POSTERS' SESSION

POSTERS' SESSION PS39
ENDOCRINE HYPERTENSION

PP.39.01 HEMORRHAGE OR RUPTURE AS COMPLICATIONS OF PHEOCHROMOCYTOMA OR FUNCTIONAL PARAGANGLIOMA

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Objective: Pheochromocytomas or functional paragangliomas may present not only with complications related to the catecholamine excess but also with local complications such hemorrhage or oven tumor rupture.

Design and method: We report about two case reports of subjects with pheochromocytoma or functional paraganglioma with local live-threatening complications

Results: First patient: Thirty five years old female had been treated for labile hypertension associated with paroxysmal headache, sweating and vomiting. Hypertension treatment was stopped six months before admission when symptoms disappeared. One month before admission, the patient started to complain of back pain, sweating and anxiety. Very intense lumbago with profuse sweating and without reaction to pain medicine led the patient to the emergency department in the local hospital. Here was found labile blood pressure with very quick fluctuations from hypotension to severe hypertension, hyperglycemia and leukocytosis. Urgent CT showed then large mass in the left adrenal gland with suspected hemorrhage. The patient was transferred to our hospital with suspected pheochromocytoma. After institution of treatment with doxazosin, the patient's condition stabilized. Laparoscopic adrenalectomy was performed the tenth day after admission without any complications. Laboratory examination showed increased levels of plasma metanephrines. Diagnosis of pheochromocytoma with extensive hemorrhage was confirmed on histopathology.
Second patient: Thirty nine years old male had been investigated for paroxysmal headache associated with blood pressure elevations, sweating, palpitations and chest pain without any conclusion. Patient's condition deteriorated rapidly after returning from the nightshift when the patient started to complain of severe headache with subsequent intense pain in the abdomen. After syncope, the patient was transferred to the local hospital. Urgently performed CT examination showed a large hematoma (20x15 cm) in the left renal region and the unconscious patient was immediately transferred to the operation room where nephrectomy, adrenalectomy, and tumor resection were performed. After the operation, the patient improved rapidly and paroxysmal symptoms disappeared. On histopathology, paraganglioma was found.

Conclusions: Beside typical cardiovascular complication of pheochromocytoma or functional paraganglioma due to catecholamine excess, the course of these tumors may be also threatened with local complications such as hemorrhage into the tumor or even tumor rupture.

PP.39.02 RS3740835 VARIANT IN KCNJ5 GENE RELATED TO THE CT SCAN-BASED ADRENAL HYPERPLASIA IN PATIENTS WITH PRIMARY ALDOSTERONISM

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Objective: As a novel candidate gene contributing to primary aldosteronism(PA), KCNJ5 gene is believed to play roles in adrenal hyperplasia. The present study aims to explore the association of variants in KCNJ5 gene with CT scan-based adrenal hyperplasia in patients with PA from Xinjiang.

Design and method: Followed the guideline of PA in 2008, a protocol for PA screening and diagnosis was performed in Center of hypertension in Xinjiang from 2008 to 2010. Finally,457 cases of subjects with confirmed PA were enrolled and were divided into adrenal hyperplasia group and control group according to the findings of thin-section CT scan. The blood samples were collected for DNA extraction and genotype identification.

Results: (1) The average level of plasma potassium in patients with adrenal hyperplasia was (3.63±0.42) mmol/L, which was significantly lower than that in controls(3.76±0.37) mmol/L with P=0.001. But the baseline plasma aldostrone level(22.78±26.52)ng/dl, urine potassium excretion (46.02±22.47) mmol/L in the adrenal hyperplasia group was higher than those in controls, which was (18.13±7.60)ng/dl, P=0.032) and (42.37±15.66) mmol/L,P=0.080). The age, mean blood pressure, body mass index, plasma sodium,urine sodium excretion as well as plasma rennin activity were matched. (2) 41.3% subjects were diagnosed as obstructive sleep apnea syndrome, 75.7% patients had hypertension history and 33.0% patients had hypokalemia history. Further, more patients with adrenal hyperplasia had hypokalemia history than that without adrenal hyperplasia (39.2% vs. 20.7%, P<0.001). The frequency of CC genotype of rs3740835 in KCNJ5 gene was higher in control group rather than that in adrenal hyperplasia group (67.7% vs.58.2%, P=0.047), though the significance only reached the boardline. (3) Logistic regression model was constructed to explore the potential factors that related to CT scan-based adrenal hyperplasia in whole study population. The results showed that the rs3740835 in KCNJ5 gene [0.642 (0.424-0.971), P=0.036] as well as plasma potassium[0.432(0.261-0.715), P=0.01] played protective roles in adrenal hyperplasia, adjusted for body mass index, gender, age.

Conclusions: The rs3740835 variants in KCNJ5 gene as well as plasma potassium levels were contributing factors to adrenal hyperplasia in patients with PA from Xinjiang.

PP.39.03 HIGH FREQUENCY OF ASC/TMS1, RASSF1A, AND P16INK4A PROMOTER METHYLATION IN SUCCINATE DEHYDROGENASE COMPLEX B AND D PHEOCHROMOCYTOMAS/PARAGANGLIOMAS

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Objective: Pheochromocytoma (PHEO) is tumor from chromaffin cells of the adrenal medulla or at extra-adrenal location - paraganglioma (PGL). The genetic basis for PHEO/PGL involves mutations of 11 genes, including SDHx (SDHB and SDHD). There is no reliable method to predict the metastatic potential of these tumors, and an answer may lie within DNA hypermethylated promoter sequences. DNA methylation is modification resulting in the addition of a methyl group at the carbon position of the CpG dinucleotides. We hypothesized hypermethylation is correlated with the more aggressive genotype, SDHx.

Design and method: In this study is sample set of 18 patients, 1 with VHL, 2 with MEN2A, 3 with SDHB, 2 with SDHD, 10 without any mutation (sporadic) and we examined the methylation status of 11 genes, which are frequently methylated in other cancers.
Analysis of promoter methylation: Sodium bisulfate modification of DNA was done with the EZ DNA methylation kit following the manufactturer's protocol. Methylation-specific PCR was done as described by Herman et. al. using primers specific for H-cadherin, ASC/TMS1, Rassf1A, p16/INK4A, HOXA9, APC, DAPK, POMC, FOX49, CDO1, and SOX17. Reaction products were separated by electrophoresis, stained with ethidium bromide and photographed.

Results: Of the patients of SDHx genotypes, 100% of tumors showed methylation in ASC/TMS1, Rassf1A, and p16. Sixty percent showed methylation for HOXA9, 40% for H-cadherin, 20% for POMC, 60% for NEFH. No tumors with MEN2A showed methylation in these genes. The VHL tumor showed methylation in Rassf1A.

Conclusions: However, evidence of hypermethylation of three genes (ASC/TMS1, p16, and Rassf1A) has now been observed within the same sample set of SDHx patients. Could they be diagnostic for SDHx PHEO/PGL and could hypermethylation be correlating with the more aggressive genotype (SDHx)? APC and CDO1, commonly methylated in other cancers, were not found to be methylated in our PHEO/PGL sample set. DNA hypermethylated promoter sequences are promising to be cancer markers and could be useful for prognosis or risk assessment, and early diagnosis.

PP.39.04 THE DIFFERENCE OF RELATIONSHIP BETWEEN SERUM ALDOSTERONE AND CENTRAL BLOOD PRESSURE IN ESSENTIAL HYPERTENSION AND PRIMARY ALDOSTERONISM

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Objective: Aldosterone is the fundamental hormone of renin-angiotensin-aldosterone system (RAS). Increasing RAS triggers not only raising blood pressure but various organ damages. However, it is difficult to evaluate tissue RAS. Especially, in primary aldosteronism patients (PA), regulation of RAS is fallen apart, and serum RAS is not always reflected tissue RAS. Recently, it is suggested that central blood pressure (CBP), directly put pressure on principal organ such as heart, can be a guide to predictor of cardiovascular events independent of brachial systolic blood pressure (SBP). In this study, we evaluate whether CBP is given to the impact by the difference of RAS activity in essential hypertension patients (EH), and whether CBP of EH is different from that of PA.

Design and method: In this study, 33 EH and 17 PA were intended. Plasma renin activity (PRA), plasma aldosterone concentration (PAC) and CBP were measured in EH who are untreated and receiving antihypertensive agents. In PA, PRA, PAC and CBP were measured at the time before and after treatment that receive eplerenone or adrenorectomy. CBP was measured using the HEM-9000AI an automated tonometer.

Results: The gap between CBP and SBP (CBP-SBP) demonstrated a tendency to be widened with increasing PAC in EH. In contrast, CBP-SBP demonstrated an adverse tendency in PA.
PA had not significant difference of SBP and CBP compared with EH, however CBP-SBP was significantly-higher with PA than EH. Increasing CBP-SBP suppressed with the treatment of adrenorectomy or medication of eplerenone.

Conclusions: It is suggested that even the slightly change of PAC, which does not occur the feedback of renin secretion, has a potential to affect CBP. Furthermore, it is also suggested that the mechanism, which is independent of serum RAS such as tissue RAS, has a potential to affect increasing CBP when the regulation of RAS is fallen apart by the oversecretion of aldosterone in PA. From this study and ASCOT-CAFÉ study, even if SBP is controlled adequate, CBP is indicated different tendency because of increasing RAS, and causes cardiovascular events higher.

PP.39.05 RENINOMA: A RARE CAUSE OF CURABLE SECONDARY ENDOCRINE HYPERTENSION

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Objective: Reninoma is a tumor arising from juxtaglomerular apparatus of kidneys, which overproduces renin leading to secondary aldosteronism, causing hypokalemia and arterial hypertension. It is a very rare disease with only tens of reported cases thorough the world.

Design and method: This is a case report concerning a 28 years old female patient which was referred to our hypertension unit by GP due to severe hypertension (BP before treatment 210/140mmHg). Hypertension was diagnosed in 2010 when patient complained of headaches, later screening of secondary hypertension at the local level revealed secondary aldosteronism.

Results: First MRI excluded renal artery stenosis in 2010. Two years later, recent MRI of adrenal glands and kidneys revealed susprisingly an ovoid intraparenchymal renal tumor 25x30mm in the lower part of the right kidney. Our laboratory testing confirmed secondary aldosteronism (supine aldosterone 318,7 ng/l, upright aldosterone 962,9 ng/l,) with an excessive (10-13 times over upper limit) increase of direct renin concentration (supine renin: 511,4 pg/ml, upright renin 496,6 pg/ml). Therefore a possible renin-producing tumour was also suspected. The patient was indicated to surgery, performed at the Department of Urology – attempt to enucleate the tumor was successful. The function and structure of the right kidney was preserved. Histological examination confirmed the clinical suspicion with diagnosis of a tumor arising from juxtaglomerular apparatus - consisting of polygonal cells with eosinophilic cytoplasm - a reninoma.
The endocrine check-up after surgery confirmed good effect of nephron-sparig surgery with preservation of function of the affected right kidney. Plasma renin, aldosterone and kalemia concentrations normalized together with normalization of blood pressure. There was no need for antihypertensive treatment anymore.

Conclusions: In conclusion, though reninoma is a rare disease, it is a well curable form of secondary endocrine hypertension. Therefore it has to be suspected in all patients with hypertension, hypokalemia with picture of secondary aldosteronism and excessive elevation of direct renin/plasma renin activity.

PP.39.06 SALINE SUPPRESSION TESTING PERFORMED IN SEATED PATIENTS IS SUPERIOR TO RECUMBENT AND COMPARABLE TO FLUDROCORTISONE SUPPRESSION TESTING IN DIAGNOSING PRIMARY ALDOSTERONISM

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Objective: Demonstrating aldosterone production which is relatively autonomous of its normal chronic regulator, angiotensin II, confirms primary aldosteronism (PA). This is done by demonstrating lack of aldosterone suppression when plasma renin has been suppressed by sodium loading manoeuvers such as fludrocortisone suppression testing (FST) and saline suppression testing (SST). We have previously found recumbent SST to lack sensitivity.

Design and method: Of 65 patients who underwent FST (plasma aldosterone measured at 10am after 2-3h upright posture basally and after 4 days administration of fludrocortisone 0.1mg 6 hourly and oral salt loading) between April 2012 and November 2013, 31 agreed to participate in the study and underwent SST (aldosterone measured basally at 8am and at completion of an infusion of 2L normal saline over 4 h) both (1) recumbent (infusion commenced 30min after assuming recumbency) and (2) seated, with SSTs spaced at least 2 weeks apart, and in randomised order.

Results: FST confirmed PA (day 4 upright aldosterone >165 pmol/L) in 24 of 31 patients (10 were posture-unresponsive ("U") and 14 were responsive ("R"), excluded PA in 3 and was inconclusive in 5 (one of whom subsequently lateralised on adrenal venous sampling, confirming PA). Of the 24 with confirmed PA (8 unilateral, 11 bilateral and 5 undetermined subtype), 23 tested positive (plasma aldosterone >165 pmol/L at 4h) by seated SST. Recumbent SST was positive (plasma aldosterone >140 pmol/L at 4h) in only 7 of the 24, missing one with unilateral, all 11 bilateral and 4 with undetermined subtype of PA. All 3 patients without PA (FST negative) tested negative by seated and recumbent SST. Seated SST was positive for all 10 "U" (100%) and for 13 of 14 "R" (92.9%). Recumbent SST was positive in 7 of the 10 "U" (70%) and only 1 of the 14 "R" (7.1%). The difference in these positive percentages was highly significant ($P < 0.005$).

Conclusions: Seated SST is superior to recumbent SST in detecting PA, especially in patients with posture-responsive forms, and may be a reliable alternative to FST.

PP.39.07 INFLAMMATORY MARKERS IN PRIMARY ALDOSTERONISM

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Objective: Primary aldosteronism (PA) characterized by an autonomous overproduction of aldosterone is the most common cause of endocrine hypertension with a high frequency of cardiovascular complications. The unfavorable cardiometabolic profile may be due to aldosterone-mediated activation of inflammatory cells, circulatory cytokines and activation of collagen synthesis in the vessel wall.

Design and method: Aim of our study was to evaluate differences in the levels of hsCRP, IL-6, TNF-α and the N-terminal propeptide of collagen I (PINP) in patients with PA and essential hypertension (EH) and between the most common subtypes of PA- aldosterone producing adenoma (APA) vs. idiopathic hyperaldosteronism (IHA). We studied 28 patients with PA and 29 matched patients with EH. From the PA group 10 patients had IHA and 12 patients APA, 6 remained unclassified. Criteria for subtype specification were selective adrenal venous sampling or adrenalectomy with histological verification of the adenoma and normalization of hormonal parameters afterwards.

Results: There were no differences in the levels of inflammatory markers between EH and PA [TNF-α (5.51±0.43 vs. 5.82±0.66), IL-6 (0.89±0.06 vs. 1.19±0.15), hsCRP (1.13±0.25 vs. 0.68±0.17), leukocytes (6.35±1.56 vs. 6.01±1.26)] and between APA and IHA [TNF-α (5.22±0.69 vs. 4.9±0.38), IL-6 (1.02±0.18 vs. 0.96±0.14), hsCRP (0.41±0.06 vs. 1.17±0.42), leukocytes

(6.37±1.41 vs. 5.71±1.21)]. Basal cortisol levels were not statistically different between PA and EH patients but were significantly different among patients with APA and IHA (435.3±28.3 vs. 615.4±40.5, p<= 0.002), no differences in urine cortisol or short dexametasone test were found. Significant differences were in the levels of PINP between PA and EH (53.03±30.89 vs. 35.77±12.34, p<= 0.007); there were no significant differences in PINP levels between APA and IHA.

Table 1

Variable	n	EH	n	PA	p
Leukocytes, 10^9/l	29	6.35 ± 1.56	28	6.01 ± 1.26	NS
Neutrophils, 10^9/l	29	3.57 ± 1.25	28	3.55 ± 1.03	NS
Lymphocytes, 10^9/l	29	1.99 ± 0.57	28	1.77 ± 0.45	NS
Monocytes, 10^9/l	29	0.54 ± 0.15	28	0.47 ± 0.13	NS
hsCRP, mg/l	29	1.13 ± 0.25	28	0.68 ± 0.17	NS
IL-6, pg/ml	29	0.89 ± 0.06	28	1.19 ± 0.15	NS
TNF-α, pg/ml	29	5.51 ± 0.43	27	5.82 ± 0.66	NS
PINP, ug/l	29	35.77 ± 12.34	28	53.03 ± 30.89	0.007
Basal cortisol levels, nmol/l	29	553.9 ± 151.2	25	506.7 ± 154.1	NS

Table 2

Variable	n	APA	n	IHA	p
Leukocytes, 10^9/l	12	6.37 ± 1.41	10	5.71 ± 1.21	NS
Neutrophils, 10^9/l	12	3.78 ± 0.98	10	3.31 ± 1.2	NS
Lymphocytes, 10^9/l	12	1.83 ± 0.51	10	1.79 ± 0.47	NS
Monocytes, 10^9/l	12	0.47 ± 0.14	10	0.48 ± 0.14	NS
hsCRP, mg/l	12	0.41 ± 0.06	10	1.17 ± 0.42	NS
IL-6, pg/ml	12	1.02 ± 0.18	10	0.96 ± 0.14	NS
TNF-α, pg/ml	12	5.22 ± 0.69	9	4.9 ± 0.38	NS
PINP, ug/l	12	58.23 ± 12.35	10	52.61 ± 6.16	NS
Basal cortisol levels, nmol/l	11	435.3 ± 28.3	8	615.4 ± 40.5	0.002

Conclusions: We did not find any differences in circulating levels of inflammatory markers (TNF-α, IL-6, hsCRP and leukocytes) between EH and PA but we observed higher levels of N-terminal propeptide of collagen I in patients with PA. The subgroups of PA do not differ in levels of inflammatory markers or PINP, but patients with IHA have significantly higher levels of basal morning cortisol.

PP.39.08 ATTENUATION OF GENE EXPRESSION OF G PROTEIN-COUPLED ESTROGEN RECEPTOR 1 (GPER1) IN PERIPHERAL BLOOD MONONUCLEAR CELLS FROM POSTMENOPAUSAL PATIENTS WITH HYPERTENSION

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Objective: We tested the hypothesis that the possible changes in relative gene expression of G protein-coupled estrogen receptor 1 (GPER1) in peripheral blood mononuclear cells (PBMC) may be important in pathogenesis and treatment of patients with hypertension in late postmenopausal period.

Design and method: This study evaluated the level of GPER1 relative gene expression in peripheral blood mononuclearcells (PBMC) of 71 postmenopausal patients with hypertension and 31 women without hypertension as a control by real-timePCR. The ages of the patients were from 60 to 83, with the average 69±1 year. The blood samples were taken from medium cubital vein. The PBMC separation was down according by Boyum method of centrifugation on Ficoll gradient. The mRNA preparation from PBMC was down by using AmpliSens® Ribo-prepkit (Central Research Institute of Epidemiology, Russia).The cDNA was generated by using AmpliSens® Reverta-L. The RT-PCR was down on iCycler iQ5 real-time PCR with the Sybr Green qPCR Master Mix(BioRad, Germany) and specific primers (Sintol, Russia): GPER1: up - agggacaagctgaggctgta, low - gtctacacggcact-gctgaa. For estimation the mRNA copy number ΔCt-method was used ΔCt = Ct(gene) - Ct(GAPDH), data presented in 1/2^ΔCt.

Results: The development of hypertension is accompanied by decrease of relative gene expression of membrane associated estradiol receptor GPER1 in PBMC from patients in late postmenopausal period - 2.18 ± 0.33 vs control group - 4.99 ± 1.00(p = 0,005). This decrease (more than twice time) in GPER1 gene expression could be an indicator of profound alteration and could be more significant than attenuation of PR-A and ER-b receptor gene expression as we have shown before. Studies demonstrate direct effects of sex hormones on immunocompetent cells.

Conclusions: With the development of hypertension the steroidal control of the immune system and the endothelia function are changing. The impact of this change in pathogenesis of hypertension need to be further investigated. The level of GPER1 gen expression in PBMC from patients in late postmenopausal period could reflect severity of hypertension and serve as pathogenic ground for choosing appropriate treatment for patients with hypertension.

PP.39.09 MELATONIN SECRETION IN PATIENTS WITH BREAST CANCER ASSOCIATED WITH PRIMARY HYPERTENSION

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Objective: A number of experimental studies showed that melatonin, the main hormone of the pineal gland, exhibits chronobiological, anticancer and antihypertensive effects. It has been also known that endogenous lithium has similar chronobiological effect. The study was aimed to estimate melatonin secretion and serum levels of endogenous lithium in patients with breast cancer and concomitant primary arterial hypertension.

Design and method: A total of 18 patients (aged from 37 to 64 years) with breast cancer and concomitant primary arterial hypertension (stage I by Joint National Committee) were studied. Control group was represented by 16 patients (aged from 34 to 69 years) with the same stage of breast cancer. Plasma levels of melatonin were estimated by liquid chromatography, serum levels of endogenous lithium were determined by atomic absorption spectroscopy.

Results: Our results showed that plasma melatonin levels in patients with concomitant hypertension was almost 20 times lower (0.11 ± 0.06 pcg/ml) than in control group (2.3 ± 0,38 pcg/ml, p<0,01). While serum level of endogenous lithium in patients from control group (0,8 ± 0,03 mmol/l) was within the normal range (0,5 - 1,2 mmol/l), its serum level in patients with both cancer and hypertension was about ten times lower (0,07 ± 0,03 mmol/l, p<0,001).

Conclusions: Melatonin plasma levels and serum concentration of endogenous lithium significantly decrease in patients with breast cancer and arterial hypertension. Taking into consideration that both melatonin and endogenous lithium are chronobiologically active substances, we suggest that disturbances in circadian rhythm might contribute to the pathogenesis of arterial hypertension in patients with breast cancer.

PP.39.10 SYMPATHETIC AND METABOLIC EFFECTS OF SURGICAL REMOVAL OF ADENOMAS IN ACROMEGALIC PATIENTS: MICRONEUROGRAPHIC EVIDENCE

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Objective: It has been previously shown that patients with early stage of acromegaly, not accompanied by organ damage, are characterized by a profound sympathoinhibition coupled with low leptin plasma levels. Whether the surgical removal of the adenoma is able to restore the adrenergic drive and correct the metabolic alterations is unknown.

Design and method: Sympathetic tone has been directly recorded to the skeletal muscle through the microneurographic technique (MSNA) in: a) 15 acromegalic patients (3 micro-, 12 macro-adenomas) in the early stage of this pathology (ACRO; age 46.6±10.3.0 years, media±SD) before and after surgery; b) 17 healthy subjects (C; age 49.1±15.6 yrs). The protocol included anthropometric, haemodynamic, echocardiographic, metabolic, humoral, blood pressure, and heart rate values before and after surgical removal of adenomas while in C data were collected only in basal conditions.

Results: Compared to C, ACRO were characterized by insulin resistance (HOMA: 1.57±0.3 vs 4.08±2.2 a.u., p<0.01) and by a significant reduction in plasma leptin (6.42±2.0 vs 1.62±1.0 µg/l, p<0.01) and MSNA (37.8±6. vs 17.7±7.7 bursts/min, p<0.01) values without any organ damage and significant changes on fat and muscle mass or water content assessed via electric impedance. After surgical removal of adenomas ACRO showed a normalization of IGF-1 and this was accompanied by a significant (p<0.01 for all) improvement in HOMA index (2.2±0.6 a.u.), in plasma leptin levels (6.0±2.6 µg/l) and in MSNA (30.1±3.2 bursts/min). No changes were observed in anthropometric, haemodynamic, echocardiographic, and electric impedance parameters. In the population as a whole we osserved a significant direct correlation between MSNA and plasma leptin levels (r=0.38, P<0.01) and an inverse correlation between leptin and IGF-1 (r=0.47, P<0.01).

Conclusions: The study shows for the first time that surgical removal of adenomas is able to almost completely normalize the MSNA and the metabolic alterations associated with the increase in GH and IGF-1 levels. The study provides also additional evidence that in the early stage of the disease plasma leptin levels may have a major role in the sympathoinhibition more than reflex influences induced by changes in water content not present in this phase.

PP.39.11 RENAL SYMPATHETIC NERVE ACTIVITY MEDIATES ALTERED NA+ HANDLING AND HYPERTENSION SECONDARY TO NEONATAL HYPERLEPTINAEMIA

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Objective: Maternal obesity in rodents leads to sympathetic mediated hypertension in the juvenile offspring and hyperphagia and increased adiposity in adulthood. This is associated with an exaggerated leptin surge in early postnatal life. We have investigated the origin of hypertension in neonatal hyperleptinaemic mice, including the mechanisms that lead to dysfunctions of the kidneys.

Design and method: Wistar rats were injected with leptin (L-Tx, 3 mg/kg, ip) twice daily at postnatal day (PD) 9-14, to mimic the exaggerated leptin surge in neonatal offspring of obese dams, versus saline treated (S-Tx). At 30 days of age, rats were subjected to telemetry surgery and after 7 days of baseline recordings divided into (1) a renal denervation (RD) group and (2) a sham operation group (SH) to examine the effects of RD on blood pressure, heart rate, renal function (creatinine clearance), and tissue analysis of renal sodium retention markers. Bilateral renal denervation was performed in anesthesised rats. Kidney was exposed using a retractor and renal nerves were cut and painted with 10% phenol. Renal denervation was then confirmed by measure renal tissue norepinephrine content (< 10% of SH group). Renal tyrosine hydroxylase (TH), expression of AT1aR (type -1a ang II receptors), AT2R (type -2 ang II receptors), ACE (angiotensin converting enzyme), NHE3 (Na-H exchanger 3), and NCC (Na-Cl cotransporter) were examined.

Results: At 30 days of age, neonatal leptin rats demonstrated increased blood pressure, renal angiotensin system and sodium retention with decreased creatinine clearance [GFR, ml/min/kg, L-Tx, 2.8±0.1 vs. S-Tx, 3.5±0.2, n=6, p<0.05]. Seven days after renal denervation (RD) L-Tx rats showed reduced blood pressure compared to sham operated [night MAP, mmHg L-Tx-RD, 102±1.3 vs L-Tx-SH, 120± 2.5, n=6, p<0.05) with normalised NHE3 mRNA expression and improved the renal function.

Conclusions: Renal denervation seems to be a useful therapeutic strategy to improve the sodium handling in the kidney which reset the tubular functions in neonatal leptin mice which may underpin the development of hypertension and renal dysfunction.

PP.39.12 RELATIONSHIP BETWEEN BIOCHEMICAL PROFILE OF PHEOCHROMOCYTOMA, BLOOD PRESSURE PROFILE AND LEFT VENTRICULAR STRUCTURE AND FUNCTION. PMT-CARDIO

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Objective: To evaluate the relationship between biochemical profile of pheochromocytoma, blood pressure profile and left ventricular structure and function.

Design and method: In an ongoing PMT-Cardio program we evaluated 56 patients with pheochromocytoma (mean age 48±14 years, 29 F, 27 M) and 30 age, gender, BMI and office blood pressure levels matched patients with essential hypertension (HTN) (mean age 45±13, 15 F 15 M). In all patients evaluation of plasma free normetanephrine (NMN) and metanephrine (MN) concentrations by LC-MS/MS was performed. Patients with pheochromocytoma were divided into 2 groups: 22 patients with a predominantly norepinephrine-producing tumor (group NE) and 34 patients with a predominantly epinephrine-producing tumor (group EPI). 24-h ambulatory blood pressure (ABP) monitoring was performed. Nighttime BP decline was calculated and expressed as percentage. Echocardiography and tissue Doppler imaging were used to assess the following cardiac parameters: left ventricular hypertrophy (LVH), concentric remodeling (RWT>0,45), E' velocity, E/E' index and global longitudinal strain (GLS).

Results: There was no difference in daytime ABP levels between the groups. Patients in the group NE were characterized by higher nighttime systolic and diastolic ABP levels as compared both with patients in the EPI and HTN groups. Patients in the NE group were characterized also by less pronounced nighttime systolic and diastolic ABP decline as compared with EPI and HTN groups (-5/-9% vs -7/-14% and -11/-15% for systolic and diastolic ABP respectively; p=0.089/p=0.034 and p=0.015/p=0.015). Plasma free NMN significantly correlated with nighttime ABP levels. Patients in the EPI group were characterized by higher frequency of LVH and concentric remodeling (44,1 and 50%) as compared with NE (9,1 and 31,8%; p=0.005 and p=0.14) and HTN group (16.7 and 30%; p=0.018 and p=0.085). There was a tendency towards lower GLS and E' velocity in the group EPI as compared with HTN group.

Conclusions: Our preliminary results show that the biochemical profile of pheochromocytoma might affect blood pressure profile and left ventricular structure.

PP.39.13 A RARE CAUSE OF SEVERE HYPERTENSION IN THE TWENTIES: CASE REPORT

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Objective: We present a case of a 21-year old woman with no past medical history who was admitted to our private consultation with a recently, and incidentally, diagnosed severe hypertension [180/120 mmHg systolic/diastolic blood pressure].

Design and method: The patient presented with sinus tachycardia, headache and tremor. The laboratory investigation demonstrated both elevated plasma norepinephrine (1910 pg/ml) and epinephrine (1780 pg/ml) and 24h urinary free catecholamines (790 µg/24h).
Method: These data made the diagnosis of a catecholamine producing tumor highly probable. The complementary exams, such as the magnetic resonance imaging of the abdomen showed normal adrenal glands, but it also revealed a mass (3.6x3.1 cm) anterior to the inferior vena cava.

Results: As no scintigraphy exists in our island, the patient was sent to the mainland, where the diagnosis of paraganglioma was confirmed by meta- iodobenzylguanidine scintigraphy. After a prompt admission the patient started on preoperatively, α- and β-adrenergic receptor blocker. The resection of the tumor occurred with uneventful episodes and soon after the patient's blood pressure was restored to normal. The three month follow up revealed a stable blood pressure with a plasma and 24h urinary catecholamine levels close to normal.

Conclusions: In conclusion, in a young patient the measure of blood pressure should take place in early twentie's and if high possible causes for secondary hypertension must be ruled out. The paragangliomas are a rare but possible cause of secondary hypertension and need to be thought of, diagnosed and treated as described above, since surgical removal of the tumor, especially in sporadic cases, may cure the patient.

PP.39.14 PRIMARY ALDOSTERONISM AND HYPERPARATHYROIDISM: THEY DO COEXIST!

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Objective: Different disorders of endocrine system may coexist in some syndromes like MEN1 and MEN2. In some cases the coexistence of glands disorders cannot be classified in any syndrome. Primary aldosteronism and hyperparathyroidism have been rarely diagnosed in patients simultaneously.

Design and method: Motivated by this, we present the rare case of a 47 year old man with no family history, who presented in our Clinical Outpatient Centre with dysregulated blood pressure (182/120 mmHg). He has been suffering from hypertension for 16 years and has been treated with a-blocker, calcium blocker and nitrates.

Results: Blood tests revealed hypokalaemia, hypercalcaemia, normal phosphorus levels, third degree renal failure (GFR: 45.4 ml/min/1.73m2) and anemia (attributed to renal failure). U waves were noted in V2 to V4 ECG leads. A computed tomography scan evidenced a 5.5 mm diameter adrenocortical nodule. Plasma aldosterone concentration was elevated (23.8 ng/dl), plasma renin activity was suppressed (0.26 ng/ml/h) and aldosterone–renin ratio was markedly elevated (91.5). Saline loading and Fludrocortisone suppression test led to the diagnosis of primary aldosteronism (cortisol and dehydroepiandrosterone

were in normal rates). In the beginning spironolactone was prescribed resulting in a significant fall of blood pressure.
The intact parathyroid hormone was very high (295 pg/ml). Cervical MRI scan was normal but a Tc-Sestamibi scan revealed a nodule of parathyroid, which was surgically excised. After the operation a further fall of blood pressure was noted.

Conclusions: Hence, we must keep in mind the possibility of coexistence of primary aldosteronism and hyperparathyroidism in patients with high blood pressure, hypokalaemia and hypercalcaemia. The majority of experimental animal and clinical studies support a clinically relevant interplay between aldosterone and parathormone levels. Much must be learned between these two hormones and receptors in target tissues in order to prevent the vicious circle between them and consecutive cardiovascular damage.

PP.39.15 LONG-TERM CARDIO- AND CEREBROVASCULAR EVENTS IN PATIENTS WITH PRIMARY ALDOSTERONISM

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Objective: Aldosterone producing adenoma (APA) and bilateral adrenal hyperplasia (BAH) are the two most common subtypes of primary aldosteronism (PA). PA patients display an increased risk of organ damage compared to essential hypertensives (EH) with similar blood pressure and risk profiles.

Design and method: We retrospectively compared the percentage of patients experiencing events at baseline and during a median follow-up of 12 years in 270 PA patients case-control matched 1:3 with EH patients and in PA subtypes vs matched EH.

Results: During the total period of follow up 22.6% of PA patients experienced events, compared to 12.7% of EH. At diagnosis of PA a higher number of patients had experienced events compared to EH (14.1% vs 8.4%), and also during the follow-up period (8.5% vs 4.3%). The analysis of event subtypes showed an increased prevalence of arrhythmias, stroke and HF during the total period of the study. Interestingly, during the follow-up after diagnosis of PA, only HF was more frequent in PA compared to EH. Moreover, during the follow up period, a higher percentage of PA patients developed type II diabetes mellitus compared to matched EH. Age, duration of hypertension, systolic blood pressure, presence of diabetes mellitus and PA diagnosis were independently associated with the occurrence of all events. Patients with APA displayed a higher rate of events compared to BAH patients both in the total period of the study and at diagnosis of PA, but not during the follow- up after diagnosis. A significantly higher number of APA patients had a cardiovascular event during the study and at diagnosis of PA but not during the follow-up period subsequent to PA diagnosis. BAH patients displayed a higher rate of events during the study period compared to EH, but this difference was predominantly due to an increased rate of events during the follow-up after the diagnosis of PA compared to the rate of events at diagnosis.

Conclusions: This study demonstrate the pathogenetic role of aldosterone excess in the cardiovascular system and thus the importance of early diagnosis and targeted PA treatment.

PP.39.16 CHANGES OF CARDIOVASCULAR DISEASE PARAMETERS IN PATIENTS WITH ACROMEGARY AFTER TRANSSPHENODIAL SURGERY

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Objective: Several studies have reported that patients with acromegaly have increased risk of cardiovascular disease (CVD), resulting from multiple cardiovascular risk factors. It has been reported that various laboratory parameters of CVD are associated with acromegary. However, there are few reports which compared many laboratory parameters of CVD on same acromegary patient before and after transsphenodial surgery (TSS). Purpose of this study is to investigate which laboratory parameter of CVD more correlates with acromegary patients before and after surgery.

Design and method: We performed a retrospective study to investigate the correlation between acromegary and various laboratory parameters of CVD. All 24 patients performed cardio-ankle vascular index (CAVI) and brachial-ankle pulse wave velocity (baPWV), which reflects arterial stiffness before and less than one year after surgery. Echocardiographic measurements and other biochemical parameters were also examined.

Results: Growth hormone (GH) ($p<0.0001$), insulin-like growth factor (IGF)-1 ($p<0.0001$), IGF-1 standard deviation score (SD) ($p<0.0001$), systolic blood pressure (SBP) ($P=0.0232$) diastolic blood pressure (DBP) ($P=0.0132$), the ratio of early diastolic mitral flow velocity to peak early diastolic mitral annular verocity (E/E') ($p=0.007$), hemoglobin A1c(HbA1c) ($p<0.0001$) and triglycerides(TG) ($p<0.0001$) decreased significantly after surgery. High density lipoprotein cholesterol (HDL) ($p=0.0006$) increased significantly after surgery. Instead of significant correlation between CAVI and baPWV, only CAVI levels increased significantly after surgery ($P=0.0232$). We also examined the correlation between changes of hormones and CVD parameters. Only changes of SD correlated with changes of baPWV. Changes of baPWV also correlated with changes of SBP, DBP and CAVI.

Conclusions: In this study, value of CAVI as well as GH, IGF-1, SD, SBP, DBP, E/E', HbA1c, TG and HDL changed significantly before and after TSS. CAVI was changed without relation to other parameters after surgery. Although both baPWV and CAVI are parameters of arterial stiffness, results of two analyses differed. baPWV may be easily affected by parameters of blood pressure. It is suggested that CAVI may be superior to baPWV as parameter of arterial stiffness in patients with acromegary after TSS.

PP.39.17 EFFECT OF AGE ON PRIMARY ALDOSTERONISM SCREENING

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Objective: The aldosterone/renin ratio (ARR) is the most reliable screening test for primary aldosteronism (PA), but false positives often occur in greater age. The purpose of this study is to investigate the effect of age on plasma renin activity(PRA), plasma aldosterone concentration(PAC) and ARR in PA identification.

Design and method: We recruited 230 in-patients with PA and 221 in-patients with essential hypertension(EH) of the center of hypertension in People's Hospital of Xinjiang. All subjects were asked to cease common antihypertensive medications which may affect the ARR at least 4 weeks before testing for ARR. We adopt midmorning seated sample for ARR testing and saline infusion as confirmatory test. Levels of PRA, PAC and ARR were compared at four ages range groups (age<40years, 40–49years,50–59years, and >or=60 years).

Results: (1) 45.2% patients was in 40-49 years old in PA group and 37.8% in EH group. Patients over 60 years were common in PA group (11.8%). (2) No significant difference of PRA, PAC and ARR was found in different age groups in patients with PA. (3)In patients older than 60 years, there was no significant difference of PRA between PA and EH group, but the level of aldosterone was significantly different. (4)In EH group, PRA of patients over 60 years old was significantly lower than that of patients under 40 years old ($P<0.01$). ARR of patients over 60 years old was significantly higher than patients under 40 years old and from 50 to 59 years old ($P<0.05$). (5) With advancing age, the screening accuracy of ARR was decreased, the optimal cutoff value of ARR in diagnosis for PA was increased. In the patients older than 60 years, the optimal cutoff value of ARR in diagnosis for PA was 40.0 calculated from ROC, area AUC was 0.88.

Conclusions: Our data suggest that an ARR >or= 40 strongly indicates PA in the patients older than 60 years. As a result of low rennin levels, the cutoff value of ARR in diagnosis for PA was increased with greater age, saline infusion as a confirmatory test is particularly important for this population.

PP.39.18 HYPERTENSION AND HYPOTHYROIDISM IN PATIENTS WITH METABOLIC SYNDROME

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Objective: The combination of a metabolic syndrome and hypothyroidism progressively increases risk development of cardiovascular diseases in patients with hypertension, abdominal obesity.

Design and method: 193 women who have made 2 clinical groups are surveyed: 1 group 95 patients (53,2± 1,8 years) with hypertension, abdominal obesity and hypothyroidism (TSH 11,5 ± 2,3 IU /ml, FT4 0,35 ±0,2 ng/ml); 2 group 98 patients (middle age 55,2± 2,1 years) with hypertension, abdominal obesity and euthyroid function (TSH 3,3 ± 0,5 IU/ml, FT4 0,8 ± 0,1 ng/ml). All researched carried out measurement waist circumference (WC), blood pressure

(BP) and the 24-hour BP monitoring, echocardiography, fast levels of glucose, insulin and lipids levels. Insulin sensitivity was estimated homeostasis model assessment (HOMA) method. The insulin resistance was diagnosed at increase of the HOMA>2,7.

Results: It is marked, that patients of 1 group had authentically , smaller displays of abdominal obesity (WC 112,3 ±2,7 sm) in comparison with 2 group (WC 93,2 ±2,2 sm) though parameters of bodymass index in both groups did not differ (34,9± 1,1 and 32,1 ±1,1 accordingly). In 1 group with diastolic hypertension (152/112mm Hg). In 2 group with hypertension (146/85mm Hg). In 1 group it has not been revealed changes of fast levels of glucose (5,5 ± 0,2 mmol/l) and attributes of the insulin resistance (HOMA 3,4± 0,3),that distinguished them from patients of 2 groups (HOMA 2,3 ± 0,2). Distinctive feature of 1 group was authentic higher in comparison to 2 group a parameter of the triglycerides (TG) levels (2,5 ±0,4 mmol/l).

Conclusions: It is established, that manifestation of metabolic syndrome in patients with hypertension, abdominal obesity and hypothyroidism it is accompanied with diastolic hypertension, by more expressed lipids disorders and changes of hemodynamic parameters of the left atrium and ventriculumr, but more favorable type of obesity and absence of impairments a carbohydrate metabolism.

PP.39.19 ADRENALECTOMY REVERSE THE IMPAIRED HEART RHYTHM COMPLEXITY IN PATIENTS WITH PRIMARY ALDOSTERONISM

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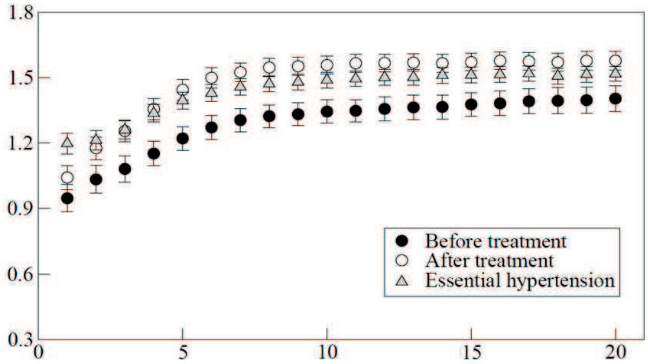
Objective: Primary aldosteronism (PA) is a common, curable hypertensive disease with a prevalence of 5-10% in hypertensive population. Compared to essential hypertensive (EH) patients, PA patients have higher prevalence of cardiovascular disease and arrhythmia. Heart rhythm complexity is a powerful tool in outcome prediction of patients with cardiovascular diseases. Our objective was to investigate heart rhythm complexity in PA patients and its change after surgery.

Design and method: We prospectively analyzed 20 patients with aldosterone producing adenoma (APA) that received adrenalectomy from December 2006 to October 2008, and 25 patients with essential hypertension (EH) were enrolled as the control group. Holter were performed in both groups and one year after operation in the APA group. Heart rhythm complexity including detrended fluctuation analysis (DFA) and multiscale entropy (MSE) were performed.

Results: APA patients had significantly decreased DFAα2 in DFA study; area 1-5, area 6-15, area 6-20 in MSE study (all p< 0.05). In correlation study, area 1-5, area 6-15, area 6-20 in MSE study were correlated significantly with log-transformed aldosterone concentration and log-transformed aldosterone-renin ratio. After adrenalectomy, all the altered parameters in MSE study and DFAα2 improved significantly (all p<0.05). The MSE studies of EH, APA before surgery, and APA after surgery were showed in figure 1.



Conclusions: Heart rhythm complexity is altered in APA patients and is reversed by adrenalectomy.

PP.39.20 HYPERFILTRATION IS ASSOCIATED WITH IMPAIRED RENAL FUNCTION AFTER TREATMENT OF PRIMARY ALDOSTERONISM

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Objective: Treatment of primary aldosteronism (PA) by adrenalectomy or spironolactone often results in a decline of renal function. This may be explained by reversal of hyperfiltration caused by PA. The goal of this study is to assess the risk factors associated with renal impairment after treatment of PA. In addition to factors suggested in the literature, we studied the influence of hyperfiltration in particular.

Design and method: We recorded retrospectively clinical characteristics and estimated GFR (eGFR, calculated using the CKD-EPI formula) of 149 PA patients before treatment and six months after adrenalectomy or start of spironolactone. Using multiple regression analysis, we assessed determinants for renal function after treatment (defined as eGFR at six months after treatment). We assumed hyperfiltration to equal eGFR decline after treatment (=eGFR before treatment – eGFR at six months after start of treatment).

Results: Renal function declined after treatment by 13,63 ml/min (range, -19–63; median, 11,50). Intrinsic or obstructive renal disease as a cause of decline was ruled out by urinalysis and renal ultrasound. Independent predictors of eGFR decline after treatment (=hyperfiltration) were pretreatment plasma aldosterone level (P<.001), estimated duration of hypertension (P=.009), baseline eGFR (P=.001), pretreatment plasma renin level (P=.012) and pretreatment plasma potassium (P=.005). Independent determinants of absolute eGFR after treatment were degree of hyperfiltration (P<.001), age (P<.001) and mean arterial pressure (P=.009).

Conclusions: Hyperfiltration is inversely related to renal function after treatment of PA. Patients with the worst residual kidney function after treatment have the highest degree of hyperfiltration before treatment.This suggests that aldosterone increases the filtration fraction and glomerular capillary pressure even in the presence of structural kidney damage. From our data we cannot conclude whether this structural damage is due to hyperfiltration, or due to a direct effect of aldosterone.

PP.39.21 CLINICAL SIGNIFICANCE OF PATIENTS WITH HYPERKALEMIA AFTER ADRENALECTOMY IN PRIMARY ALDOSTERONISM

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Objective: In patients with primary aldosteronism (PA), surgical treatment usually makes serum potassium (K) elevate relatively to normal range as compared with untreated period. In minority cases, moreover, we experience hyperkalemia requires medical treatment occurs after adrenalectomy. Although postoperative hypoaldsoteronism is previously reported as a contributor of this phenomenon, the mechanism is still unclear. New information about initial clinical significance and contributors of postoperative hyperkalemia is required to be aware of this crucial complication.

Design and method: All 116 patients participated in this study were treated and diagnosed as aldosterone producing adenoma (APA) in Tohoku University Hospital. Hyperkalemia was defined as more than 5.1mM in serum K. Mineralocorticoide receptor antagonists (MRA) were administrated to all patients after diagnosis of lateralityand the doses were adjusted to normalize serum K before adrenalectomy. Sufficient hydration of ECF were performed during operative periods for avoiding acute kidney injury (AKI) and hyperkalemia after adrenalectomy. We analyzed to investigate the contributor for elevated serum K and hyperkalemia after adrenalectomy.

Results: No patients became AKI and required hemodialysis. Initial eGFR, urinary albumin (UACR), β2microglobulin and renal resistive index (RI) were significantly correlated with postoperative serum K (maximum value), respectively. The value of elevated serum K after adrenalectomy were significantly correlated with decreased eGFR and aldosterone. Hyperkalemia was occurred in twenty-eight patients. 18 of them showed temporally (5.4mM) (Day 28th, mean value) (T-group) and rest of them did persistently (5.9mM) (Day 495th) (P-group). Clinical significance of T-group showed lower level of initial eGFR (71 ml/min/1.73m²) and higher level of UACR (70mg/gCre) as compared with normoK-group (n=88). Elevated serum K, which significantly correlated with decrement of eGFR, was immediately and spontaneously recovered as normal range. In the meanwhile, those of P-group showed initial complication of severe renal damage (47 in eGFR, 111 in UACR, 0.70 in RI), hyperaldosteronism with elevated renin activity, aged and long-duration of exposed hypertension. Among them, no one required fludrocortisone therapy for hyperkalemia after adrenalectomy, although 3 were medically treated (diuretics and polystyrene sulfonate).

Conclusions: APA patients initially complicated with renal damage should be treated carefully for hyperkalemia after surgery.

PP.39.22 LONG-TERM EFFECTS OF ADRENALECTOMY OR SPIRONOLACTONE ON BLOOD PRESSURE CONTROL AND REGRESSION OF LEFT VENTRICLE HYPERTROPHY IN PATIENTS WITH PRIMARY ALDOSTERONISM

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Objective: Primary aldosteronism (PA) represents the most common reason of secondary hypertesion. Beyond increased blood pressure, additional harmful effects of aldosterone excess on the heart including myocardial fibrosis, enlargement of left ventricle (LV) cavity and inappropriate LV hypertrophy were found. However, whether these myocardial changes could be reversed by specific therapy in long-term, remains uncertain. In this study, we evaluated the effect of adrenalectomy and spironolactone on blood pressure and myocardial remodeling in long-term follow-up.

Design and method: A total of 31 patients with PA were prospectively recruited in long-term follow-up study. Of them, 15 patients with confirmed aldosterone producing adenoma underwent adrenalectomy, in remaining 16 patients, conservative treatment with spironolactone was initiated. Laboratory data, 24h ABPM and echocardiography parameters were evaluated at the baseline and at a median follow-up of 64 months.

Results: Both surgical and conservative approach reduced blood pressure to similar levels (to 127±12/78±8 mmHg in adrenalectomized and 128±11/81±7 mmHg on spironolactone, p=0.001 vs. baseline). In both groups we observed significant decrease in both end-diastolic (p=0.04, p=0.01) and end-systolic LV cavity diameters (p=0.03, p=0.01). Interventricular septum thickness reduction was apparent only in patients after adrenalectomy (p=0.01) as well as a drop in posterior wall thickness (p=0.03). Reduction in LV mass index was significant only after adrenalectomy (p=0.004). A trend to lower LV mass after spironolactone treatment was caused predominantly by diminution of LV cavity, which reflected also in the increase of relative wall thickness (p=0.05)

Conclusions: Although both surgical and conservative treatment can induce long-term decrease of blood pressure in patients with PA, adrenalectomy seems to be more effective in reduction of LV mass, as it reverses both wall thickening and enlargement of LV cavity diameters. Spironolactone treatment lead only to reduction of the size of LV cavity with no observed effect on wall thickness. This insufficient effect shows the possible harmful influence of persistent hyperaldosteronaemia, however the mechanisms remain unclear and desrve further investigation.

PP.39.23 RELIABILITY OF A BAYESIAN NETWORK TO PREDICT PRIMARY ALDOSTERONISM

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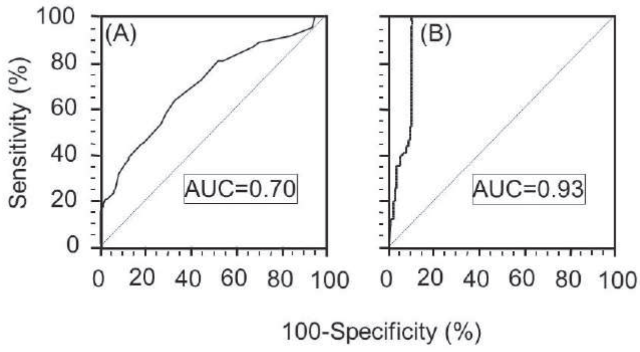
Objective: To improve selection of patient at risk of primary aldosteronism (PA) that remains difficult because it takes into account numerous variables with complex interactions.

Design and method: From five French "European excellence hypertension centers" institutional registers, data of consecutive patients referred between the first june 2008 and the 30 may 2009 were retrospectively collected. Patients were included if they had at least one of the following criteria: onset of hypertension before 40 years (55%), resistant hypertension (44%), history of hypokaliemia (38%), treatment by spironolactone (15%), and potassium supplementation (11%). Diagnosis of biological PA was based on an aldosterone-to-renin ratio>32 (ng/l)/(ng/l) in patients treated without agents altering the renin-angiotensin system. Bayesian network and stepwise logistic regression were used to predict a PA.



Receiver-operating-characteristic curve for PA probability using logistic regression (A) or a Bayesian network (B)

Results: 334 patients adult were included in the study. 89 cases were excluded for incomplete data (n=31), treatment with agents altering the renin-angiotensin system (n=32) or other secondary causes of resistant hypertension (n=26). Among the 245 case reports analyzed, 110 subjects had a biological PA and 135 subjects were considered as having an essential hypertension. Sensitivity reached (100% vs 63.3%) and specificity reached (89.6% vs 67.2%) using the Bayesian network or the logistic regression respectively. The area under the ROC curve (figure) obtained with the Bayesian network was significantly higher than the one obtained by the stepwise regression (p<0.001).

Conclusions: In hypertension centers, Bayesian network provided a satisfactory clinical prediction rule to detect patients with a PA. An external validation study is required before its use in primary clinical settings.

PP.39.24 PRIMARY HYPERPARATHYROIDISM AND CARDIOVASCULAR DISEASE. A CASE REPORT

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Objective: A 37-year-old bike-trained man with history of hypertension and kidney stones, treated with amlodipine 10 mg, was found to have echocardiographic myocardial calcifications and diastolic filling impairment. We evaluated a possible common cause among hypertension, kidney stones and myocardial calcifications.

Design and method: Secondary causes and target organ damage of hypertension were investigated by laboratory and instrumental analyses.

Results: At the admission in the outpatient clinic, BP was 180/110 mm Hg. Laboratory routine and ECG were normal, but urinary-albumin excretion was increased (77 mg/24 h). Echocardiography revealed moderate concentric left ventricular hypertrophy (LVH) [(mass/height 2.7) = 56.77 g/m2.7; relative wall thickness = 0.46], prolonged left ventricular relaxation (E/A ratio = 0.9; age and heart-rate adjusted E/A ratio= 0.6; Deceleration Time= 169 msec) and widespread dense spots, consistent with myocardial calcifications. Carotid intima-media thickness was increased. Laboratory analyses detected an altered calcium/phosphorus metabolism and a concomitant secondary hyperaldosteronism (see table).

	Patient's values	Normality range
Serum calcium (mg/dL)	12.6	8.9-10.3
Serum phosphorus (mg/dL)	2.0	3.0-4.5
Serum creatinine (mg/dL)	0.9	0.5-1.2
Parathyroid hormone (pg/mL)	96	10-75
24-hour urinary calcium (mg)	750	50-400
24-hour urinary phosphorus (mg)	820	400-1000
Plasma aldosterone (pg/mL)	211	12-125
Plasma renin (pg/mL)	60	0.9-13

Parathyroid scintigraphy showed right-inferior parathyroid adenoma. The kidney ultrasound scan revealed bilateral nephrolithiasis and nephrocalcinosis. Kidney's intraparenchymal vascularization was globally reduced by color-Doppler.

Conclusions: Symptomatic primary hyperparathyroidism, as presented by our patient, is associated with increased prevalence of hypertension, LVH independently of blood pressure, diastolic filling impairment, valvular and myocardial calcification, alterations of renin-angiotensin-aldosterone (RAA) system. These abnormalities well explain why is primary hyperparathyroidism also associated to increase cardiovascular mortality.

In the context of primary hyperparathyroidism, the increased activity of the RAA system, found in our patient, might be also correlated with the impairment of renal circulation, as suggested by the reduction of the intraparenchymal vascularization; thus it is conceivable that elevated levels of circulating parathyroid hormone may play a role in the pathogenesis of nephroangiosclerosis.

PP.39.25 DETERMINATION OF PLASMA METHOXYTYRAMINE AS A METASTATIC PHEOCHROMOCYTOMA BIOMARKER

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Objective: Determination of metanephrines (catecholamine metabolites) from blood plasma plays an important role in the diagnosis of pheochromocytoma (PHEO) and paraganglioma (PGL) – chromaffin cell tumors. We studied whether it is possible to utilize plasma 3-methoxytyramine, the O-methylated metabolite of dopamine, as a biomarker for malignant PHEO and/or PGL. In agreement with recent scientific articles, increased methoxytyramine can be used for distinguishing between patients with and without metastases.

Design and method: We tested patients with and without diagnosis of PHEO and/or PGL. The diagnosis of several selected patients was PGL of the head and neck accompanied by metastases.
All selected patients were fasting overnight and on a special diet before blood taking. Heparin was used as an anticoagulant. The blood corpuscles were separated by centrifugation. 3-methoxytyramine from plasma matrix was extracted by SPE (solid phase extraction) and subsequently determined by HPLC with electrochemical detection (HPLC–ED).

Results: In all patients with PGL of the head and neck accompanied by metastases, we found that the concentrations of plasma 3-methoxytyramine was at least ten times higher than in patients without metastases.
We observed no significant differences in methoxytyramine concentrations in patients with PHEO and/or PGL without metastases as well as in patients without tumor.

Conclusions: According to our results, plasma 3-methoxytyramine can be used successfuly as a biomarker for distinquishing between patients with metastatic malignant PGL and/or PHEO and patients with malignant PGL and/or PHEO without metastases. Furthermore, the methoxytyramine levels in patients with metastatic tumor and in patients without tumor did not distinct significantly.

PP.39.26 IMAGE TECHNIQUES IN THE DIAGNOSIS OF PRIMARY ALDOSTERONISM: WHICH IS THE OPTIMAL ONE?

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Objective: Primary aldosteronism (PA) is the most frequent endocrine cause of secondary hypertension. The classical clinical setting was hypertension accompanied by hypokaliemia and metabolic alcalosis due to an adrenal adenoma. Nowadays, different settings and morphologies are quite frequent in clinical practice.
Our aim is to study the sensibility and specificity of the image techniques (Computering tomography –CT- vs gammagraphy with i-cholesterol), for PA diagnosis.

Design and method: This is a retrospective study including 157 PA patients followed-up at the hypertension unit of the Hospital Clínico San Carlos, Madrid, Spain.

Results: 157 patients were included, 56.1% males. Mean age 56.9 (11.7) years-old. The most frequent organ damage was left ventricle hypertrophy, appearing in 69% of the cases.
CT diagnoses were: adenoma 28.3% (left 17.6%, right 10.7%), nodular bilateral hyperplasia 21.4%. Gammagraphy diagnoses: bilateral hyperplasia 51.9%, adenoma 19.5% (left 7.8%, right 11.7%). After completion of the study with adrenal vein sampling (AVS), final diagnoses were: nodular bilateral hyperplasia 34.2%, bilateral hyperplasia 31.6% and adenoma 17.4%.
We did not find concordance between techniques, with a kappa index of 0.00.
Concordance in the diagnoses of CT and AVS showed a sensibility of 91.3% and a specificity of 63.4% for adenoma diagnosis, and gammagraphy a sensibility of 91.2% for hyperplasia.

Conclusions: Bilateral disease is the most frequent diagnosis in our population, independently of what technique was used.
In patients with PA, a complete study should be performed, and AVS is mandatory before an aggressive treatment was performed, as its results might change in a relevant way the previous diagnosis. Up to 10% of adenomas suspected in CT do not have an unilateral secretion of aldosterone in AVS.
Concordance between CT and gammagraphy is very low; therefore, clinicians should keep in mind their different sensibility for every diagnosis in PA population.

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PP.40.01 THE DEPENDENCE OF BLOOD PRESSURE OF ANTHROPOMETRIC DATA OF A PERSON UNDER THE AGE FROM 16 TILL 30 YEARS

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Objective: Blood pressure is one of the important parameters of human organism, which is associated with a large number of physiological and biochemical processes that can influence on the anthropometric parameters of the organism. Some of the anthropometric characteristics of the human body can be influenced by changing lifestyle, diet etc. Therefore, it is important to know how an anthropometric parameter can affect blood pressure. Thus the main task of this research is to study the relation of blood pressure with the anthropometric parameters of human organism.

Design and method: The study involved 120 people (80 men and 40 women) aged from 16 to 40 years. Blood pressure measurement was taken within 5 minutes after sitting position. Anthropometric data included the following parameters: 1. Sex, 2. Age (full years), 3. Height (cm). 4. Weight (kg). 5. Hip size and waist (cm). 6. Body composition was checked by bioimpedansmetr analyzer from company «Medass».

Results: The correlation between the measured and calculated systolic blood pressure in men. R=96% p<0.0001).
A multiple regression equation in this case is presented below:
AD Syst. = 98.0 - the 76,429*Inside fluid - 1,53048*Main fluid exchange - 13,0219*body mass Index + 69,4529*Skinny weight + 29,9356*Active cell mass + 5,42969*the Share of the active cell mass - 12,0383*Skeletal muscle mass + 0,792946*the main fluid exchange - 55,0804*Extracellular Fluid + 5,79741*%fat mass.
The correlation between the measured and calculated systolic blood pressure in women. R=99% p<0.0001). A multiple regression equation looks like this:
ADsis. = 98.0-the 2,0545*age - 7,47313*weight + 1,73552*waist size -95,4431*Phase angle + 125,776*Inside fluid + 11,0272*body mass Index 141,321*Skinny weight + 24,7281*the Share of the active cell mass + 20,6819*Skeletal muscle mass - 8,02601*Share of skeletal muscle - 0,638736*specific BX + 76,1769*total liquid + 96,296*Extracellular fluid.

Conclusions: This study showed that the blood pressure in young men and women can be predicted by anthropometric data. It can be used to assess the effectiveness of the treatment of hypertension by different groups of drugs in clinical trials.

PP.40.02 FACTORS, ASSOCIATED WITH LONG-TERM ADHERENCE TO ANTIHYPERTENSIVE MEDICATIONS IN PATIENTS OF CARDIOLOGY CLINIC IN RUSSIA

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Objective: To analyze the factors associated with adherence to antihypertensive therapy (AHT), prescribed to the patients with hypertension (AH) in the specialized outpatient cardiology clinic.

Design and method: A Study includes two stages. On the the first stage we analyzed medical records of all patients with AH (1766 persons), first applied to specialized cardiac clinic in Moscow to the clinic in 2010 year. The second stage included telephone survey of 1419 patients which we were able to reach at 6 months after the first visit to the clinic (response rate 80.4%). The special questionnaires were developed to evaluate patients adherence and factors, associated with it.

Results: During the telephone survey 74.9% of patients reported every day taking the prescribed medications, 8.9% did not take the medications at all, and 16.2% of respondents take AHT periodically. At the same time, 74.9% of respondents changed the recommended scheme of treatment.
Factors associated with the refuse of treatment included male gender (10.1% vs women 5.8%, p=0.001), younger age (aged 30-50 years 13.5% vs older 60 years 5.3%, p<0.05), absence of comorbidity (absence of CHD 10.6% vs CHD comorbidity 4.1%, p<0.0002), AH diagnosis less than 5 years (11.8% vs more than 5 years 4.1%, p<0.0002).
Factors associated with a AHT schema change included: CHD comorbidity (64.3% vs 55.8% absence of comorbidity, p=0.0003), AH diagnosis more than 5 years (69.5% vs less than 5 years 60.4%, p=0.0003), absence of calcium channel blockers (74.4% vs 68.5%, p=0.03), and fixed combinations (76.1% vs 60.3%, p<0.0002), but the use of beta-blockers (74.8% vs 69.2%, p=0.03) in the treatment.
Causes of treatment regimen changing included: absence of medication's reimbursement (23.4%), the recommendation of another physician (21.9%), poor tolerance of therapy (19.9%), return to previous therapy (19.3%), the high costs of treatment (18.4%).

Conclusions: Results of the study revealed a category of patients who need special attention due to the risk of failure of AHT or change the recommended treatment regimens.

PP.40.03 COMPLIANCE OF ANTIHYPERTENSIVE TREATMENT IN LVIV CLINICAL HOSPITAL N4 IN UKRAINE ACCORDING TO GUIDELINES OF EUROPEAN SOCIETY OF HYPERTENSION

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Objective: Hypertension is the most important modifiable risk factor for coronary heart disease, stroke, congestive heart failure, end-stage renal disease, and peripheral vascular disease, but the irrational choice of antihypertensive therapy and polypharmacy may lead to undesirable consequences.

Design and method: The study included 50 patients of both sex (25 male and 25 female) aged 40-60 years with hypertension II stage without other cardiovascular or systemic diseases. We used retrospective analisis of medical histories of patients, who were treated during 2010-2011 in Lviv Clinical Hospital N4, in Ukraine.

Results: In the course of analysis of prescribed therapy in Lviv Clinical Hospital N4 following results were obtained: 22% of patients with hypertension the 2nd stage received monotherapy, 76% of patients received combination of 2-3 first-line antihypertensive drugs, 1 patient (2%) did not receive any antihypertensive drug. Aspirin was prescribed to 52% of patients, statins were prescribed to 82% of patients. All 50 patients (100%) received «metabolic therapy», which doesn't have proven effectiveness and is not recommended by guidelines of European Society of Hypertension.

Conclusions: Retrospective analysis of medical histories of patients with hypertension the 2nd stage in Lviv Clinical Hospital N4 demonstrated satisfactory compliance to guidelines of European Society of Hypertension, although subscription of metabolic therapy for patients with hypertension is too high, despite the lack of evidence based recommendations.

PP.40.04 COMPARING BLOOD PRESSURE CONTROL IN HYPERTENSIVE PATIENTS WITH DIFFERENT FOLLOW-UP VISIT RATE. A RETROSPECTIVE STUDY

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Objective: The aim of the present study was to compare blood pressure control in hypertensive patients that had follow-up visit intervals either less than a year or between one to three years.

Design and method: This retrospective population study consisted of 718 hypertensive non-diabetic adult patients (218 males) aged 26-80 years old (mean 57.7±9.8 years) of an outpatient hypertension clinic of a tertiary hospital that were followed up for three to twenty years (mean 7.8±4.1 years). A descriptive analysis was performed to assess the population systolic, diastolic and mean arterial blood pressure (SBP, DBP and MAP) at baseline and last visit. Patients were grouped in two groups according to the mean interval between their visits. The means of these groups were compared using an independent samples t-test.

Results: The mean SBP, DBP and MAP at baseline were 149.7±14.8, 90.2±8.7 and 110±8.7mmHg respectively and were similar in the two groups. The mean SBP, DBP and MAP at last visit were 143.8±15, 84.6±7.3 and 104.3±8.4mmHg respectively. Independent samples t-test revealed a significant mean MAP difference (-2.55±0.23mmHg, $p<0.001$) between patients who had mean visit intervals less than a year (mean MAP=104.6±8.9mmHg) and patients with mean visit intervals between one to three years (mean MAP=107.2±8.9mmHg).

Conclusions: Patients with closer follow-up appeared to have a better blood pressure control. This could be the result of both better compliance and early intervention.

PP.40.05 DURATION OF FOLLOW-UP AND CONTROL OF CARDIOVASCULAR RISK FACTORS IN ELDERLY OUTPATIENTS

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Objective: Weakening of compliance is one of the main reasons of failure in the treatment of cardiovascular risk factors (CVRFs) and often leads to weight gain in obese patients after the first months of diet. Compliance can be improved by enhancing patient's motivation through an empathetic reinforcement. This longitudinal intervention study aimed at assessing the impact of empathetic reinforcement on the treatment of CVRFs in an elderly outpatient population. We hypothesized that in well-motivated patients the effects of treatment on CVRFs should not fade during the follow-up.

Design and method: 406 patients (306 F) over 60 years of age, referred to 2 public Outpatient Clinics for CVRFs control, were visited by the same physician for a period up to 183 months (M±SD =23±35, median =6.1). The recommendations of US guidelines on hypertension treatment about empathetic reinforcement were applied. Lifestyle was assessed by a structured questionnaire. Decimal logarithm of follow-up duration and of number of visits were used, in order to normalize their distribution.

Results: Body mass index (BMI) (33.7±6.4 to 32.6±6.1 kg/m², $p<0.001$), blood pressure (BP) (154/86±25/12 to 142/79±23/11 mmHg, $p<0.001$), waist circumference (WC), cholesterol, and triglyceride levels were significantly reduced during the follow-up. Smoking habit (SH) was also reduced (sign test significance =0.005).
Change in BW and in diastolic BP were significantly correlated with follow-up duration ($r= -0.186$, $p<0.001$ and $r= -0.137$, $p<0.01$ respectively). Number of visits was correlated with changes of the following variables: BW ($r= 0.252$, $p<0.001$); diastolic BP ($r= -0.119$, $p<0.02$); cholesterol ($r= -0.133$, $p<0.05$); triglyceride ($r= -0.202$, $p<0.005$).
Stepwise multiple regression analysis showed that percent BW change was independently associated with baseline BW and with follow-up duration ($R^2=0.094$; significance <0.001), but not with age, gender, education level, physical activity and SH. Percent diastolic BP change was independently associated with baseline BP, follow-up duration and either physical activity ($R^2=0.242$) or SH ($R^2=0.243$; significance <0.001 for both analyses).

Conclusions: These data suggest that empathetic reinforcement is useful in the treatment of CVRFs in elderly outpatients. In particular, BW gain, which usually follows the initial effect of hypocaloric diet in obese patients, is avoided.

PP.40.06 PREVALENCE OF CONTROLLED HYPERTENSION AT THE 'UNIDAD DE HIPERTENSION ARTERIAL HOSPITAL JOSE MA VARGAS TACHIRA' DURING 2009-2013

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Objective: Hypertension is a major risk factor for heart disease and stroke. And is the first atributable cardiovascular risk of mortality around the world Hypertension treatment reduce cardiovascular mortality and morbility,but instead of this, the grade of controlled hypertension at tragets values are so poor. it is around 20% like the Carmela study,a seven latin american countries. The objetive is evaluated the prevalence of controlled hypertension at our unit.

Design and method: An observational,crossectional study, a 2850 patients atended during 2009 to 2013 period, 734 medical records were evaluated, blood pressure was taken by Oscilometric thecnic, using OMRON 907 device, peronal,family hystory were taken,anthropometric data was registred, therapeutic aproach was doing using the binding titration in two steps,the low risk patients satrted with one drug,high and very high risk patients started with combination, uptitration was doing to forced BP control, and up to doble doses each month.laboratory test were performed, ECG, and ABPM

Results: of 2850 records only 734 meet the inclusión and exclusión criteria,439 (59,81%) patients were controlled reach BP below 140/90 , 295 (40,19%) were uncontrolled,69.37% were women, 17% of controlled hypertension were under monotherapy 83% were on combination therapy, patients uncontrolled are in a high and very high cardiovascular risk, had insulin resistence HOMA ir Averega in 3.4, and had a non dipping pattern.

Anthropometric data, baseline and last blood pressure

	First visit		Second visit		Third visit		Uncontrolled hypertension	
	Media	Standar Desviation	Media	Standar Desviation	Media	Standar desviation	Media	Standar Desviation
Age	52,85	11,67	53,71	9,67	61,75	9,95	56,05	13,48
Weight	73,18	15,29	69,52	15,66	71,84	18,22	76,95	17,43
Height	1,59	0,08	1,65	0,11	1,57	0,11	1,60	0,09
Waist Circunference	96,22	14,82	94,33	6,58	94,21	11,43	100,17	12,30
Body mass Index	28,52	5,16	25,78	3,29	29,10	7,45	29,82	5,41
Heart reat	71,14	13,06	75,57	8,46	70,00	14,09	72,31	12,24

Conclusions: the prevalence of controled hypertension were 59,81, patients individualitation were the best strategy to aproach hypertension in a mono or combination therapy, and to chose the better class of drug.

PP.40.07 ADHERENCE FOR THE CHRONIC MEDICATION THERAPY

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Objective: Adherence is a complex behavioral process strongly influenced by the environments in which people live, health care provider practice, and health care systems deliver care. Medication adherence usually refers to whether patients take their medications as prescribed and whether they continue to take a prescribed medication. The impact of poor adherence grows as the burden of chronic disease grows worldwide.
Adherence to long-term therapy for chronic illnesses in developed countries averages 50%.

Design and method: The cross-sectional survey was conducted at 106 Zagreb, Croatia pharmacies and the questionnaire was filled out by the study subjects. We used a 33-item self-administered questionnaire that included a convenience sample of 635 individuals who were buying drugs for the treatment of chronic diseases. Study subjects were divided into two groups, with adherent defined as a "yes" response to the statement that they "never fail to take their medication on time".

Results: In our study population (n=635), non-adherent subjects prevailed over adherent subjects (n=370; 58.3% vs. n=265; 41.7%). The most common diagnoses were diseases of the circulatory system (n=500; 36.8%) and endocrine, nutritional and metabolic diseases (n=285; 21.0%). The great majority of study subjects reported forgetfulness ("I just forgot") as the main reason for skipping drug doses, followed by being away from home and shortage of the drug (having consumed it all). Comparison of reasons for medication noncompliance in total study population versus subjects on antihypertensive therapy showed no statistically significant difference in any of the reasons (P=0.895).

Conclusions: Nonadherence to medication is a growing concern to patients, physicians, healthcare systems, and other stakeholders because that it is prevalent and associated with adverse outcomes and higher costs of care. There is usually no single reason for medication nonadherence, and therefore must be a comprehensive approach to improve adherence. Research on adherence has typically focused on the barriers patients face in taking their medications. Common barriers to adherence are under the patient's control, so that attention to them is a necessary and important step in improving adherence.

PP.40.08 INFLUENCE OF PATIENT WAYS OF COPING WITH HYPERTENSION ON THE COMPLIANCE OF THE ANTIHYPERTENSIVE THERAPY WITH A FIXED DOSE COMBINATION THERAPY: BETWEEN REASON AND EMOTION

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Objective: To analyze the ways of coping of hypertensive patients and its influence on the antihypertensive therapy

Design and method: French National Observational cross-sectional study conducted by 600 general practitioners who included 1976 patients aged 61,8±10.3 years (61% males), treated from at least 3 months by a fixed antihypertensive association (ACE inhibitors+CCB). Coping was evaluated using the Ways of Coping Checklist (WCC), a psychometric scale assessing the problem focusing coping (PFC: ability to deal with the disease), the emotion focusing coping (EFC: tactics developed by the patient to regulate the emotional impact of the disease) and the seeking for social support (SSS) through a self questionnaire. Compliance was evaluated using the Morisky score.

Results: According to the WCC, the PFC score was low (<36) in 83.1% of the patients whereas 73.5% of them showed an elevated EFC (>=26). Elevated SSS (>=21) was reported in 64.1% of the patients. Compliance was decreased in patients showing a low PFC in comparison to those with an elevated one, with a poor compliance (<6) in 57.3% vs. 43.6% of the patient respectively ($p<0.0001$). In contrast, an inverse relationship was shown with respect to EFC with a poor compliance reported in 57% of the patients displaying a high EFC vs. 49.2% of the patients with a low EFC ($p<0.01$). SSS does not appear to influence compliance with a low compliance reported in 53.8% of the patients with elevated SSS vs. 56.9% of those with low SSS (p=NS).

Conclusions: The ability to cope with hypertension appears quite weak in hypertensive patients whereas they demonstrate an elevated emotional coping. However, our results demonstrate that intense emotional coping and poorly developed strategies to cope with the disease both negatively influence the patient's compliance. Even though the majority of the patients are seeking actively for social supports, it does not play any role in the level of compliance. Taken together our data suggest that helping the patients to cope with hypertension and decreasing the emotional impact of its complications through the medical communication might have a positive impact on the patient's compliance of antihypertensive therapy.

PP.40.09 THE IMPACT OF HYPERTENSION COMPLICATIONS KNOWLEDGE ON ANTIHYPERTENSIVE ADHERENCE REGIMEN

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Objective: Non-adherence is thought to be one of the major common causes of uncontrolled hypertension over the world leading to useless drug dose or class changes which may lead to increased adverse effects and medical costs.
The aim of the current survey was to investigate whether hypertension complications knowledge improve antihypertensive treatment adherence.

Design and method: A cross-sectional study was carried out between May and November 2013 on a representative sample of 453 hypertensive patients at public primary care outpatients in the department of Tlemcen in Algeria. Patients with cardiovascular complications history were excluded.The adherence was assessed with the adherence evaluation scale of Girerd using a self-reporting questionnaire wich contains six items with closed dichotomous responses (yes/no), the degree of adherence was calculated according to the score resulting from the sum of all (yes) answers.A cut-off value of 80% was used to categorize patients as adherent or non-adherent. A structured questionnaire has been performed including patients knowledge about hypertension complications and the others factors which may affect adherence therapy. Statistical analyses was performed using SPSS 17.0

Results: Among the 453 patients included in the study, only 35,32% were adherents. In univariate analysis,knowledge about hypertension complications improved adherence. However, comorbidities, and number of antihypertensive drugs prescribed, was associated with poor adherence. In multivariate logistic regression, a significant difference was shown between adherents and non-adherents according the factors mentioned above and the insurance statute (table).

Independent variable	*univariate analysis*		*Multivariate analysis*	
	OR	P value	OR ajusted	P value
Complications knowledge	0,493(0,307-0,791)	0,003	0,462(0,283-0,755)	0,002
Comorbidity	1,79(1,186-2,702)	0,006	2,123(1,356-3,323)	0,001
Antihypertensive drugs number	1,392(1,075-1,803)	0,012	1,362(1,045-1,777)	0,023
Insurance statue	0,587(0,303-1,138)	0,111	0,447(0,222-0,906)	0,026

Conclusions: This study emphasize the beneficial impact of the hypertensive complications knowledge on adherence. Moreover, using fixed-dose combinations and once-daily therapy may improve effectively adherence to antihypertensive therapy.

PP.40.10 PREVALENCE OF TYPE OF NON-COMPLIANCE IN PATIENTS WITH HYPERTENSION

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Objective: To reveal a prevalence of non-compliance among patients with hypertension represented pedagogical staff of the Azerbaijan Pedagogical University.

Design and method: 115 patients (79 female,36 male; age 35 - 70) with hypertension (stage 1-3) were interviewed to reveal prevalence of non-compliance type.
Receiving a prescription but not filling it - 3 pts(3 male)
Taking an incorrect dose 43pts(29 male, 14 female)
Increasing or decreasing the frequency of doses- 9 (8 male,1female)
Stopping the treatment too soon - 68 (59male, 9 female)
Delaying in seeking health care - 23 (20male, 3 female)
Non-participation in clinic visits - 56 (47male, 9 female)
Failure to follow doctor's instructions - 12 (all male)
Patients stop the therapy for a while and then restarts the therapy - 96 (81male,15 female).
Patients are compliant to the medication regimen around the time of clinic appointments - 64 (47 male,17 female).

Results: Stopping the therapy for a while and then restart the treatment,stopping the treatment soon, patients are compliant to the medication regimen around the time of clinic appointments,non-participation in clinic visits - the major type of non-compliance in cohort of patients with hypertension.

Conclusions: Non-compliance to medications in patients with hypertension remains problem and this problem has to be resolve.

PP.40.11 PRICE OF THE DRUG AS A BARRIER TO EFFECTIVE TREATMENT OF ARTERIAL HYPERTENSION IN THE PERCEPTION OF PHYSICIANS AND PATIENTS

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Objective: Identify feelings for antihypertensive drugs costs of doctors and patients in Russia.

Design and method: The study involved 485 healthy respondents and 420 patients with arterial hypertension (AH) aged 25 to 85 years. Compared groups did not differ in age and sex. Parallel investigated 540 therapists and cardiologists outpatient practice. The study was conducted in Nizhny Novgorod, Perm, Cheboksary, Stavropol, Kazan, Kirov, Ryazan, Yekaterinburg and Vladivostok. Survey research methods were using the technique 'Incomplete proposals' (variant of a Sachs-Sydney) and profile in the form of an extended interview (multiple choice answers from questions).

Results: Difficulties for the physician in the treatment of hypertensive patients is 'the unwillingness of the patient to be treated' (65.3%) and 'high price of the drug' (64.7%). Doctors prescribe original and modern drugs, first consult with the patient and find out whether this treatment is inexpensive cost (79.6%). 25.7% of doctors are experiencing inner feelings in this case. Doctors characterize modern antihypertensive drugs as 'effective' (61%), 'not effective, poor' (17.9%), 'above all, expensive' (21.1%). Patient is ready to take any medicine if the doctor will explain what the medication (45% of patients with hypertension and 42% of respondents). 30% of patients don't fulfill the doctor's recommendation, as it does not believe the doctor. 38% of patients are afraid of side effects, and 21% did not understand the explanation physician. Only 28% of women and 19% of men with AH called modern drugs expensive and cannot accept them. 50% of men and 43% of women with hypertension noted that price is important, but if the doctor will explain what they are willing to buy an expensive and effective drug. 43% of women and 29% of men with hypertension responded that more important for them to be treated effectively.

Conclusions: For a doctor in Russia, the price of the drug is a powerful barrier in the treatment of hypertensive patients. He believes that modern antihypertensive drugs are expensive and inaccessible to the public. Treatment is the main for the patient, so the price of the drug is not a barrier.

PP.40.12 FACTORS ASSOCIATED WITH 2-YEAR PERSISTENCE IN FULLY NON REIMBURSED LIPID-LOWERING TREATMENTS (STATINS AND NUTRACEUTICALS)

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Objective: Long-term persistence on lipid-lowering treatment is usually low in clinical practice. The lack of treatment reimbursement is one of the main predictors of non-persistence in therapy. Our aim was to evaluate the main factors associated with long-term persistence in lipid-lowering treatment among patients without right to drug reimbursement.

Design and method: We retrospectively evaluated the clinical charts of moderately hypercholesterolemic subjects visited each 6 months over at least 2 years during a 6-year period in the outpatient lipid clinics of the University of Bologna, in primary prevention for cardiovascular disease, without right to reimbursement of lipid-lowering treatments based on the Italian regulation. We selected 628 subjects (M: 307; F: 311, mean age 59±9 years old), to whom we firstly prescribed a statin (N. 397) or different kind of lipid-lowering nutraceuticals (N. 231), mainly containing red yeast rice more or less associated to other active components. Then, depending of their will, patients took brand statin (N. 194) or generic statins (N. 203), without significant differences among genders.

Results: In our cohort of patients, the main determinants of long-term persistence in therapy are female sex, family history of early cardiovascular disease, baseline LDL-C and treatment with nutraceuticals versus statins. Persistence appears not to be influenced by patient age, smoking habit, adverse events during treatment, and estimated cardiovascular risk. The target LDL-C<115 mg/dL was reached by the 76% of patients on statins (without significant differences between generic and brand statins) and by the 67% of those on nutraceuticals ($p<0.05$).

Conclusions: On the basis of our data, it seems that the use of lipid-lowering nutraceuticals is associated to a higher long-term persistence in therapy than full paid statins, while the use of brand statins a higher persistence in therapy than generic drugs, independently from the cost of the treatment.

PP.40.13 THE DEVELOPMENT AND VALIDATION OF A SCALE ASSESSING FACTORS INHIBITING THE LEVEL OF ADHERENCE AMONG PATIENTS WITH HIGH BLOOD PRESSURE

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Objective: The purpose of the present study was to develop and validate a scale in order to examine the contribution of five significant factors in level of adherence among hypertensives.

Design and method: From a pool of questions derived from a review of relevant literature, 24 items were initially selected for the first draft of the scale. A panel of seven experts who specialized in blood pressure clinical research and practice assessed the content validity of the initial scale. Participants indicate their degree of agreement with each statement on a five-point Likert scale (where 0 = strongly disagree, 1 = disagree, 2 =uncertain, 3 = strongly agree and 4 =strongly agree).This study used a case-report survey design. Data collection for this research occurred between February 7, 2013 and March 10, 2013. The sample consisted of 68 participants both hypertensives and non-hypertensives and were standardized regarding to sex, age, marital status and educational status.

Results: The Cronbach' alpha factor for total scale among hypertensives and non-clinical sample was 0.853 and 0.781, for economic factors was 0.782 and 0.764, for patient-family relationship was 0.827 and 0.807, for level of accessibility was 0.722 and 0.697 and for patients' life style was 0.691 and 0.591, respectively, whereas for patient-physician relationship was 0.699 in both samples. The regression analysis proved that patient-physician relationship, level of accessibility and economic factors were strongly associated with persons' keeping appointment in both samples; however the greatest contribution had the relationship with physicians ($p<0.01$). On the contrary, poor medication adherence was associated with economic factors, however, the greatest contribution had patients' life style (beta=0.769 and 0.782, respectively, $p<0.01$). Finally, adherence in life style recommendations was influenced only by the patient-physician relationship in both samples (beta=0.998; $p<0.01$).

Conclusions: The tool is appropriate to assess factors affecting adherence in self-behaviours both in hypertensives and non-clinical samples. It is essential that economic factors influence more patients' adherence in appointment keeping than in medication adherence. In addition, the patient-physician relationship underlies the main factor for patients to follow a healthy life style and to enhance their self-behaviours.

PP.40.14 INTERRUPTION OF TREATMENT AND BLOOD PRESSURE CONTROL: CHALLENGES AND PROSPECTS MULTIDISCIPLINARY TEAM

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Objective: To evaluate compliance to treatment of hypertensive patients with uncontrolled pressure in specialized service, knowing the dropout rate to the service and blood pressure control.

Design and method: This is case-control study with hypertensive patients in specialized treatment. We identified all those who were there more than a year without attending to any query and these were considered in situations of abandonment of service. It was also calculated the rate of blood pressure control. The outcome variable was the uncontrolled BP and predictor variables were: sociodemographic variables, number of antihypertensive use, lifestyle, risk factors for cardiovascular disease, body mass index, time since diagnosis, treatment time and treatment time in the specialized service and adherence to pharmacological treatment. To assess compliance, we applied the Morisky-Green test both among those identified as hypertensive uncontrolled blood pressure (case group) and among those with controlled pressure (control group).

Results: In 2011, the dropout rate in service was 6.4%, and in 2012 this rate was 11.0%. The rate of blood pressure control in 2011 was 73.9% and in 2012 was 61.7%. Those who had uncontrolled pressure had more patients in situations of low adherence (64.5%) than the group of controlled hypertensive (43.3%).

Table 01 – Distribution of the number and percentage of patients according to the evaluation of adherence by Morisky-Green test of each group. Goiania, Goias, 2013 (n=140).

	Case Group (n=110)		Control Group (n=30)		p
	n	%	n	%	
High Adherence	39	35,5	17	56,7	**0,04**
Low Adherence	71	64,5	13	43,3	
• Non-intentional Low Adherence	51	46,4	11	36,7	0,34
• Intentional Low Adherence	-	-	2	6,7	**0,01**
• Low Adherence both behaviors	20	18,2	-	-	**0,01**

Conclusions: We found a low dropout service compared to other centers. This is reflected in the rate of BP control. Non-adherence to treatment may explain the lack of BP control.

PP.40.15 THE NURSING INTERVENTION AND ITS REFLEXES ON THE PERCEPTION OF THE ILLNESS AND THE ADHERENCE TO THE TREATMENT BY HYPERTENSIVE PATIENTS: A RANDOMIZED CLINICAL TRIAL

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Objective: To evaluate the nursing intervention reflexes on the compliance to the treatment by hypertensive patients with uncontrolled blood pressure.

Design and method: The study group (SG) received interventions through weekly phone calls and nursing consultations after the medical consultation. The control group (CG) remained in their routine treatment. In the first and in the last approach, tests were administered in order to evaluate the adherence to the pharmacological treatment, perception and patient´s beliefs. It is a randomized controlled trial.

Results: The reduction of the average systolic blood pressure on the SG (28.4 mmHg) was higher than on the CG (20.7 mmHg) (p<0.05). In the end, there were no alcoholic patients on the SG. The difference in the reduction of the adherence rates was of 46.6% on the SG, and 27.6% on the CG (p<0.05). Those who had a better perception of the personal control over the illness had higher adherence to the pharmacological treatment.

Conclusions: The intervention done by the nursing altered both treatment adherence and blood pressure control rates. The group that participated of the intervention showed better understanding over the chronicity and consequences of the illness.

PP.40.16 EVALUATION OF GUIDELINES ADHERENCE FOR ASPIRIN DOSING IN PATIENTS WITH CORONARY HEART DISEASE

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Objective: To study the prescribing patterns and evaluate guidelines adherence for aspirin dosing in patients with coronary heart disease (CHD).

Design and method: In this descriptive cross-sectional study, 66 CHD patients admitted to McCormick hospital between January 2008 and May 2012 were enrolled by simple random sampling. The guidelines adherence for aspirin dosing was assessed by using the medical assessment tool developed from ACC/AHA guidelines. Data were analyzed by descriptive statistics.

Results: Most of patients were female (54.5%) and mean age was 63.8±13.8 years. Hypertension, diabetes mellitus, and dyslipidemia accounted for 51.5%, 30.3%, and 22.7 of patients, respectively. Overall, the average of guidelines adherence score for aspirin dosing was 20.3% and was better for patients with unstable angina (44.4%) than patients with NSTEMI (27.3%), patients who were not classified type of CHD (9.5%) and patients with STEMI (0.0%). Totally, the majority of patients (75.7%) had guidelines adherence score less than 20.0%, but only few patients (4.5%) got 80.0% or more.

Conclusions: This study has demonstrated that guidelines adherence for aspirin dosing in patients with CHD was extremely sub-optimal, especially in NSTEMI and STEMI. There is still much room for improving aspirin dosing in clinical practice for these patients.

PP.40.17 EVALUATION OF GUIDELINES ADHERENCE FOR ANTIHYPERTENSIVE DRUGS PRESCRIBING IN HYPERTENSIVE PATIENTS WITH CHRONIC KIDNEY DISEASE

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Objective: To study the prescribing patterns and evaluate guidelines adherence for antihypertensive drugs, and to quantify the achievement of target blood pressure control in hypertensive patients with chronic kidney disease.

Design and method: In this cross-sectional descriptive study, 99 patients with hypertension and chronic kidney disease who received medical treatment from outpatient department of McCormick hospital between December 2010 and August 2013 were enrolled by simple random sampling. Patients who were provided health services or antihypertensive medications from any other health care facility were excluded. The guidelines adherence for antihypertensive drugs prescribing was assessed by using the medical assessment tool developed from JNC 7 and NKF-K/DOQI guidelines. Data were analyzed by descriptive statistics.

Results: The mean age of patients was 57.0±13.8 years and most of them (61.6%) were male. Diabetes mellitus, dyslipidemia, and gout accounted for 54.4%, 25.6%, and 25.6% of patients, respectively. The average number of antihypertensive drugs prescribed was 2.0 ± 1.2. The most frequently prescribed antihypertensive drug was CCBs (71.1%), but only 31.3% for ACEIs/ARBs. Overall, the average of guidelines adherence score was 67.1% and was better for treatment criteria domain (89.1%) than antihypertensive drugs use domain (72.3%) and treatment follow-up domain (55.5%). Blood pressure control was the worst domain because only 29.3% of patients had achieved the target blood pressure goal. Totally, almost half of patients (46.4%) had guide adherence score between 60.0%-79.9% but only one-fifth of patients (23.2%) got 80.0% or more.

Conclusions: The present study has demonstrated that antihypertensive drugs was quite optimally prescribed follow the standard treatment guidelines in hypertensive patients with chronic kidney disease, but there is still much room for improving clinical practice for these patients especially achievement of blood pressure control. This information will be useful for guiding and raising the awareness of physicians in practice for the prescribing of antihypertensive drugs in chronic kidney disease patients and also leading to achievement of blood pressure control, decrease complications and death of patients.

PP.40.18 CORRELATION OF SEX, ANTHROPOMETRIC MEASUREMENTS AND COMPLIANCE TO ANTIHYPERTENSIVE TREATMENT WITH BP CONTROL IN HYPERTENSIVE PATIENTS

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Objective: The effect of sex, body mass index (BMI) and monotherapy or fixed combination on the effective treatment of hypertension has been the subject of research. The object of this study was to investigate the correlation between BMI and antihypertensive therapy with blood pressure (BP) control in two sexes.

Design and method: Retrospective study of 540 hypertensive patients (229 men and 311 women, mean age 73 +2, 50 to 85 years old) from the Outpatient Hypertension Clinic of a tertiary University Hospital (2011-2012). Their weight, height, antihypertensive medication and compliance as well as measurements of BP were recorded.
The data were analyzed using the SPSS version 15.0 for Windows. For the comparison of categorical variables, chi-square test was used. The level of statistical significance was defined as P value <0.05

Results: 207 patients (38,2%, 14.04% men and 24.26 % women, p<0.05) have well controlled (WC) BP. A comparison of anthropometric parameters between men and women with well controlled BP, showed that BMI was an independent factor for the control of BP (p<0.05).

	Monotherapy (M)	Fixed Combination of two medications (FC)	Women	Men	BMI
Well controlled (WC) (n=207)	68.12%	31.88%	63.28% (40.58% M 22.7% FC)	36.72% (27.54%M 9.18%FC)	27.4 (Men:26 Women: 28)
Not controlled (NC) (n=333)	65.77%	34.23%	54.05% (36.03%M 18.02%FC)	45.95% (29.73% M 16.22%FC)	29 (Men:27.4 Women: 30.4)

Table 1 shows the percentages of the patients -according to sex- receiving monotherapy or fixed combination in the study population

From table 1, it can be deduced that most of the patients were receiving monotherapy and even when receiving combination of antihypertensive medications, they were receiving only two. In the group of WC patients, there were more women WC than men (p<0.05). More women WC were receiving >1 medication in FC compared to men (p<0.05).

Conclusions: BMI is confirmed as an important parameter for the BP control. Women are a majority in the WC group and despite the fact that they have higher BMI, 2/3 of them receive monotherapy and furthermore there is a statistically significant difference in FC treatment compared to men. The better control of BP in women can be explained by the greater proportion of combination therapy and so the better compliance to treatment.

PP.40.19 ANTIHYPERTENSIVE MEDICATIONS ADHERENCE AND ITS DETERMINANTS IN NIGERIAN HYPERTENSIVE SUBJECTS

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Objective: Achieving good blood pressure control in hypertensive subjects is key to reducing the risk of cardiovascular events and mortality. Poor adherence to medications has been linked with increased cardiovascular risk and mortality in many populations. Africans have been shown to have a worse prognosis from hypertension and kidney diseases when compared to Caucasians.
Objectives: To describe the frequency of adherence to antihypertensive medications, relationship to blood pressure control and its determinants among hypertensive subjects attending LAUTECH Teaching Hospital, Ogbomoso, Nigeria.

Design and method: An analytical cross sectional study. The 8 parameter Morisky scale was used to assess for adherence to antihypertensive medications. Clinical and demographic data were taken. Statistical analysis was done using SPSS 17.0. $P<0.05$ was taken as statistically significant.

Results: One hundred and fourteen hypertensive subjects were recruited for this study. They consisted of 60 males (52.6%) and 54 females (47.4%). The mean age was 63.63±14.10 years. High adherence, low adherence and medium adherence as defined by Morisky scale was found in 42(36.8%), 27(23.9%) and 45(39.5%) respectively. High adherence seems to be associated with fewer medications but not with the duration of hypertension. Those with good adherence were likely to be older, had a higher level of education, higher average monthly income and a better quality of life than those with poor adherence.

Conclusions: Poor adherence to medications is very common in the hypertensive Nigerians. Effective health education and regular screening for compliance and adherence is a potential way to reduce cardiovascular risk associated with uncontrolled hypertension.

PP.40.20 RENAL DAMAGE AND VASCULAR CALCIFICATIONS IN HYPERTENSIVE PATIENTS

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Objective: Uric acid, creatinine and glomerular filtration rate (GFR) values are useful parameters of renal dysfunction in hypertension. The study aimed to estimate the arterial calcification by correlating serum levels of osteoprotegerin (OPG) and nuclear factor kappa B ligand (RANKL) with renal indicators in hypertensive patients with or without coronary artery disease (CAD).

Design and method: The present study was conducted on 223 hypertensive patients divided in two groups: with or without CAD, based on angiographically evidence. The groups were compared to a CONTROL group of 74 healthy subjects. Serum uric acid, creatinine and glomerular filtration rate (GFR) were evaluated in all groups. Serum levels of OPG and RANKL were determinated by ELISA. Chronic Kidney Disease Epidemiology Collaboration formula was used to estimate GFR.

Results: The values of uric acid were significantly higher in hypertensive patients with CAD than in hypertensive patients without CAD and in the CONTROL group (6.3±1.85 vs 5.8±1.78 vs 4.7±1.19 mg/dl, all $p<0.001$). A significantly positive correlation between serum uric acid values and OPG ($r=0.637$, $p<0.001$) and a negative correlation with RANKL ($r=-0.287$, $p<0.001$) was observed. The correlation between OPG/RANKL ratio and uric acid levels was significantly positive ($r=0.312$, $p<0.001$). Serum creatinine was significantly positive correlated to OPG ($r=0.210$, $p<0.001$) and negatively correlated to RANKL ($r=-0.285$, $p<0.001$). A significantly negative correlation between GFR and OPG ($r=-0.596$, $p<0.001$) and a positively one between GFR and RANKL ($r= 0.301$, $p<0.001$) was obtained.

Conclusions: The renal damage evaluated by serum uric acid, creatinine and GFR values is significantly associated with the progression of vascular calcification in hypertensive patients.

PP.40.21 INCREASE IN SERUM URIC ACID CONCENTRATION AFTER ADMINISTRATION OF LOW-DOSE THIAZIDE DIURETICS WAS ASSOCIATED WITH DECLINE IN RENAL FUNCTION

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Objective: Most of the evidences demonstrated that low-dose thiazide diuretics reduce mortality and morbidity in hypertensive patients. However, low-dose thiazide diuretics failed to reduce coronary events in patients whose serum uric acid (SUA) increased more than 0.06 mmol/l after initiation of the diuretic therapy in the Systolic Hypertension in the Elderly Program (SHEP). The purpose of this study is to elucidate the factors that are associated with increase in SUA in hypertensive outpatients who were newly prescribed low-dose thiazide diuretics.

Design and method: Study subjects were hypertensive patients who were administered low-dose thiazide diuretics (less than or equal to 25 mg of hydrochlorothiazide) in outpatient clinic of the Hospital of Hyogo College of Medicine. We retrospectively investigated systolic blood pressure (SBP), SUA, and estimated glomerular filtration rate (eGFR: determined by modified Modification of Diet in Renal Disease (MDRD) Study equation for Japan) before (pre-SBP, pre-SUA, and pre-eGFR) and after initiation of thiazide diuretics. We analyzed the relationship between the change in SUA (ΔSUA) and pre-SBP, pre-SUA, pre-eGFR, the change in eGFR (ΔeGFR), and the change in SBP (ΔSBP).

Results: Fifty-nine hypertensive patients (25 females) were included in this study. Patient characteristics were as follows: age 66±11 years, pre-SBP 152±26/83±14 mmHg, pre-SUA 5.8±1.4 mg/dl, and pre-eGFR 59.3±16.7 ml/min/1.73m2 (mean±standard deviation). ΔSUA was correlated to ΔeGFR ($R=-0.47$, $P<0.01$) but not to pre-SBP, pre-SUA, pre-eGFR, andΔSBP in univariate analysis. Multivariate analyses also revealed that onlyΔeGFR was independently associated with ΔSUA ($p<0.01$) among age, sex, pre-SBP, pre-SUA, pre-eGFR,ΔSBP, and ΔeGFR.

Conclusions: Increase in SUA after initiation of low-dose thiazide diuretics was associated with decrease in eGFR. Decline in renal function may be the reason why low-dose thiazides failed to prevent coronary events in patients whose SUA increased in SHEP. Further studies are needed to elucidate that increased SUA is a cause or a result of decline in renal function.

PP.40.22 INVESTIGATION OF RELATIONSHIP BETWEEN URIC ACID AND METABOLIC SYNDROME IN THE GENERAL POPULATION

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Objective: Hyperuricaemia is a risk factor for cardiovascular diseases as well as gouty arthritis.The present study was designed to investigate a relationship between uric acid and metabolic syndrome or its components in the Japanese general population.

Design and method: Serum uric acid levels were measured in 8232 subjects (male=5255, mean age=56.6 years, range 20-91 years) who visited our hospital for a yearly physical checkup from January to December 2012 and a cross-sectional analysis was performed. The metabolic syndrome was defined according to the Japanese criteria (the presence of two or more of the following items in subjects with obesity; (1) elevated triglycerides and/or decreased high density-lipoprotein cholesterol, (2) elevated blood pressure, and (3) elevated fasting plasma glucose). Hyperuricaemia was defined as a serum uric acid level >= 6.0 mg/dL in female and >= 7.0 mg/dL in male subjects, or the use of medications for hyperuricaemia.

Results: Physical checkup revealed that 1510 subjects were with hyperuricaemia (male/female=24.9%/6.8%; among them, 32.2% and 4.9% in male and female subjects, respectively, were under anti-hyperuricaemic medications) and 1209 subjects with metabolic syndrome (male/female=19.8%/5.6%). Uric acid level and the prevalence of hyperuricaemia were significantly higher in subjects with (6.1±1.4mg/dL, 36.1%) than without metabolic syndrome (5.4±1.3mg/dL, 15.3%). The presence of metabolic syndrome was correlated with uric acid levels after adjustment for age, gender, serum creatinine and current smoking ($p<0.0001$). Multivariate regression analysis revealed that obesity, dyslipidemia, elevated blood pressure, and impaired glucose tolerance were independently correlated with uric acid levels. The uric acid level increased with increasing the number of the component of metabolic syndrome in each individual (without metabolic component, 4.9±1.2mg/dL; 1 component, 5.5±1.3mg/dL; 2 components, 5.8±1.3mg/dL; components>=3, 6.0±1.4mg/dL). Similar results were obtained in sub-analysis of subjects with normal uric acid levels (n=6716) or without any medications (n=5549).

Conclusions: Hyperuricemia was common in male subjects, but only few subjects in both male and female were under medical treatments. There was an independent relationship between uric acid and metabolic syndrome or its components, suggesting a pathophysiological role of uric acid in the development of cardiovascular disease.

PP.40.23 URIC ACID INDUCES KIDNEY EPITHELIAL-MESENCHYMAL TRANSITION: ROLE OF NLRP3 INFLAMMASOME

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Objective: Recently it has been demonstrated that hyperuricemia induces kidney epithelial-mesenchymal transition (EMT), an early state of renal fibrosis. NLRP3 inflammasome is part of the innate immune response that senses danger cellular signals and mediates an inflammatory response, activating caspasa-1 and finally increasing IL-1b and IL-18. Uric acid activates NLRP3 in vitro. The rol of NLRP3 inflammasome in EMT in hyperuricemic model is unknown.

Design and method: Male 200- to 250-g wistar rats during 49 days were fed ad libitum with standard normosodium diet (C group) (n=4), a second group (n=4) received the same normosodium diet with 2% oxonic acid and 2% uric acid suplements (OXUR group), and finally a third group (AL) received the supplemented hyperuricemic diet, plus allopurinol in drinking water (150 mg/L). At day 49 serum uric acid and blood urea were measured. Kidney material was taken and frozen for western blot (WB), a section was processed for transmission electron microscopy (EM) and finally fixation (4% paraformaldehyde) and paraffin inclusion was performed for immunohistochemistry (IHC) technique with peroxidase, using FSP-1 antibody (Abcam) to detect EMT on epithelial cells, NLRP3 (Santa Cruz) to evaluate the expression of inflammasome, and caspase-1 to measure the activity of inflammasome; we analyzed10 randomized areas at 400x from each animal. Caspasa-1 was measured on WB from total kidney tissue.

Results: OXUR group achieved higher plasma levels of uric acid (2,2±0,5 vs. 0,9±0,7 and 1,4±0,8 mg/dl; p<0,02) and urea (58,7±6 vs. 42±3 and 28,5±1,7; p<0,001) than C and AL group. EMT was confirmed on EM (figure) and on IHC showing more epithelial cell FSP-1+ in the OXUR group than CT (15,4±17 vs 2,6±4 cell/100 tubules; p<0,001). 69% of tubules (n=493) from OXUR group expressed NLRP3 on IHC, while 11% and 16% in the C and AL groups (p<0,001). Caspasa-1 in OXUR group was expressed in 32% of tubules (n=628) while 2% and 3% in the C and AL groups, respectively (p<0,001). This difference was confirmed on WB analysis (figure).

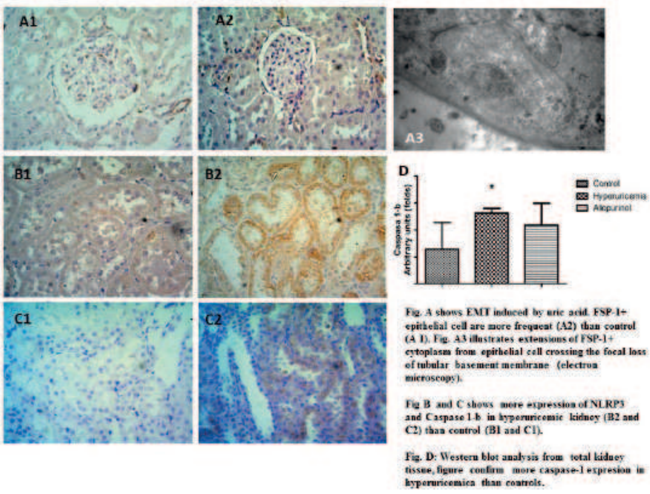

Fig. A shows EMT induced by uric acid. FSP-1+ epithelial cell are more frequent (A2) than control (A 1). Fig. A3 illustrates extensions of FSP-1+ cytoplasm from epithelial cell crossing the focal loss of tubular basement membrane (electron microscopy).

Fig B and C shows more expression of NLRP3 and Caspase 1-b in hyperuricemic kidney (B2 and C2) than control (B1 and C1).

Fig. D: Western blot analysis from total kidney tissue, figure confirm more caspase-1 expresion in hyperuricemica than controls.

Conclusions: NLRP3 inflammasome, via caspase-1 activation, would participate in kidney epithelial-mesenchymal transition induced by uric acid.

PP.40.24 RELATIONSHIP BETWEEN URIC ACID LEVELS AND SODIUM SENSITIVITY INDEX IN PATIENTS WITH ESSENTIAL ARTERIAL HYPERTENSION

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Objective: Some experimental and clinical studies have shown that high levels of uric acid (hyperuricemia) are one of the main causes of cardiovascular and kidney damage in essential arterial hypertension. Still, an open question remained – whether hyperuricemia plays a key role in initiation of salt-sensitive hypertension?
Having that in mind, the goal of this study was to examine correlation between level of uric acid in serum of patients with essential arterial hypertension and preserved kidney function; and index of sodium sensitivity, as the main parameter of salt-sensitive hypertension existence.

Design and method: The study included 178 patients of both sexes, aged averagely 59±18.2 years, with at least 5 years of hypertension history. Uric acid serum values were measured spectrophotometrically, using ERBA XL 600 automated analyser.
Sodium sensitivity index has been calculated from differences in 24 hours sodium excretion between period of sodium rich diet (250 mmol/24 hours) and sodium lean diet (100 mmol/24 hours), divided by mean arterial pressure, determined in the first and second measurement respectively.
The results were processed using Student's t-test and Pearson's Correlation in Microsoft Excel 2010.

Results: Based on uric acid serum values, patients were divided into 2 groups:
I group – 95 patients, with normal uric acid serum values (256±35 µmol/l);
II group – 83 patients, with statistically significant increase of uric acid serum values (572±49 µmol/l; p<0.01). Sodium sensitivity index in I group had normal values (0.026±0.005), while in II group it was significantly higher (0.078±0.02; p<0.01). This implies that in II group patients salt-sensitive hypertension was present. Comparison of uric acid serum level increase and salt-sensitivity index showed high positive correlation (r=0.721).

Conclusions: In patients with essential arterial hypertension and preserved kidney function, hyperuricemia and salt-sensitivity index correlate highly. This indicates that salt-sensitive arterial hypertension can be induced by prolonged hyperuricemia.

PP.40.25 SERUM URIC ACID IS ASSOCIATED WITH NON-DIPPING CIRCADIAN PATTERN IN YOUNG PATIENTS (30-40 YEARS OLD) WITH NEWLY DIAGNOSED ESSENTIAL HYPERTENSION

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Objective: Uric acid (UA) is independently associated with newly diagnosed hypertension. Nocturnal non-dipping pattern evaluated by the 24-hour ambulatory blood pressure monitoring (ABPM) is associated with a greater risk of cardiovascular, renal, and cerebrovascular complications than dippers. We aimed at evaluating the relationship between the circadian blood pressure rhythm and UA level in young patients (30-40 years old) with newly diagnosed essential hypertension.

Design and method: The study included 62 essential hypertensive patients and 29 healthy controls. The hypertensive patients were divided into two groups according to the results of 24-hour ABPM, including 30 dippers (20 men, 10 women; mean age 34±2 years) and 32 non-dippers (18 men, 14 women; mean age = 33±3 years).

Results: Compared to the dippers and to healthy controls, non-dippers had significantly higher serum UA levels (6.1±0.7, 5.2±0.9 and 4.1±0.9 mg/dl, respectively; P<.001). After adjusting for age, gender, body mass index, and comorbidity (history of cardiovascular disease, diabetes, hypercholesterolemia), multivariate logistic regression analysis revealed an independent association between serum UA levels and non-dipper pattern (odds ratio = 2.44; 95% confidence interval = 1.4-4.1; P = .002).

Conclusions: Serum UA is independently associated with non-dipper circadian pattern in young patients with newly diagnosed essential hypertension.

PP.40.26 THE ASSOCIATION OF URIC ACID WITH RISK OF HYPERTENSION IS MODULATED BY PHYSICAL ACTIVITY

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Objective: The association of uric acid with risk of hypertension is controversial and may be modulated by other risk factors. We did a prospective study to investigate whether uric acid was an independent predictor of risk of hypertension in the young and whether an unhealthy lifestyle could favour this association.

Design and method: The study was conducted in a cohort of 1060 young to middle age subjects screened for stage 1 hypertension and followed for a median of 11 years. In multivariable Cox analyses, data were adjusted for age, gender, body mass index (BMI), parental hypertension, 24-hour systolic and diastolic blood pressure, serum creatinine, lifestyle factors and metabolic data.

Results: At baseline uric acid showed an independent positive association with male gender, BMI, creatinine and metabolic data and a negative association with age and smoking. The uric acid level was 5.03 mg/dL in the sedentary subjects (n=659) and 5.00 mg/dL in the active subjects (p=n.s.). At follow-up end, 677 subjects developed hypertension needing treatment. In the whole group, uric acid was an independent predictor of future hypertension (p=0.004). Participants with uric acid > 5.60 mg/dL (lower limit of the top tertile) had a 31% increase in risk compared to those of the bottom tertile. However, the risk of hypertension related to uric acid was increased only among the sedentary subjects (p=0.0017) with a hazard ratio of 1.43 (95%CI, 1.10-1.88) for the subjects of the top uric acid tertile compared to those of the bottom tertile. In contrast, among the active subjects no association was found between uric acid and risk of hypertension (p=0.56). The association between uric acid and future hypertension remained virtually unchanged when baseline serum glucose, cholesterol and triglycerides were included in the regression models.

Conclusions: Uric acid is an independent predictor of hypertension in young to middle age subjects. However, regular physical activity prevents the development of hypertension related to hyperuricemia. These data suggest that exercise can counteract the pathophysiological mechanisms involved in the association between hyperuricemia and development of hypertension.

PP.40.27 HYPERURICEMIA AND REDUCED VITAMIN D ARE ASSOCIATED TO THE MICROVASCULAR DAMAGE ALONG THE ONSET OF THE METABOLIC SYNDROME

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Objective: Diminished vitamin D and elevated uric acid plasma levels have been associated to the onset of cardiovascular disease. Aim of the study was to highlight their association with the subclinical vascular damage in patients with a recent diagnosis of grade 1 primary hypertension.

pts/var	VitD	Uricemia	nATPIII	HOMA	PWV	CVC
NDNU	29.9±6.9	4.3±.8	1.9±.9	2.3±1.6	9.8±1.1	66.6±5.9
LDNU	6.5±4.3***	4.1±.8	2.1±1.2	2.6±1.6	10.1±1.3	47.6±1.3***
NDHU	31.3±9.1^^^	6.5±.8***^^^	2.6±1.2***^	2.9±1.6	10.2±1.2	46.2±1.2***^^^
LDHU	15.2±4.4***°°°	6.5±.9***^^^	2.5±1.1***^	3.7±2.1***^^	11.4±1.4***^^	41.5±3.1***^^^°°

Design and method: By means of insulin resistance (HOMA), factors of metabolic syndrome (nATPIII) and ABPM, 200 mild hypertensives (133±13/82±9), 70 with normal (N) Vit.D (D) and uricemia (U), 68 with reduced (L) D, 31 with high (H) U and 31 with both the disorders (LDHU) underwent to the arterial stiffness exam (PWV) and videocapillaroscopy of the medial and distal phalanx of the 2nd, 3rd and 4th finger of the non-dominant hand in venous congestion as index of structural microvascular damage (CVC).

Results: Patients showed a similar hypertensive state in the office and during ABPM. Data are showed as m±s.d.(*:p<.05, **:p<.01, ***:p<.001 vs NDNU; ^:p<.05, ^^:p<.01, ^^^:p<.001 vs LDNU;°p<.05, °°:p<.01, °°°:p<.001 vs NDHU).

Pearson test, adjusted for age and history of hypertension, showed a significant association between nATPIII and D (-.176*), U (.228**), PWV (.309**) and CVC (-.248**).

Conclusions: The findings suggest that the reduced Vit D and the hyperuricemia, per se, are associated to the structural microcirculatory damage along with the clustering of the factors of the metabolic syndrome before the onset of arterial stiffness. Later, the raised PWV is coupled with severe capillary rarefaction, insulin-resistance and both LD and HU.

PP.40.28 THE SIGNIFICANCE OF URIC ACID IN CARBOHYDRATE METABOLISM IN ESSENTIAL HYPERTENSIVE PATIENTS

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Objective: Aim of our study was to evaluate the relationship between uric acid levels with parameters of carbohydrate metabolism in essential hypertensive patients.

Design and method: We studied 2577 consecutive newly diagnose, treated or untreated, hypertensive patients (46% male, age 57 years, mean systolic/diastolic blood pressure: 156/98,7 mmHg, BMI 28,1 kg/m2, waist circumference: 96,3 cm), without overt cardiovascular disease. In all participants uric acid levels and parameters of carbohydrate metabolism (fasting glucose, insulin, c-peptide, HBA1c) were measured in venous blood sample. Moreover, in 897 participants oral glucose tolerance test was performed and HOMA-IR index was calculated.

Results: Results are shown in Tables 1-3.

Table 1. Comparisons between treated or untreated hypertensive patients

	Untreated	Treated	p value
Uric acid (mg/dl)	4,9±1,5	5,4±1,6	<0,001
Fasting glucose (mg/dl)	98,3±24	107,9±29	<0,001
insulin (mU/l)	12,3±12	12,6±12	NS
c-Peptide (ng/ml)	2,2±1,5	2,7±1,9	0,007
HBA1c (%)	5,55±1	5,97±1,1	<0,001
HOMA-IR	3±2,9	3,4±3,8	0,099

Table 2. Correlations between uric acid levels and parameters of carbohydrate metabolism

	Pearson r	p value
Fasting Glucose	0,084	<0,001
Insulin	0,121	0,001
c-Peptide	0,293	<0,001
HBA1c	0,980	0,002
HOMA-IR	0,118	0,001

Table 3. regression analysis with dependent variable uric acid levels

	P value
HBA1c	0,002
c-Peptide	0,013
HOMA-IR	0,015

Conclusions: In essential hypertensive patients uric acid levels are significantly dependent by parameters of carbohydrate metabolism and insulin resistance, possibly playing an important role in the development of metabolic syndrome or being part of the problem.

PP.40.29 PROGNOSTIC VALUE OF SERUM URIC ACID LEVELS TO THE CARDIOVASCULAR EVENTS IN HYPERTENSIVES

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Objective: Aim of the study was to investigate the role of serum uric acid levels to the cardiovascular events in hypertensive patients.

Design and method: This is a prospective analysis including 687 hypertensive patients (mean age at the entry: 55,5±11,9 years, mean office systolic/diastolic blood pressure: 149,8±21/93,1±12,3, mean office heart rate: 75,9±12 beats/min). The follow-up period was 9,6±6,3 years. Serum uric acid levels (UA) were measured at the entry of the study. Major cardiovascular events (MACE) (myocardial infarction, stroke, cardiovascular death) were registered. We estimated the prognostic value of UA to the MACE. Cox proportional hazard model were employed to determine the prognostic value of uric acid.

Results: The follow-up period was 9,6 years. There were 262 (38,1%) MACE at the end of the study. Cox regression statistical analysis revealed that uric acid was a predictor of MACE (HR: 1,13, 95%CI: 1,04 – 1,2, p-value=0,0038) (Table 1).

Table 1. Hazard ratio for uric acid in entire cohort

	Hazard ratio	95% Confidence Intervals	P value
Uric Acid	1,13	1,04 – 1,2	0,0038

Conclusions: Serum uric acid levels have prognostic value to major cardiovascular events in hypertensive patients.

PP.40.30 EFFECTS OF ALLOPURINOL ON RENAL FUNCTION DECLINE IN HYPERTENSIVE PATIENTS WITH CHRONIC KIDNEY DISEASES

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Objective: To evaluate retrospectively the effects of allopurinol treatment on renal function decline in non-gouty hyper- tensive patients with moderate-to-severe CKD.

Design and method: We selected 22 patients treated with allopurinol (A) (100–300 mg/die) that were compared with 44 subjects not treated with this drug (B), matched with A for esti- mated glomerular filtration rate (eGFR), age, gender and blood pressure values.

Results: After a mean follow-up period of 16 months no significant difference was observed between the two groups regarding eGFR decline (A: -6.8 ± 11.6 ml/min/1.73 m2; B: -4.2 ± 9.3 ml/min/1.73 m2). Furthermore, the per- centage of subjects with a value of eGFR reduction above the median was not significantly different in the two groups (A: 59 %; B: 41 %; p = 0.16). The absence of a significant effect of allopurinol on the eGFR decline was confirmed by the multiple logistic regression analysis, where the vari- ables associated with a greater eGFR reduction were the proteinuria and the baseline value of GFR.

Conclusions: Our findings are in disagreement with pre- vious studies showing a nephroprotective effect of allo- purinol. Further studies, with a randomized controlled design, are needed to understand whether or not pharma- cological treatment of asymptomatic hyperuricemia may preserve renal function.

PP.40.31 RELATIONSHIP BETWEEN ASYMPTOMATIC HYPERURICEMIA AND RENAL FUNCTION DECLINE IN HYPERTENSIVE SUBJECTS

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Objective: To evaluate retrospectively the relationship between asymptomatic hyperuricemia and renal function decline in non-gouty hypertensive patients.

Design and method: We enrolled 97 hypertensive subjects, 48 with chronic kidney diseases and 49 without CKD. Fifty-seven of them had normal serum uric acid level (lower than 7 mg/dl in men and 6 mg/dl in women) and 40 had hyper uricemia. Patients with hyper uricemia had higher systolic blood pressures and lower estimated glomerular filtration rate (eGFR) than N. At the end of follow-up period (mean: 16 months), eGFR reduction was similar in the two groups (N: -3.6 ± 12.3; U: -3 ± 13.4 ml/min/ 1.73 m2).

Results: Two-way ANOVA showed that this result was not influenced by renal dysfunction, diabetes, macroproteinuria, gender or smoking habit. The percentage of subjects with a value of eGFR reduction above the median was not significantly different in the two groups (N: 24.6 %; U: 27.5 %). The absence of a significant difference between the two groups, regarding the eGFR decline was confirmed by the multiple logistic regression analysis, where the variables associated with a greater eGFR reduction were only the proteinuria and the smoking habit.

Conclusions: Our findings do not support the hypothesis of a significant effect of asymptomatic hyperuricemia on the renal function decline in subjects with arterial hypertension.

PP.40.32 URIC ACID IS PREDICTIVE OF ALL-CAUSE AND CARDIOVASCULAR MORTALITY IN THE ELDERLY SUBJECTS: THE TAIPEI ELDERLY HEALTH EXAMINATION COHORT

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Objective: High serum acid (SUA) is suggested to be causally involved in the pathogenesis of vascular disease. The current study aimed to investigate whether SUA independently predicts all-cause and cardiovascular mortality in a large Taiwanese elderly cohort.

Design and method: In 2001, 43,594 Taipei City elderly citizens had received free Physical Health Examination (PHE) at hospitals in Taipei and had been followed up until the end of 2010. The PHE included medical history, physical examination and routine blood, urine and stool laboratory tests. Among them, 39,143 subjects agreed to participate in this study. There was a follow- up for all-cause and cardiovascular mortality with a mean duration of 8.5 years. Chi square and analysis of variance (ANOVA) were used to examine the association between covariates and SUA, as appropriate. Cox regression model was applied to evaluate the risk of all-cause and cardiovascular mortality across the quartiles of SUA while controlling for other covariates.

Results: During the follow-up period, 8368 (21.38%) died and 1376 died from cardiovascular disease. Body mass index, fasting glucose, cholesterol and triglyceride increased across the quartiles of SUA (Table 1). In contrast, glomerular filtration rate was inversely related to the quartiles of SUA. Adjusting for age and sex, subjects in the fourth SUA quartile had increased all-cause (hazard ratio (HR)=1.24; 95% CI:1.16-1.32) and cardiovascular (HR=1.46; 95% CI:1.25-1.70) mortality compared to individuals in the first quartile. These associations even stronger after including additional covariates such as BMI, fasting glucose, GFR, systolic pressure, total cholesterol and triglyceride into the model (Table 2).

Table 1: Baseline characteristics according to quartile of serum uric acid

	Serum uric acid quartile (mg/dL)				
	0.2-5.2	5.3-6.2	6.3-7.4	>7.4	P
Glomerular filtration rate (ml/min/1.73m2)	71.27±22.65	68.27±15.65	65.01±18.69	59.72±16.87	<0.0001
Body Mass Index (kg/m2)	23.44±3.23	24.04±3.22	24.50±3.17	25.01±3.18	<0.0001
Systolic pressure	139.43±25.00	134.88±19.06	135.62±23.28	135.60±25.38	<0.0001
Fasting glucose (mg/dL)	105.13±27.72	105.60±24.92	105.98±23.66	107.90±23.72	<0.0001
Total cholesterol (mg/dL)	198.73±35.80	198.99±35.58	199.49±35.43	200.69±35.90	0.0008
Triglyceride (md/dL)	109.12±59.54	117.77±62.76	124.93±66.00	140.28±72.11	<0.0001

Table 2: Mortality according to quartile of serum uric acid

Uric acid	Model 1		Model 2		Model 3	
Quartile	HR (95% CI)	P	HR (95% CI)	P	HR (95% CI)	P
1st	1.0 reference (all-cause)		1.0 reference		1.0 reference	
2nd	1.08 (1.02-1.15)	0.0144	0.99 (0.93-1.05)	0.7338	1.04 (0.96-1.12)	0.3423
3rd	1.12 (1.05-1.19)	0.0005	0.98 (0.92-1.04)	0.4968	1.10 (1.02-1.18)	0.0171
4th	1.46 (1.37-1.55)	<.0001	**1.24 (1.16-1.32)**	<.0001	**1.37 (1.27-1.48)**	<.0001
1st	1.0 reference (CVA)		1.0 reference		1.0 reference	
2nd	1.17 (0.99-1.37)	0.0611	1.06 (0.90-1.25)	0.4714	1.19 (0.98-1.45)	0.0778
3rd	1.29 (1.10-1.51)	0.0015	1.13 (0.97-1.33)	0.1256	1.35 (1.12-1.64)	0.0021
4th	1.71 (1.47-1.99)	<.0001	**1.46 (1.25-1.70)**	<.0001	**1.60 (1.32-1.94)**	<.0001

Conclusions: High SUA independently increased the risk for all-cause and cardiovascular mortality in Taiwanese elderly cohort receiving PHE.

PP.40.33 ASSOCIATION BETWEEN HYPERURICEMIA AND HYPERTENSION IN PATIENTS WITH ISCHEMIC HEART FAILURE. EFFECTS OF THIAZIDE DIURETICS

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Objective: Association between hyperuricemia and hypertension has been recognized a long time ago, with the prevalence of hyperuricemia of about 20-40% in hypertensive subjects. Diuretics, such as thiazides, increase serum uric acid which is the reason for rise in the prevalence of hyperuricemia up to 58% in hypertensive patients. Finding that ischemia results in an increase in uric acid levels may account for why uric asid could be increased in heart failure. Aim was to investigate the association of hyperuricemia to hypertension and diuretics use in patients with ischemic heart failure.

Design and method: This prospective research included 150 patients with heart failure of ischemic etiology, treated in Clinic of Cardiology, University Clinical Center Kragujevac from June 2010-June 2011. We collected anamnestic data on prior hypertension and use of antihypertensive therapy, and proof of thiazide diuretics use from therapy lists. Blood pressure was measured on admission after 5 minutes of rest in a supine position, to confirm the presence of hypertension. Serum uric acid was measured in local laboratory on admission and before discharge. All data were stored in a specially designed database, and statistically analyzed in the SPSS for Windows.

Results: Prior hypertension was present in 115 patients (76.7%; x2-test;p=0.000) with only 40% on prior antihypertensive therapy. Thiazide diuretics were applied in 113 patients (75.3%; x2-test;p=0.000). Serum uric acid was elevated in 76 patients (50.7%) in a total group (x2 test; p=0.027), with a mean value 455.39±154.7 μmol/L on admission. Subgroups of patients with prior hypertension, antihypertensive therapy, and diuretis had high uric acid in 69.7%, 35.5% and 76.3%. Levels increased during hospitalization to 468.08±160.07 μmol/L, so on discharge 81 patient (54%) had hyperuricemia with no statistical significance (paired t-test; p=0.104). Elevated serum uric acid was connected positively to prior hypertension and use of diuretics (Person's coeficient 0.166 and 0.023).

Conclusions: Hyperuricemia showed important association to hypertension in patients with ischemic heart failure with levels increasing during hospitalization, which can be attributed to a combination of ischemia, leading to heart failure, and use of thiazide diuretics which led to deterioration.

PP.40.34 ASSOCIATION BETWEEN SERUM URIC ACID, CAROTID ATHEROSCLEROSIS AND METABOLIC SYNDROME IN KOREAN POPULATION

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Objective: Metabolic syndrome indicates an increased cardiovascular risk. In addition, previous studies have suggested that hyperuricemia may be a risk factor for cardiovascular diseases. However, there are few data available on possible independent association between uric acid and carotid atherosclerosis. The objective of the present study was to access the association of uric acid with prevalence of carotid atherosclerosis according to gender and metabolic syndrome.

Design and method: The subjects consisted of 1132 patients who visited cardiology department at our hospital between 2007 and 2009. In all the subjects, we performed a survey on demographic and cardiovascular risk factors and determined blood pressure, body mass index, waist and laboratory, and echocardiographic parameters. This study was used ATP III definition for the metabolic syndrome.

Results: The patients were 567 men and 565 women (50:50%) with mean age of 61.4 years and mean body mass index of 24.5kg/m2. The prevalence of the metabolic syndrome was 42.8%, predominantly among women (women: 58.4%, men: 41.6%). The mean values of serum uric acid and carotid intima-media thickness (IMT) were 5.3 mg/dL (men: 5.7 mg/dL, women: 4.9 mg/dL, p<0.001) and 0.80 mm (men: 0.77 mm, women: 0.82 mm, p=0.004). After adjusting for age, gender, smoking status, total cholesterol, C-reactive protein, renal function and ejection fraction, the odds ratios (95% CI, p value) of serum uric acid and carotid IMT for metabolic syndrome were 1.26 (1.13-1.40, p<0.001) and 3.43 (1.85-6.35, p<0.001). According to gender, the adjusting the odds ratios (95% CI, p value) of serum uric acid and carotid IMT for metabolic syndrome were 1.26 (1.08-1.48, p=0.003) and 4.92 (1.89-12.79, p=0.001) in women, in addition, 1.29 (1.12-1.50, p=0.001) and 2.53 (1.10-5.79, p=0.028) in men.

Conclusions: There was higher prevalence of metabolic syndrome as expected in Korean population. The prevalence of metabolic syndrome showed an increase according to serum uric acid values and carotid IMT in both genders. The metabolic syndrome might be significantly associated with hyperuricemia and carotid atherosclerosis.

PP.40.35 SERUM URIC ACID IS ASSOCIATED WITH CORONARY ARTERY CALCIFICATION

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Objective: Uric acid (UA) is associated with coronary artery disease. Coronary artery calcium (CAC) is a marker of atherosclerotic disease and a predictor of cardiovascular events. The aim of the present study is to evaluate whether UA levels are associated with CAC.

Design and method: The study included 663 asymptomatic subjects (564 males, mean age 55+7 years) who underwent a routine evaluation for the presence of CAC with ungated dual slice computed tomography (CT) between the years 2001-2002. Data on patient's medical history, physical examination and laboratory evaluations including UA levels were collected. Study population was divided into three tertiles according to their UA levels and the prevalence of CAC was compared between the tertiles.

Results: Coronary artery calcium was detected in 349 (53%) subjects. Levels of UA were significantly higher in those with than in those without CAC (5.6 + 1.2 vs. 5.3 + 1.3; p = 0.003). The rate of CAC was significantly higher in the highest UA tertile than in the lowest tertile (59% vs. 46%; p = 0.005). The odds ratio for the presence of CAC in the highest vs. lowest UA tertile was 1.72 [95% confidence interval (CI), 1.17-2.51]. After adjusting for age, gender, hypertension, diabetes mellitus, hyperlipidemia, body mass index, creatinine levels, the highest UA tertile was associated with the presence of CAC with an odds ratio of 1.84 (95% CI 1.1-3.07).

Conclusions: Increasing serum UA levels are associated with the presence of CAC.

PP.40.36 SERUM URIC ACID AND ARTERIAL STIFFNESS IN HYPERTENSIVE CHRONIC KIDNEY DISEASE PATIENTS: GENDER-SPECIFIC VARIATIONS

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Objective: Hyperuricemia and arterial stiffness are associated with increased cardiovascular risk. Specific relationship between arterial stiffness and serum uric acid (SUA) in chronic kidney disease (CKD) patients has not been investigated. We investigated whether SUA level is associated with arterial stiffness in hypertensive CKD patients.

Table1 . Association of PWV and AIx@75 with serum uric acid in the study population.

Parameter	Whole Population			Female			Male		
	β	95 % CI	P	β	95 % CI	P	β	95 % CI	P
24-hour AIx@75 (%)									
Unadjusted	-0.192	-1.567-(-0.458)	<0.001	0.053	-0.018-0.039	0.467	-0.186	-0.067-(-0.005)	0.024
Adjusted*	-0.158	-1.467-(-0.186)	0.012	-0.046	-1.222-0.766	0.652	-0.299	-2.507-(-0.557)	0.002
Daytime AIx@75 (%)									
Unadjusted	-0.204	-1.608-(-0.514)	<0.001	0.016	-0.025-0.032	0.827	-0.188	-0.067-(-0.005)	0.023
Adjusted*	-0.147	-1.412-(-0.114)	0.021	-0.035	-1.177-0.825	0.728	-0.292	-2.498-(-0.506)	0.003
Nighttime AIx@75 (%)									
Unadjusted	-0.133	-1.564-(-0.174)	0.014	0.131	-0.002-0.043	0.070	-0.164	-0.050-(-0.001)	0.047
Adjusted*	-0.160	-1.823-(-0.269)	0.008	-0.040	-1.425-0.916	0.668	-0.272	-2.960-(-0.575)	0.004
24-hour PWV (m/s)									
Unadjusted	0.223	0.109-0.307	<0.001	0.280	0.134-0.398	<0.001	0.071	-0.105-0.262	0.398
Adjusted*	-0.019	-0.078-0.043	0.570	-0.015	-0.115-0.083	0.753	-0.023	-0.111-0.070	0.657
Daytime PWV (m/s)									
Unadjusted	0.221	0.107-0.305	<0.001	0.271	0.125-0.391	<0.001	0.075	-0.100-0.266	0.372
Adjusted*	-0.022	-0.081-0.041	0.521	-0.022	-0.121-0.076	0.654	-0.018	-0.107-0.076	0.732
Nighttime PWV (m/s)									
Unadjusted	0.220	0.108-0.308	<0.001	0.298	0.0149-0.409	<0.001	0.054	-0.122-0.239	0.524
Adjusted*	-0.023	-0.085-0.043	0.521	0.004	-0.101-0.110	0.931	-0.044	-0.134-0.054	0.398

S.E.; Standard error, CI; Confidence interval. AIx@75, Augmentation index adjusted for heart rate, PWV; Pulse wave velocity.

*Adjusted for age, gender (only for whole population analysis), smoking, diabetes mellitus, coronary artery disease, cerebrovascular disease, peripheral arterial disease, use of statin and antihypertensive drugs, total cholesterol and triglyceride, urinary protein excretion rate and estimated glomerular filtration rate.

Design and method: Study had a single-center, cross-sectional design. Methods: 339 hypertensive CKD patients (female/male; 192/147, mean age; 57.9±13.9 years) were recruited. Arterial stiffness was assessed by pulse wave velocity (PWV) and augmentation index adjusted for heart rate (AIx@75).

Results: SUA was negatively correlated nighttime wave reflection magnitude (P:0.015), 24-hour AIx@75 (P<0.0001), daytime AIx@75 (P<0.0001) and nighttime AIx@75 (P:0.014), and was positively correlated with 24-hour PWV (P<0.0001), daytime PWV (P<0.0001) and nighttime PWV (P<0.0001). SUA was negatively correlated with 24-hour AIx@75 (P:0.024), daytime AIx@75 (P:0.023) and nighttime AIx@75 (P: 0.047) in males, whereas SUA was positively correlated with 24-hour PWV (P<0.0001), daytime PWV (P<0.0001) and nighttime PWV (P<0.0001) in females. In adjusted analysis, SUA was independently associated with AIx@75, but not with PWV. In gender-specific unadjusted analysis, SUA was significantly associated with PWV only in females, which lost significance in adjusted analysis. SUA was significantly associated with AIx@75 in only males, which remained significant after adjustment for confounders.

Conclusions: In hypertensive CKD patients, SUA was correlated with the two indices of arterial stiffness, PWV and AIx@75, with gender-specific variations. However, SUA was independently associated with only AIx@75, but not with PWV, in the whole patient population and only in males.

PP.40.37 URIC ACID PREDICTS LONGITUDINAL BLOOD PRESSURE INCREASE AND NEW-ONSET HYPERTENSION IN THE GENERAL POPULATION

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Objective: Hyperuricaemia is highlighted as a proposed risk factor for cardiovascular diseases. We recently reported that uric acid is a risk factor for reduced glomerular filtration rate and that reduction in glomerular filtration rate promotes an increase in blood pressure in the general population. Thus, hypertension may underlie the pathway from hyperuricaemia to cardiovascular disease. The present study therefore investigated whether uric acid levels could be a predictor of the longitudinal increase in blood pressure and the future development of hypertension in the general population.

Design and method: Normotensive individuals (50.7 ± 12.2 years old, n = 8157) were enrolled in the present study. After baseline evaluation, subjects were followed-up for a median of 4 years with the endpoint being the development of hypertension. The impact of uric acid at baseline on the longitudinal increase in blood pressure and the future development of hypertension was assessed.

Results: The actual follow-up period of the present study was 32478 person-years. During the follow-up period, hypertension developed in 2074 subjects (25.4%; 63.9 per 1 000 person-years) with a higher incidence in males (29.5%; 73.2 per 1000 person-years) than in females (19.0%; 48.8 per 1000 person-years). Incident hypertension was increased across the quartiles for baseline uric acid levels ($p < 0.0001$). In multivariate Cox proportional hazards analysis where the baseline uric acid concentration was taken as a continuous variable, uric acid was an independent predictor of the development of hypertension in both male and female subjects ($p < 0.05$). Furthermore, uric acid was independently correlated with the longitudinal increase in blood pressure ($p < 0.05$).

Conclusions: The uric acid level is an independent predictor of future blood pressure and new-onset hypertension in both men and women in the general population. This suggests that uric acid plays a pathophysiological role in the development of hypertension.

PP.40.38 SERUM URIC ACID RELATES WITH EJECTION FRACTION IN ELDERLY OUTPATIENTS AFFECTED BY HYPERTENSION RELATED CHRONIC HEART FAILURE

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Objective: An increasing body of evidence suggest that serum uric acid (SUA) is a cardiovascular disease risk factor, however only preliminary data support the hypothesis that it could be also involved in the prognosis of chronic heart failure. Our aim was to evaluate the relationship between SUA and left ventricular ejection fraction (EF) in a large cohort of outpatients affected by hypertension related heart failure.

Design and method: For this study, from the general cohort of patients followed by the heart failure outpatient clinic of the Bologna University Hospital, we consecutively selected 487 outpatients affected by hypertension related heart failure (M= 291, 59.8%; F= 196, 40,2%; mean age: 72±11 years old).

Results: In an univariate analysis SUA appears to have an inverse strong relationship with EF: B= -4.392, 95%CI -5,427 - -3,357, p<0.001). When including in a multivariate analysis age, BMI, medium arterial pressure (MAP), heart rate, haemoglobin, fasting plasma glucose, LDL-cholesterol, HDL-cholesterol, and creatinine, the model best predicting FE included only SUA (B= -3.005, 95%CI -4,386 - -1,623, p<0.001) and MAP (B= 0.241, 95%CI 0,047 - 0,435, p=0.015). Repeating the analysis by sex, we confirmed that SUA was a significant strong predictor of EF in men, but not in women (where MAP and BMI were the best predictors). Repeating the analysis on the basis of the obesity level, we did not find any difference in the ability of SUA to predict EF in slim patients as in obese ones.

Conclusions: SUA seems to be inversely related to EF in elderly patients affected by heart failure, after correction for a large number of clinical variables, especially in men.

PP.40.39 SERUM URIC ACID AND MARKERS OF LDL-OXIDATION IN A LARGE SAMPLE OF OVERALL HEALTHY SUBJECTS: DATA FROM THE BRISIGHELLA HEART STUDY

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Objective: Serum uric acid (SUA), an inexpensive and standardized marker of systemic oxidative stress, has been recently associated to the risk to develop atherosclerosis-related cardiovascular events. Our aim was to evaluate the eventual relationship between SUA, oxidized LDLs and LDL susceptibility to oxidation in a relatively large sample of non-smokers healthy subjects.

Design and method: We selected from the general database of the Brisighella Heart Study a sample of 354 non-smokers and non-pharmacologically treated young subjects (age included between 20 and 55 years), in primary prevention for cardiovascular disease, without known allergic nor rheumatological disease (including gout), not assuming antioxidant dietary supplements, visited during the 2008 population survey. A full set of clinical and ematochemistry parameters has been evaluated together with oxidative susceptibility of LDL and oxidized LDL dosage level.

Results: In the multivariate analysis, the LDL lag phase was inversely related to apo B (B= -0.166, 95%CI -0.259 - -0.073, p= 0.001) and FPG (B= -0.254, 95%CI -0.471 - -0.037, p= 0.022). The propagation phase was directly related to age (B= 0.117, 95%CI 0.025 - 0.209, p= 0.013) and inversely to TG (B= -0.021, 95%CI -0.038 - -0.004, p= 0.015). The dienes level was directly related to LDL-C (B= 0.685, 95%CI 0.347 - 1.023, p<0.001), SUA (B= 2.201, 95%CI 1.117 - 5.285, p<0.001) and ApoB (B= 0.717, 95%CI 0.404 – 1.031, p<0.001) level. The oxLDL level was directly related to apo B (B= 0.077, 95%CI 0.015 - 0.139, p=0.016), TG (B= 0.050, 95%CI 0.032 - 0.069, p<0.001), LDL-C (B= 0.102, 95%CI 0.052 - 0.153, p<0.001) and SUA (B= 1.106, 95%CI 0.405 - 1.807, p=0.002).

Conclusions: In a sample of healthy subjects SUA is a significant predictor of ox-LDL and dienes level, but not of LDL lag phase and propagation phase.

PP.40.40 SERUM URIC ACID AND OTHER SHORT-TERM PREDICTORS OF ECG ALTERATIONS IN A LARGE SAMPLE OF GENERAL POPULATION: A 4-YEAR FOLLOW-UP OF THE BRISIGHELLA HEART STUDY HISTORICAL COHORT

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Objective: Recent studies show an involvement of SUA as a significant predictor of atrial fibrillation. while its association with other kind of arrhythmias is not yet established. We aimed to evaluate the incidence of the most common electrographic alterations in a large sample of general population and their association with SUA.

Design and method: We selected a Brisighella Heart Study cohort sample of 1557 subjects (M: 47,3%, F: 52,7%), consecutively visited in the 2004 and 2008 population surveys, in a setting of primary prevention for cardiovascular disease and without a known diagnosis of arrhythmia or left ventricular hypertrophy, excluding subjects affected by gout or taking any antihyperuricemic agent or drugs able to interfere with the QT interval, as well as beta-blockers or non-dihydropyridine calcium channel blockers. A step-wise Cox regression analysis was used to determine the independent prognostic significance of age, gender, physical activity, smoking habit, BMI, FPG, mean arterial pressure, heart rate, LDL-C, HDL-C, TG, SUA and eGFR for ECG alterations on a 4-year follow-up.

Results: No one of the considered variables was associated with the incident diagnosis of sinus tachycardia, and sinus bradycardia. Predictors of incident tachyarrhytmias were age (OR 1,08, 95%CI 1,02-1,14, p=0.010), women sex (OR 1,31, 95%CI 1,12-1,86, p=0.022), active smoking (OR 1,18, 95%CI 1,03-1,38, p=0.009) and SUA (OR 1.05, 95%CI 1.01-1.09, p=0.042). Incident ECG signs of previous myocardial infarction were predicted by male sex (OR 1,49, 95%CI 1,18-1,98, p=0.002), active smoking (OR 1,33, 95%CI 1,14-1,59, p=0.004), LDL-Cholesterol (OR 1,29, 95%CI 1,07-2,11, p=0.021) and SUA (OR 1,12, 95%CI 1,01-1,28, p=0.039). Predictors of incident ECG-diagnosed left ventricular hypertrophy were BMI (OR 1,19, 95%CI 1,01-1,26, p=0.041), MAP (OR 1,49, 95%CI 1,22-2,03, p=0.009), and SUA (OR 1,39, 95%CI 1,13-1,88, p=0.019).

Conclusions: In a cohort of general population, SUA seems to be a significant middle-term predictor of electrocardiographically diagnosed myocardial infarction, left ventricular hypertrophy and tachycarrhytmias.

PP.40.41 THE SELECTIVE EFFECT OF LOSARTAN ON URIC ACID DEPENDIG ON ITS INITIAL SERUM LEVEL

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Objective: To examine influence of losartan and its combination with different doses of hydrochlorothiazide (HTZ) on serum uric acid level in hypertensive patients in primary care practice.

Design and method: The open multicenter clinical study LAURA (Losartan And URic Acid) was performed by 98 primary care physicians in 25 cities of Ukraine. The study included 505 outpatient patients, including 165 men (33%) and 340 women (67 %) (mean age 60,9±5,0 years). Losartan was assigned for 170 pts at a mean dose 78,5 mg/day, losartan 50 mg/HTZ 12,5 mg - for 235 pts, losartan 100 mg / HTZ 25 mg - for 100 pts. Serum uric acid level was examined before and after one and three months of treatment. The effectiveness of therapy was evaluated by monitoring of the office blood pressure.

Results: The initial serum uric acid level in patients with normouricemia was 291,7±3,5 mmol /L. In one and three months of therapy losartan has not changed it significantly: 298,4±4,3 mmol/L and 293,6±4,4 mmol/L, respectively ($p>0,05$ in both cases). In hyperuricemic patients a significant decrease of serum uric acid level was stated - from 445,7±8,0 mmol/L to 396,4±8,9 mmol/L ($p<0,001$) after 1 month of therapy and up to 387,4±8,3 mmol/L ($p<0,001$) at the end of the observation. Positive effect of losartan on uric acid levels was observed not only under losartan monotherapy. Combination of losartan with different doses of HTZ did not increase serum uric acid level, on the contrary, in one and three months of therapy slightly decreased it ($p>0,05$). Losartan and its combination with different doses of HTZ significantly decreased blood pressure in one and three months of treatment ($p<0,001$ in all cases).

Conclusions: Losartan has the selective effect on serum uric acid depending on the initial value of it: the drug did not reduce the normal level of uric acid, but if it was elevated losartan produced a pronounced hypouricemic effect. Our data suggest that losartan may prevent the HTZ induced hyperuricemia.

POSTERS' SESSION

POSTERS' SESSION PS41

SPORT EXERCISE AND BLOOD PRESSURE

PP.41.01 ENDURANCE EVALUATING THE CONCEPT OF CRITICAL POWER-MEASUREMENT TO PREDICT TRAINING SUCCESS IN PATIENTS WITH ARTERIAL HYPERTENSION

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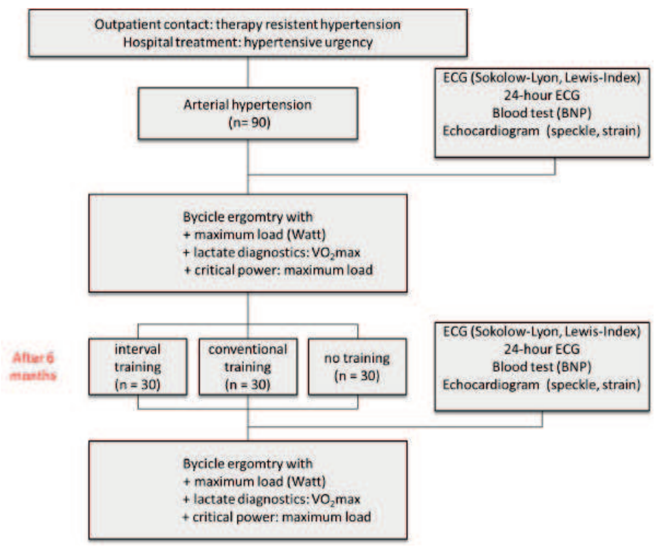
Objective: Epidemiological studies suggest a positive effect of regular physical activity on preventing and treating arterial hypertension. Reduced physical activity elevates cardiovascular risk and mortality.

The concept of critical power used in physical performance diagnostics may perform as a predictive parameter for training success in patients with arterial hypertension.

The critical power concept developed by Monod & Scherrer (1965) describes the maximum power depending on the load duration. Hence the performance of a test person can be predicted for a certain load over a certain time by identifying the individual anaerobic threshold through monitoring lactate concentrations during exercise and then applying a certain mathematical algorithm. This concept has been previously evaluated for athletes. Our approach aims at using this concept for predicting training success for patients with hypertension.



PP.41.02 BLOOD PRESSURE RESPONSE TO EXERCISE TESTING IN CHILDREN

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Objective: Observational epidemiologic studies and numerous clinical trials reveal that physical activity is associated with reduced blood pressure, and is therefore a a key component for the prevention and treatment of hypertension in children and adolescents. The purpose of this study was to assess blood pressure changes in children and adolescents who were involved in competitive sports and those who were not physically active, before, during and after excersie testing.

Design and method: The subjects included in the study consisted of 17 sportspersons and 10 non-athletic students with aged 10-17 years. Blood pressure (BP) at the right arm was measured in sitting position at 5 minutes before, 6 minutes after starting physical activity and 5 minutes after the end of the exercise. Weight, height, body mass index (BMI), mean arterial pressure (MAP) and pulse pressure (PP) were measured by ordinary methods. Data was analyzed using student's t- test. Results were expressed as mean ± SD. The statistical difference was considered significant at $P < 0.05$.

Results: The results showed that while systolic BP (SBP) increased during and 5 minutes after the end of physical exercise in both groups, diastolic BP (DBP) decreased. However, SBP values were significantly lower in the non-athletic group compared to the athletes. On the other hand, DBP values were significantly lower in athletic group compared to non-athletes. Moreover, heart rate values were significantly lower at rest, during and 5 minutes after the end of physical exercise in athletic group compared to non-athletes.

Conclusions: Our results revealed that physical activity reduced arterial BP levels in children involved in competitive sports.

PP.41.03 ADMA LEVELS PREDICT EXAGGERATED BLOOD PRESSURE RESPONSE TO EXERCISE

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Objective: Asymmetric dimethylarginine (ADMA), an endogenous inhibitor of nitric oxide production, has been demonstrated to have a dual role in cardiovascular disease serving as both a mediator and a biomarker. The purpose of this study was to assess the correlation between ADMA and treadmill stress test blood pressure response in patients with intermediate risk for coronary artery disease (CAD).

Design and method: Study participants were individuals without a history of atherosclerotic disease, referred to our hospital with symptoms of suspected CAD and evaluated with a treadmill exercise stress test (EST). ADMA levels were measured before EST. Exaggerated blood pressure response (EBPR) was defined as systolic BP >= 200 mmHg or the diastolic BP >=100 mmHg at peak exercise.

Results: Study population consisted of 209 individuals (165 males, 58.1 ±10.9 years old). Significant correlations were detected between ADMA levels and EBPR ($r=0.166$, $p=0.016$), maximal exercise time ($r=-0.556$, $p<0.001$), METs achieved ($r=-0.555$, $p<0.001$) and DTS ($r=-0.347$, $p<0.001$). In the subgroup analysis, subjects with exaggerated BP response (EBPR) (n=20) had statistically significant lower ADMA levels (0.67 ± 0.17 vs 0.77 ± 0.17 μmol/l, $p=0.016$) in contrast to those with normal BP response (n=189) at the ESCT. Multivariate analysis revealed that ADMA remained an independent predictor of EBPR ($R2=0.272$; beta=0.280; 95% confidence interval 0.035 to 0.525; $p=0.025$) after adjustment for age, BMI, gender, diabetes, smoking status and family history of premature CAD.

Conclusions: ADMA levels are correlated to EBPR and are an independent predictor of EBPR. This implies that ADMA itself may play a key role in the pathophysiology of EBPR to exercise.

PP.41.04 THE PROGNOSTIC VALUE OF OXYGEN KINETICS DURING EARLY RECOVERY AFTER EXERCISE IN HYPERTENSIVE PATIENTS WITH IMPAIRED CORONARY FLOW RESERVE

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Objective: Eighty (80) non-diabetic, recently diagnosed and well-controlled hypertensive patients (mean age 51+11 years, 55 men) underwent a ramp symptom-limited cardiopulmonary exercise test (CPET) on a bicycle ergometry. We evaluated exercise parameters (work load, O2 pulse and VE/VCO2 slope) as well as oxygen kinetics during exercise (peak oxygen consumption [peak VO2]) and early recovery period (slope of VO2 decline during the first minute of recovery, VO2rec). Coronary flow reserve, which was estimated before CPET, was measured by means of color-guided Doppler echocardiography at the distal tract of the left ascending coronary artery after adenosine infusion (140 mg/kg/min). The study group was divided according to CFR values to group A (n=57, normal CFR>2) and group B (n=23, impaired CFR<2.0).

Design and method: The period of early recovery after exercise is characterized by a rapid payback of the oxygen debt incurred during exercise which in turn reflects normal circulatory function. Hypertension may be accompanied by impaired coronary microcirculation. We hypothesized that oxygen consumption (VO2) during exercise as well as its decline during the first minute of recovery after exercise will be impaired in hypertensive patients with reduced coronary flow reserve.

Results: No significant differences were found between groups regarding age, body mass index and systolic and diastolic blood pressure at rest. All patients completed successfully the exercise test without ECG signs or symptoms of myocardial ischemia. Regarding total population, VO2rec was strongly related with peak VO2 (r= 0.72, p<0.001), work load (r= 0.70, p<0.001), O2 pulse (r= 0.70, p<0.001) and VE/VCO2 slope (r= -0.20, p<0.05). We found that patients in group B had lower work load (146+46 vs. 122+38 watts, p<0.05), peak VO2 (2053+570 vs. 1798+455 ml/min, p<0.05) while VO2rec was significantly slower (816+374 vs. 634+258, p<0.01).

Conclusions: Hypertensive patients with impaired coronary microcirculation achieve reduced peak exercise parameters (work load, oxygen consumption, and oxygen recovery). Cardiopulmonary exercise test may be a useful tool in cardiovascular risk estimation in hypertensive population.

PP.41.05 IMPACT OF SHORT-TERM EXERCISE TRAINING AND RESIDUAL ISCHEMIA ON ARTERIAL BLOOD PRESSURE, DOUBLE PRODUCT AND QT DISPERSION IN PATIENTS AFTER CORONARY ARTERY BYPASS GRAFTING

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Objective: The aim of this study was to establish the influence of short-term exercise training and residual ischemia (RI) on arterial blood pressure (BP), double product (DP) and QT dispersion, in patients after coronary artery bypass grafting (CABG).

Design and method: The study involved 172 patients after CABG (mean age 57.3 years). Patients were randomly divided into the physical training group (TG: 133 patients) and non-training group (NTG: 39 patients). In all subjects exercise test, were performed and after that TG patients were included in program of physical training for three weeks, using the bicycle ergometer (10 min, 2 times a day) and walking.

Results: RI was present in 29 (21.8%) patients in the TG and in 9 (23.1%) patients in the NTG. In the TG, before starting with the program of physical training, patients with RI had significantly higher values of QTdc (p<0.005), while the values of systolic and diastolic BP and DP did not significantly vary in comparison to those without RI. After three weeks, in the TG patients with RI, we have found significant reduction of systolic BP from 138.9 ± 11.8 to 132.8 ± 10.6 mmHg (p<0.05), of diastolic BP from 89.0 ± 6.8 to 84.8 ± 7.9 mmHg (p<0.05), of DP from 11752.6 ± 653.8 to 11390.5 ± 492.7 beat/min x mmHg (p<0.02) and of QTdc from 55.6 ± 13.4 to 48.8 ± 12.5ms (p<0.05). In the TG patients without RI, after three weeks, we have found significant reduction of systolic BP from 137.9 ± 13.6 to 130.1 ± 8.9 mmHg (p<0.001), of diastolic BP from 88.2 ± 9.0 to 82.9 ± 6.3 mmHg (p<0.001), of DP from 11505.3 ± 724.4 to 10124.5 ± 529.6 beat/min x mmHg (p<0.001) and of QTdc from 47.2 ± 16.8 to 39.6 ± 15.9ms (p<0.001). In contrast, the NTG showed no significant changes.

Conclusions: The study showed that short-term exercise training has favourable effects on arterial BP, DP and QTdc in patients after CABG, especially in those without RI. Physical training led to the significant decrease of myocardial oxygen uptake at rest and myocardial vulnerability.

PP.41.06 AMBULATORY HYPOTENSIVE EFFECT OF PHYSICAL TRAINING: A REAPPRAISAL THROUGH A META-ANALYSIS OF SELECTED MODERATORS

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Objective: The effectiveness of chronic exercise to decrease both systolic and diastolic blood pressure (SBP and DBP) is well established. However, this hypotensive effect may be altered by a number of variables including the participants' characteristics, the physical activity program characteristics and other co-interventions including diet or medication. Therefore, the purpose of this study was to assess the effect of these moderators on ambulatory blood pressure (BP) through a meta-analysis of the existing literature.

Design and method: Three databases were searched using relevant terms and strategies (from 1945 to 2013-Oct-19). Twenty-eight studies from 676 identified records met following inclusion criteria: randomized controlled trials with quality score using PEDro scale or van Tulder scale >=5, presence of relevant details about training intervention and subjects' characteristics, and pre and post-training measurements of ambulatory blood pressure (ABPM).

Results: The overall effect -of physical activity programs- was a weighted mean difference reached for day-time systolic / diastolic ABPM -3.82/-3.29 mmHg (95% CI -5.15 to -2.49 and -4.59 to -1.99 respectively; P<0.01). Moderators associated with ABPM improvement were the following: an initial casual BP >=140/90 mmHg (hypertensive or uncontrolled BP subjects), diet co-intervention, training program duration >12 weeks, and cumulative number of exercises >40 sessions. These improvements were significant or higher for day-time SBP than other BP variables. We found no differences for gender, age, or presence of antihypertensive drugs.

Conclusions: Antihypertensive effects of aerobic training assessed by ABPM appear modest but significant, and our meta-analysis highlights favorable moderators as initial high BP, diet, and training cumulative duration.

PP.41.07 EXAGGERATED BLOOD PRESSURE RESPONSES TO EXERCISE STRESS TESTING AT MODERATE INTENSITY: A WARNING SIGNAL TO DOCTORS ON THE PRESENCE OF HYPERTENSION

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Objective: Patients with exaggerated blood pressure (BP) responses during exercise stress testing at moderate intensity have increased cardiovascular mortality. It has been hypothesized that exaggerated BP responses may be indicative of the presence of hypertension (thus explaining increased mortality risk), but this has never been examined in unselected patients and was the aim of this study.

Design and method: Participants were 100 consecutive patients (age 56±9 years, 30% female) undergoing a clinically indicated exercise stress test who were free from coronary artery disease. Exercise BP was recorded at each stage of the Bruce protocol and BP control was determined by 24-hour ambulatory BP monitoring. Resting BP was recorded at seated rest in duplicate. Hypertension was defined as 24-hour systolic BP >=130 mmHg or daytime systolic BP >=135 mmHg.

Results: Independent of age, sex, and resting systolic BP, patients with exercise systolic BP >=150 mmHg at stage 1 or stage 2 of the exercise stress test had significantly higher 24-hour systolic BP (140±10 vs 120±7 mmHg; p<0.001), daytime systolic BP (147±10 vs 125±7 mmHg; p<0.001) and prevalence of hypertension (74% vs 37%; p<0.001) compared to those with exercise systolic BP <150 mmHg. Furthermore, exercise systolic BP at stage 1 of the exercise stress test independently predicted the presence of hypertension on logistic regression analysis with same model variables as above (Wald statistic 5.0; 78% sensitivity; 73% accuracy; p=0.026).

Conclusions: Irrespective of resting BP, a systolic BP >=150 mmHg at stages 1 or 2 of an exercise stress test is strongly associated with the presence of hypertension. Thus, exaggerated exercise BP should be a warning signal to doctors to provide appropriate follow up of these patients and reduce cardiovascular risk related to BP.

PP.41.08 BREATHING TRAINING MODULATES THE BLOOD PRESSURE RESPONSES TO EXERCISE IN STABLE HYPERTENSIVE PATIENTS

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Objective: To determine the effect of slow breathing training on the cardiovascular responses to exercise of an untrained muscle.

Design and method: Twenty controlled hypertensive subjects trained for 8 weeks, 10 with unloaded slow breathing (Sham) and 10 breathing against an inspiratory load of 20 cm H2O (Load). Ten subjects were untrained Controls. Subjects performed a 2 minute handgrip test (30% max) before and after training, measuring blood pressure and heart rate (HR) before the contraction, at the end and following 2 minutes recovery. Heart rate variability (HRV) was measured at rest before and after training.

Results: Resting systolic (sBP) and HR were reduced as a result of training, as reported previously. After training there was both a smaller blood pressure response to handgrip exercise and a more rapid recovery of sBP and HR compared to before training. There were no changes in the Controls and no differences between the Sham and Load groups, indicating that slow breathing rather than respiratory work was the important factor. Combining the two training groups, the sBP response to handgrip exercise after training was reduced by 10 mmHg (95% CI: 7, 13) and HR by 5 bpm (95% CI: 4, 6), all $p<0.05$. HRV showed a shift to higher spectral frequencies following training (LF/HF 1.07± 0.54 before and 0.81± 0.35 after training: $p = 0.019$).

Conclusions: Slow breathing training reduces the blood pressure and heart rate responses to contraction of muscles that have not been trained. This indicates that slow breathing training can modify central mechanisms regulating cardiovascular function.

PP.41.09 EFFECTS OF EXERCISE TRAINING ON HYPERTENSION AND RENAL FUNCTION IN DAHL SALT-SENSITIVE RATS

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Objective: Exercise training (Ex) has antihypertensive and renoprotective effects in humans and rats with hypertension and chronic kidney disease. Since little has been reported on effects of Ex on salt-sensitive hypertension and concomitant renal disorder, we investigated effects of Ex on blood pressure and renal function in Dahl salt-sensitive (Dahl-S) rats.

Design and method: Six-week-old male Dahl-S rats were divided into four groups: 1) normal salt (0.6% NaCl) diet (NS) (NS-Sed group, n=10), 2) NS plus Ex (NS-Ex group, n=10), 3) high salt (8% NaCl) diet (HS) (HS group, n=11), 3) HS plus Ex (HS-Ex group, n=11). Ex groups underwent treadmill running for eight weeks.

Results: HS induced severe hypertension, and Ex did not significantly change systolic blood pressure (114±3, 111±3, 209±6 and 205±8 mmHg in the NS-Sed, NS-Ex, HS-Sed and HS-Ex groups, respectively). HS significantly increased plasma creatinine, and Ex did not affect plasma creatinine (0.22±0.01, 0.21±0.01, 0.44±0.03 and 0.40±0.03 mg/dl). HS decreased creatinine clearance, but Ex significantly increased creatinine clearance (2.57±0.07, 2.25±0.12, 0.96±0.04 and 1.35±0.18 mg/dl). HS induced massive proteinuria, but Ex significantly decreased urinary protein excretion (15.9±1.6, 14.8±1.9, 432.8±36.8 and 327.2±22.3 mg/day). Also, Ex improved HS-induced kidney weight gain and glomerulosclerosis. HS markedly increased urinary TBARS, an index of oxidative stress, but Ex significantly decreased urinary TBARS (0.30±0.02, 0.30±0.02, 0.75±0.06 and 0.53±0.03 μmol/day); there was no significant difference in plasma TBARS among all groups. Ex significantly decreased HS-stimulated xanthine oxidoreductase activity, but not NADPH oxidase activity in the kidney. HS significantly decreased NOS activity in all kidney sections, whereas it increased the eNOS protein expression in the renal cortex and outer medulla. Ex did not affect the HS-decreased NOS activity in the kidney, although attenuated the HS-increased eNOS protein expression.

Conclusions: This study demonstrated that Ex improves HS-induced renal dysfunction, proteinuria and glomerulosclerosis independently of blood pressure in Dahl -S rats. The renoprotective effects of Ex were concomitant with improvement of oxidative stress and NO system disorders in the kidneys. Ex may be an effective therapeutic approach for preventing the development of renal disorders in salt-sensitive hypertension.

PP.41.10 EXERCISE-INDUCED CARDIOPROTECTION AGAINST ISCHEMIA-REPERFUSION INJURY IS ABOLISHED AFTER DELTA OPIOID RECEPTOR BLOCKADE

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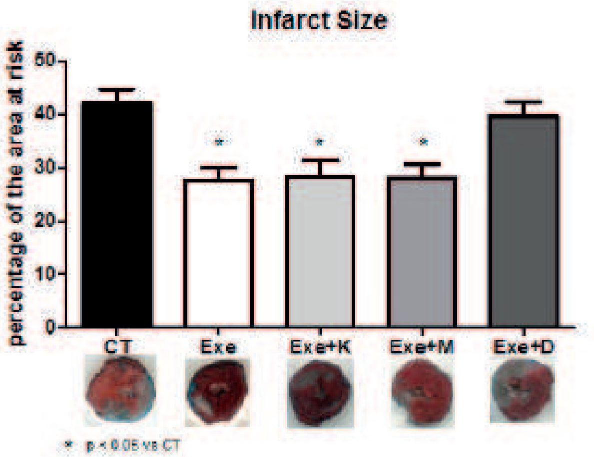
Objective: Investigate the mechanisms involved in exercise-induced cardioprotection.

Design and method: Male Wistar rats were first divided into 2 groups: exercised (Exe) and control (CT). The exercised group underwent 4 consecutive days of treadmill training (60 min at 70% of maximal oxygen consumption). To induce I-R injury, anesthetized animals were submitted to a left thoracotomy and a 30 min interventricular coronary occlusion followed by 60 min of reperfusion. The hemodynamic parameters were recorded and infarct size was determined post-mortem by double staining using TTC/Evans blue. Structural capillary density, gene expression of antioxidant enzyme capacity and opioid receptors subtypes expression were measured in left ventricle of Exe (n = 5) and CT (n = 5) groups using histochemical analysis, RT-PCR and western blotting; respectively. Exe group was then divided into 3 more subgroups: exercised + kappa opioid receptor antagonist (Exe + K; n=4); exercised + delta opioid receptor antagonist (Exe + D; n=4); and exercised + mu opioid receptor antagonist (Exe + M; n=4). All 3 groups were submitted to the same I-R injury, exercise and infarct size measurement protocol already described.

Results: The left ventricle structural capillary density was similar in both groups (Exe: 0.22 ± 0.01 vs CT: 0.21 ± 0.01 Vv[cap]/Vv[fib]). Measurement of mRNA expression of antioxidant enzymes in Exe and CT groups revealed no differences: endothelial cell superoxide dismutase (SOD) (1.1 ± 0.9 fold control), cupper zinc SOD (0.9 ± 0.2 fold control), manganese SOD (0.9 ± 0.2 fold control) and Catalase (1.1 ± 0.4 fold control). Exe group presented a significant reduced protein expression of KOR compared to CT group (0.46 ± 0.07 vs. 0.82 ± 0.08 a.u.; $p < 0.05$), whereas DOR was not different between groups (Exe: 0.38 ± 0.06 vs. CT: 0.61 ± 0.11 au). Finally, as shown in the figure, Exe group showed a significant reduction in the infarcted area (27.6%) when compared to CT group (42.0%). Exe+K and Exe+M did not alter the cardioprotective effect of exercise, whereas Exe+D abolished the exercise-induced cardioprotection.



Conclusions: Endogenous delta opioid system is involved in cardioprotection conferred by acute exercise.

PP.41.11 EFFECTS OF HIGH ALTITUDE EXPOSURE AND OF TREATMENT WITH TELMISARTAN AND NIFEDIPINE GITS COMBINATION ON BLOOD PRESSURE RESPONSE TO SIX MINUTE WALKING TEST IN HYPERTENSIVE SUBJECTS

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Objective: Acute exposure to high-altitude (HA) hypobaric hypoxia decreases exercise performance in healthy subjects, and increases systolic (S) and diastolic (D) blood pressure (BP). Little is known on BP responses to exercise in hypertensive subjects exposed to HA, and on effects of antihypertensive treatment in this setting.

Design and method: We aimed at evaluating the effects of telmisartan 80mg–nifedipine slow release 30mg (T/N) combination treatment in hypertensive subjects exposed acutely to HA who underwent 6-minute walk test (6MWT). Eighty-two mild-hypertensive participants of HIGHCARE-ANDES study (age 51.9±9.7; 47M/35F; BMI 28.2±3.5kg/m2) performed a 6-minute walk test(6MWT) in 3 conditions: at sea-level (SL) off-treatment (SLbas) and after 6 weeks of double-blind treatment with T/N (n=43) or placebo (PL, n=39) (SLtx); after the 1st full day of permanence at 3260m altitude (Huancayo-Perù; HA) under randomized treatment.

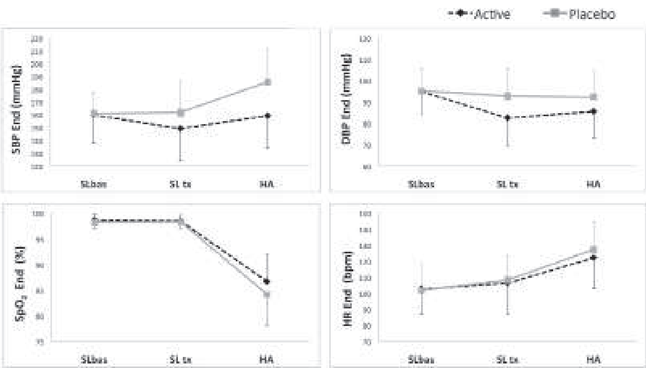

Figure. Clinical parameters after the six minute walking test (6MWT) at SLbas, SLtx and HA.SpO_2, Blood oxygen saturation; HR, Heart Rate; SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure; HA, high altitude; SL, sea level. Data are shown as mean±SD. + p <0,001 vs SL; ## p < 0, 001 vs PL; # p < 0, 01vs PL; ∫ p ≤ 0,05 vs PL.

Results: Exercise performance and vital signs after the exercise were similar in both groups at SLbas. SBP/DBP (Figure) at the end of the exercise was significantly lower in T/N than PL at SLtx (149.3±25.3/82.5±10.1 vs 162.1±24.6/92.9±13.1; p<0.001). At HA, SBP significantly increased in both groups after exercise, remaining significantly lower in T/N (159.1±24.6 vs. 185.7±25.6 mmHg, p<0.001). DBP did not differ between SLtx and HA in both groups, remaining lower in T/N (85.4±13.0 vs. 92.4±12.2, p<0.01). Mean end-exercise SpO2 decreased at HA in both groups, however, it was significantly higher in T/N compared to PL (86.6±5.2 vs 84.2±6.0; p<=0.05), whereas HR increased at HA, and did not show significant differences between groups. The 6-minute walking distance decreased significantly at HA, without differences between treatment groups, from 597±57 to 536.8±58.4m in T/N and from 599±61 to 537±56m in PL (both p<0.001).

Conclusions: Acute HA exposure is responsible for an increased SBP response at the end of exercise in hypertensive subjects as compared to sea level. At HA, T/N therapy effectively reduced SBP and improved oxygen saturation at the end of the exercise, without affecting the six minute walking test performance. These results are relevant for hypertensive subjects planning physical activity either for leisure or work at HA.

PP.41.12 EFFECTS OF ISOMETRIC AND AEROBIC EXERCISE ON PERIPHERAL AND CENTRAL BLOOD PRESSURE IN HYPERTENSIVE SUBJECTS

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Objective: Aerobic endurance and dynamic resistance exercise training are recommended by current hypertension guidelines as part of the non-pharmacologic treatment of hypertension. Isometric training, due to the lack of data from controlled trials is not been yet recommended for patients with hypertension, despite several trials suggesting a blood pressure lowering effect. We assess for the first time the effects of isometric handgrip training in a randomised controlled trial.

Design and method: 68 hypertensive patients were prospectively randomized in three groups to undergo following training modalities for 12 weeks: A. handgrip isometric training 5 times weekly consisting of 2 contractions of 2 min at 30% of maximal power with each arm corresponding to an overall duration of 12 min per training session; B. placebo-handgrip training 5 times weekly consisting of 2 contractions of 2 min at 5% of maximal power with each arm corresponding to an overall duration of 12 min per training session and C. aerobic exercise training of 30 minutes at least 3 times per week (no structured exercise regimen). All patients underwent office blood pressure measurement, 24h ambulatory BP measurement and non-invasive assessment of the arterial compliance by carotis-femoral pulse wave velocity at baseline and after 12 weeks.

Results: Baseline characteristics did not differ between groups (table 1). Patients in the aerobic exercise group showed a significant reduction of the office systolic BP from 141.0±19.9mmHg to 130.4±26.0 mmHg (p=0.018). In the 24h ABPM a significant reduction of the systolic and diastolic BP was seen (p=0.02 each). Patients undergoing aerobic exercise demonstrated an improvement of the augmentation index and the central blood pressure. Patients in the isometric groups did not show any changes in any of the endpoints of the study (table 2).

Table 1: Characteristics of the patients at baseline. Chi-Quadrat-Test und ANOVA test were performed.

	Totally (n=68)	Handgrip (n=23)	Placebo-Handgrip (n=23)	Aerobic Exercise (n=22)	p
Males	29	9	10	10	0.69
Females	39	14	13	12	
Mean age in years	61.4±9.4 (41-76)	60.4±10.1	61.8±7.3	62.3±10.7	0.42
Mean BMI in kg/m²	26.9±5.1	26.0±3.4	27.9±6.9	27.2±4.3	0.65
Atrial fibrillation, n	7	2	3	2	0.85
Coronary artery disease, n	2	0	2	0	0.15
Diabetes Mellitus	4	2	2	0	0.45
Hyperlipidaemia, n	30	9	12	9	0.52
Antihypertensive medication, n	52	21	16	15	0.51

Table 2: Results of the office blood pressure (BP), 24h-ambulatory blood pressure (ABPM) and carotid-femoral pulse wave velocity. Paired t-tests between baseline and follow-up were performed. P <0.05 was regarded significant.

	Handgrip (n=23)			Placebo-Handgrip (n=23)			Aerobic Exercise (n=22)		
	Baseline	Follow-up	p	Baseline	Follow-up	p	Baseline	Follow-up	p
Office syst. BP (mmHg)	137.5±21.0	137.3±14.5	0.92	137.3±21.7	132.2±15.7	0.22	141.0±19.9	130.4±26.0	**0.018**
Office diast. BP (mmHg)	79.0±11.6	78.1±8.9	0.54	76.7±11.9	77.0±10.5	0.93	74.8±11.4	72.1±16.9	0.35
24h-ABPM syst. (mmHg)	123.5±10.2	125.2±9.7	0.4	128.5±16.6	126.0±11.4	0.25	128.9±10.7	123.2±11.9	**0.02**
24h-ABPM diast. (mmHg)	77.1±8.2	76.6±5.9	0.72	81.0±9.4	79.5±6.9	0.29	79.3±9.1	76.7±11.2	**0.02**
24h-ABPM daytime syst. (mmHg)	128.0±10.9	129.5±9.3	0.44	133.3±16.4	130.0±10.9	0.19	133.8±11.1	126.9±11.5	**0.007**
24h-ABPM daytime diast. (mmHg)	80.8±8.7	80.2±6.1	0.65	85.5±10.4	82.9±7.7	0.13	83.1±9.4	79.6±11.9	**0.005**
24h-ABPM nighttime syst. (mmHg)	115.6±9.5	117.3±11.2	0.39	119.5±18.5	119.1±14.0	0.67	120.5±11.9	115.3±13.8	0.06
24h-ABPM nighttime diast. (mmHg)	70.5±8.2	70.5±8.9	0.95	73.4±9.4	73.1±7.4	0.77	72.8±9.5	70.8±10.4	0.19
Carotid to femoral pulse wave velocity (m/s)	9.2±2.2	9.5±2.7	0.56	8.5±1.9	8.7±2.4	0.51	8.8±2.4	9.4±3.1	0.28
Augmentation Index (%)	23.7±12.3	21.0±9.7	0.15	22.8±10.7	20.1±8.9	0.12	22.8±10.1	16.1±10.3	0.014
Central systolic BP (mmHg)	140.0±22.1	134.6±16.1	0.1	139.8±23.1	132.0±16.6	0.08	145.7±15.6	134.6±19.7	0.012

Conclusions: Isometric handgrip training, performed according to a typical protocol, does not reduce blood pressure in hypertensive patients. Aerobic exercise, even as an uncontrolled and unsupervised exercise regimen, led to a significant reduction of the peripheral and central blood pressure.

PP.41.13 MEAN ARTERIAL PRESSURE DURING SUBMAXIMAL EXERCISE IS ASSOCIATED WITH MAKERS OF SUBCLINICAL ATHEROSCLEROSIS IN PREHYPERTENSION

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Objective: Recent studies have suggested that pathophysiological alterations of vascular wall may contribute to an excessive increase in BP during dynamic exercise. The aim of this study was to examine the possible association between mean arterial pressure (MAP) during submaximal exercise and the markers of subclinical atherosclerosis in prehypertensive subjects.

Design and method: The study population consisted of 109 untreated men (mean age, 44 years) with prehypertension (SBP, 120-139mmHg; DBP, 80-89mmHg). A graded exercise test was performed on a bicycle ergometer and MAP ({SBP-DBP}/3+DBP) during a submaximal workload of 100 watts was evaluated. Arterial stiffness was assessed by an augmentation index (AIx) on the basis of radial pressure waveform analysis. Albumin-to-creatinine ratio values were determined as the mean of two nonconsecutive spot urine specimens. A fasting blood sample was collected for the measurement of lipid and glucose profiles by standard techniques.

Results: The mean±SD of MAP during the submaximal exercise was 123±15 mmHg. The MAP values were expressed as z-score normalized for the relative increase in HR from baseline to exercise. The MAP z-score was significantly higher in the subjects with elevated BP, dyslipidemia, or hyperglycemia than in those without such metabolic risk variables. The subjects with higher exercise MAP z-score (>=+1.0, n=38), compared with those with the lower MAP values (<+1.0, n=71), exhibited significantly higher AIx (77.1±13.1 vs. 63.2±15.8 %, p<0.01) and greater log albumin-to-creatinine ratio (0.82±0.32 vs. 0.52±0.29 mg/gCre, p<0.01), independent of potentially confounding factors. Multivariate regression analysis revealed that resting elevated SBP (β=0.277) and DBP (β=0.306) and greater albumin-to-creatinine ratio (β=0.247) were independent determinants of increased MAP z-score during submaximal exercise (R^2=0.401, F=25.6; p<0.001).

Conclusions: These results suggest that a subclinical atherosclerosis may have a greater influence on vascular reactivity than on basal tone and hence could potentially be identified by an exaggerated response of BP to dynamic exercise even before clinical manifestation of hypertension.

PP.41.14 THE CARDIOVASCULAR PARAMETERS VARIATION DURING SUBMAXIMAL EFFORT PERFORMED BY SUPRAPONDERAL STUDENTS

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Objective: To investigate cardiovascular adaptation to submaximal effort performed by untrained supraponderal students.

Design and method: There were enrolled in the study 10 male students (20 years old), with body weight 78.8 ± 14.14 Kg, 176 ± 6.84 cm high, untrained, nonsmokers. The BMI was 25 to 29.9. The students performed a progressive submaximal effort on the cycloergometer until reaching the optimal heart rate (OHR = 175 b/min). The charge increased every two minutes with 25 W. There were determined the blood pressure (BP), heart rate (HR) before, during the exercise and at the end of the effort.

Results: Resting heart rate (HR) was 85.6 ± 13.69 b/min slightly increased caused by the sympathetic activation, reached HR of 161.33 ± 9.79 b/min in the 12 min of the effort. After 2 minutes at the end of the effort HR was still high (127 ± 6.22 b/min).
During the effort, systolic blood pressure gradually increased with 2.8 mmHg/min (158±11.66 mmHg vs. 124 ± 7.34 mmHg). The diastolic blood pressure at rest was 72 ± 8.12 mmHg and slightly decreased at the end of effort (70 ± 8.36 mmHg). This can be explained by the decrease of the total peripheral resistance due to vasodilatation. 2 minutes after the effort ended, systolic blood pressure decreased to 138 ± 7.48 mmHg, and diastolic blood pressure was 66 ± 5.83 mmHg. There was a positive correlation between body weight, heart rate (r = 0.68), and blood pressure (r = 0.73), during the submaximal effort.
The effort test was stopped in some cases after 10 minutes when the HR was 159±14.83 b/min because the students presented dispnea. The students were advised to reduce their body weight in order to decrease the cardiovascular risk associated with to being overweight.

Conclusions: Cardiovascular response to effort was in normal limits. The effort test demonstrated that the students can perform an effort test even if they are overweight and OHR wasn't reached in all cases.

PP.41.15 RESPONSE OF CENTRAL BLOOD PRESSURE TO ISOMETRIC AND ISOTONIC EXERCISES IN MILD HYPERTENSIVE PATIENTS

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Objective: Blood pressure measured over the brachial artery (peripheral blood pressure) is routinely used for individual risk evaluation and management of hypertension, because it has been established as a powerful predictor of cardiovascular morbidity and mortality. However, blood pressure changes every moment and peripheral blood pressure measured during exercise has been recognized as a marker of cardiovascular risk independent of resting peripheral blood pressure. Recent studies suggest that central blood pressure is more closely associated with target organ damage and cardiovascular events than peripheral blood pressure. The aim of the present study was to investigate central blood pressure responses to exercise.

Design and method: Subjects with mild hypertension who attained target blood pressure (140/90 mmHg) following lifestyle modification without any antihypertensive medication were enrolled in the study (38 ± 6 years, n = 18) and changes in central and brachial blood pressure were recorded in response to ergometer and hand-grip exercises. Central blood pressure was estimated using an automated device (Omron HEM-9000AI).

Results: Systolic brachial blood pressure was increased after both ergometer (from 119 ± 10 to 172 ± 16 mmHg; p < 0.001) and hand-grip (from 118 ± 8 to 122 ± 9 mmHg; p < 0.05) exercises, but central systolic blood pressure was increased only after hand-grip exercise (from 117 ± 11 to 121 ± 12 mmHg; p < 0.05). The radial augmentation index was increased after hand-grip exercise, whereas ergometer exercise reduced this index. Heart rate was increased only after ergometer exercise.

Conclusions: Isometric, but not isotonic, exercise increases central blood pressure in subjects with mild hypertension. The response of central blood pressure, which is a better index of cardiac load than peripheral blood pressure, to hand-grip exercise may be useful in evaluating cardiovascular risk.

PP.41.16 ALTERED LEUKOCYTE MICRORNA-21 AND -210 ABUNDANCE AFTER 4 WEEKS OF HIGH-INTENSITY EXERCISE TRAINING

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Objective: Small RNA molecules called microRNAs (miRNAs) circulate in human blood and control protein level by post-transcriptional regulation, and as a result govern most cellular functions. Aberrant miRNA expression has been associated with age-related cardiopulmonary/metabolic diseases. Many miRNAs are aberrantly expressed in blood and serve as biomarkers of disease. In particular, miR-21 and miR-210 are related to cardiovascular disease and cancer. Interestingly, the expression of miR-21 and miR-210 has been correlated with cardiorespiratory fitness (VO2max) in healthy individuals, but whether these miRNAs are modulated by long-term exercise training is still unknown. The aim of our study was to determine whether miR-21 and miR-210 are altered by long-term high-intensity interval training (HIT).

Design and method: 19 young (18-24yrs) men completed a physical assessment, treadmill VO2max test and a 5km time-trial before and after 4 weeks of three times a week sprint interval training (HIT). Leukocyte RNA was extracted from blood collected at rest and after a VO2max test before and after HIT. miR-21 and miR-210 expression were quantified by TaqMan quantitative polymerase chain reaction (qPCR) assays.

Results: HIT increased VO2max (ml.kg.min-1, 4.7%, P < 0.05) and maximal treadmill speed (Vmax, 4%, P < 0.01), and decreased low-density lipo-protein (LDL) cholesterol (-3.9%, P < 0.05) and 5km time-trial (-6.2%, P < 0.001). Basal miR-21 expression was higher after 4 weeks of HIT (0.89 ± 1.0 to 1.68 ± 0.92, P < 0.05), and miR-210 expression was lower (0.87 ± 0.48 to 0.51 ± 0.24, P < 0.01). Additionally, miR-210 expression was lower after acute maximal exercise (VO2max test), before (0.87 ± 0.48 to 0.52 ± 0.21, P < 0.01) and after (0.51 ± 0.24 to 0.34 ± 0.1, P < 0.01) HIT.

Conclusions: MiR-210 is lower after acute maximal exercise and both miR-21 and -210 are modulated by HIT. These exercise-responsive miRNAs may contribute to the beneficial cardiorespiratory and cardiovascular health and performance adaptations caused by HIT by regulating key genes.

PP.41.17 IMPAIRED NITRIC OXIDE METABOLISM IS ASSOCIATED WITH HYPERTENSIVE RESPONSE TO EXERCISE

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Objective: To evaluate if there is an association between increase in systolic blood pressure (SBP) during exercise test and baseline values of circulating blood markers of endothelial function: the stable end product of nitric oxide (NOx), asymmetric dimethylarginine (ADMA) and symmetric dimethylarginine (SDMA)(endogenous compounds which impair NO synthesis), and xanthine oxidase (XO, an oxidant-producing enzyme), in hypertensive patients with coronary artery disease (pts).

Design and method: 40 hypertensive male pts were enrolled in the study>3 months after myocardial infarction. In all pts submaximal or symptom limited bicycle exercise test was performed. Patients were classified according to the percent increase in SBP before and after exercise test: increase in SBP less than 15,4% (Group I, N=20 pts, mean age 55 years), and increase in SBP greater than 15,5% (Group II, N=20 pts, mean age 54 years) on the same level of test. Venous blood samples were taken before exercise test and values of NOx, ADMA, SDMA and XO were determined.

Results: Level of exercise achieved was 5.2 MET in both groups. Concentration of NOx was higher in Group I than in group II (37.6±8.4 vs 33.7±7.3 µmol/l, ns), while concentrations of ADMA and of SDMA were significantly lower in Group I than Group II: ADMA 0.257±0.049 µmol/l vs 0.294±0.061 µmol/l; P=0.042; SDMA 0.223±0.035 vs 0.255±0.044 µmol/l; P=0.018. XO activity was also significantly higher in Group II than in Group I (344,5±20.5 vs 303.8±10.9 µmol/l.;

P<0.0005). A positive correlation was also found between increase in SBP per minute and XO (r=0.353; P=0.027) and between difference in baseline SBP and SBP at the and of test and XO (r=0.402;P=0.025) in both groups.

Conclusions: Our results show an association between increase in SBP during exercise test and metabolic markers of endothelial function, for the same level of exercise in hypertensive patients with coronary artery disease. Higher values of ADMA, SDMA, and XO, may induce unfavorable changes in vascular tone, and hence they might contribute to impair endothelial function and SBP regulation during exercise.

PP.41.18 IMPACT OF ACUTE EXERCISE ON MICROVASCULAR REACTIVITY IN HEALTHY SEDENTARY SUBJECTS AND TRAINED ROWERS: POSSIBLE ROLE OF BLOOD PRESSURE INCREASE DURING EXERCISE

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Objective: While it is well recognized that chronic exercise protects against the development of hypertension, acute exhausting exercise (AE) can induce large, transient increases in arterial blood pressure (ABP) and metabolic acidosis, which can be associated with pro-inflammatory response involving oxidant stress known to impair endothelial function.The aim of this study was to test the impact of acute exhausting rowing training on microvascular reactivity in sedentary subjects and trained rowers.

Design and method: Healthy lean sedentary subjects (Sedentary) (N=8) and trained rowers (Trained) (N=8) underwent a single progressive rowing training to maximal exhaustion. Skin microvascular post occlusive reactive hyperemia (PORH) (indicator of endothelial function) was assessed by laser Doppler flowmetry (LDF) before and after AE. ABP, heart rate and oxygen saturation were measured before and after AE and between workloads. Body mass index (BMI) and waist to hip ratio (WHR) were measured in each subject. Plasma glucose, C reactive protein (CRP) and lactate levels, as well as, arterial blood gas analysis and acid base status were measured before and after AE.

Results: All subjects were normotensive age-matched males, with no difference in BMI, WHR, control ABP and heart rate between groups. At baseline, Trained had significantly higher PORH compared to Sedentary (P=0.003). While AE didn't induce any significant change in PORH in Sedentary (P=0.471), PORH was significantly impaired in Trained after AE (P=0.016). Serum lactate and glucose levels significantly increased, and metabolic acidosis occurred, while oxygen saturation decreased after AE in both groups. CRP significantly increased in Sedentary after AE. Systolic blood pressure (SBP) significantly increased during AE in both groups, but more prominent in Trained compared to Sedentary. Increment of SBP during AE tended to adversely correlate with PORH (P=0.068).

Conclusions: These data suggest that a single progressive rowing training to maximal exhaustion impaired microvascular reactivity in trained rowers but not in sedentary subjects, possibly due to 1) higher transient increase in arterial pressure that occurred in trained rowers and/or 2) change in sensitivity to metabolic acidosis during exertion in athletes.

PP.41.19 PHYSICAL PRE-CONDITIONING ATTENUATES DEXAMETHASONE-INDUCED HYPERTENSION INDEPENDENTLY OF RENIN-ANGIOTENSIN SYSTEM

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Objective: To verify the role of renin-angiotensin system (RAS) on dexamethasone-induced hypertension and if this system was involved in the attenuation of blood pressure induced by aerobic exercise.

Design and method: Sixty-seven Wistar rats (±250g) were separated into eight groups: sedentary control (SC), sedentary dexamethasone (SD), trained control (TC), trained dexamethasone (TD), sedentary losartan (SL), sedentary dexamethasone+losartan (SDL), trained+losartan (TL) and trained dexamethasone+losartan (TDL). Animals underwent a training protocol (treadmill, 50-60% of the physical capacity, 1h, 5 days/week for 70 days) or were kept sedentary. During the last 10 days, treated rats received Dexamethasone (Dexa, 1mg/kg per day, i.p) and/or losartan (50mg/Kg per day, oral). All control animals were treated with vehicle. Blood pressure (BP) was assessed after 10 days of treatment. After the experimental protocol, the Left Ventricle (LV) was removed, cleaned, weighed and used for determination of gene expression and protein levels of renin, angiotensinogen (AGT), angiotensin II receptor AT1 and angiotensin II receptor AT2. All data are reported as mean±SEM (p<0.05).

Results: Systolic BP increased 16% (131±4 vs 113±3 mmHg, for SD vs SC, respectively) and mean BP increased 8%. On other hand, training decreased in 7% systolic BP (131±4 vs 122 ± 2 mmHg, for SD vs TD, respectively). Treatment with losartan did not attenuate the increase in BP induced by Dexa (128±5 mmHg). In order to verify the role of RAS, the gene expression and protein levels of its components were assessed by real-Time PCR and Western Blotting analysis, respectively. Dexa Treatment did not determine any alteration of AGT, AT1 or AT2 receptors mRNA. AT1 receptor mRNA was 88.5% higher in TC group compared to SC, but when the animals were treated with Dexa, these values decreased 49.5% (TD vs TC). Dexa only decreased 31% the AGT protein levels and no other changes were observed in any group, even after training.

Conclusions: The results of gene expression and protein levels, associated with BP after losartan treatment, suggest that in this protocol probably the RAS is not the major contributor for the dexamethasone-induced hypertension. Financial support: FAPESP, CNPq and CAPES.

PP.41.20 PHYSICAL FITNESS IMPROVEMENT AFTER CARDIAC REHABILITATION PROGRAM DEPENDS ON PWV

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Objective: Aortic pulse wave velocity (PWV) is a measure of vascular organ damage. After a cardiac event, patients can be offered to follow an educational and exercise program to prevent future events and improve their cardiovascular risk. We hypothesized that the improvement of aerobic performance, measured by maximal oxygen uptake (VO2max), will depend on their initial arterial health measured by PWV.

Design and method: 126 patients (99men, 27women) followed cardiac rehabilitation (CR) programs of Bellan Hospital in Paris. CR duration lasted from 1 to 4 months. 112 patients with both PWV and VO2max measurements before and after CR were analysed. Carotid-femoral PWV and mean arterial pressure (MAP) were measured in a quiet room in the morning of their first and last day prior to any exercise.

Results: After CR, patients improved VO2max (19.6±5.5 to 22.0±6.4 ml/kg/min, +12%, p<0.01) and MAP (92.1±11.8 to 87.9±9.9 mmHg p<0.01), but not PWV (12.0±3.5 to 11.3±3.1 m/s, p=0.1). PWV was negatively correlated with VO2max both before and after CR (p<0.0001 for both). When the cohort was separated into PWV tertiles at entry, patients with the lowest PWV exhibit the highest improvements in VO2max (15.4%, p<0.001), and the lowest improvement of PWV (8.8±0.9 to 9.2±1.9 m/s, p=0.4) and MAP, while patients in the highest tertile improved PWV (15.8±3.1 vs 14.0±3.2 m/s, p=0.001) and MAP, but with lesser improvement of VO2max (5.8%, p=0.005) (see figure).

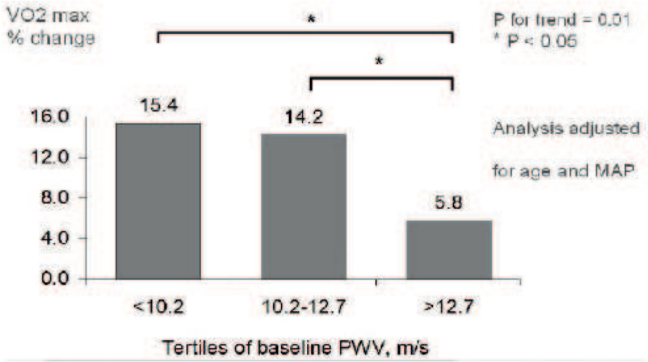

Figure. Percent of changement of maximal oxygen uptake (VO2max) after rehabilitation program by tertiles of baseline aortic pulse wave velocity (PWV). MAP: mean arterial pressure.

Conclusions: In our cohort, physical fitness improvement depends on basal arterial stiffness with highest results for patients with low PWV and poorest results for patients with high PWV.

POSTERS' SESSION

POSTERS' SESSION PS42

DIABETES - KIDNEY - PERIPHERAL ARTERIOPATHY

PP.42.01 HEART RATE VARIABILITY CAN BE ALTERED TO INDICATE CARDIAC MORTALITY AS A FUNCTION OF RENAL DYSFUNCTION FROM AN EARLY- TO END-STAGE OF CHRONIC KIDNEY DISEASE

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Objective: Heart rate variability (HRV) can represent one of the most promising markers for autonomic activity relating to cardiovascular mortality. Decreases in both traditional (i.e., SDNN, RMSSD, VLF, LF/HF), and novel indices [i.e., fractal scaling exponents α1, and deceleration capacity (DC5)], can be provided as the risk for mortality in various clinical settings. Recently, we have reported that an increase in Non-Gaussianity index (λ25) is associated exclusively with increased cardiac mortality risk among post-AMI patients. Meanwhile, autonomic dysfunction can be injured in patients with chronic kidney disease (CKD) even in the early stage. We examined whether heart rate variability can be altered to indicate cardiac mortality as a function of renal dysfunction.

Design and method: Cross sectional study in forty-seven patients with CKD [23 male and 24 female; 49, 36-65, years (median, IQR); eGFR, 63, 39-91, ml/min/1.73m2]. HRVs, including SDNN, RMSSD, VLF, LF/HF, α1, DC5 and λ25, were evaluated by 24-h holter ECG recording.

Results: Median and IQR of the HRVs were SDNN (125, 103-153), RMSSD (26, 18-40), VLF (7.3, 6.6-7.7), LF/HF (2.07, 1.36-2.47), α1 (1.16, 1.04-1.28), DC5 (6.9, 5.0-8.3), and λ25 (0.48, 0.40-0.56), respectively. GFR exhibited positive relationships with SDNN (r=0.16, p=0.3), RMSSD (r=0.01, p=0.9), VLF (r=0.30, p=0.04), LF/HF (r=0.24, p=0.1), α1 (r=0.36, p=0.01) and DC5 (r=0.30, p=0.04), and inversely correlated with λ25 (r=-0.46, p=0.001). When analyzed by stepwise multiple regression analysis (R2 = 0.44), reduced eGFR showed significant relationship with increased λ25 (r=-0.32, F=8.4) and older age, rather than other HRVs.

Conclusions: As renal function deteriorated, SDNN, RMSSD, VLF, LF/HF, α1, DC5 were all decreased, and λ25 increased, indicating an elevated risk of cardiac mortality. Further studies are needed to explore the reason why λ25, out of the HRVs, was most closely related to the renal function, and whether theλ25 can be used as the predictor of the cardiac death in CKD patients.

PP.42.02 SERUM CYSTATIN C IS A DETERMINANT OF CENTRAL PRESSURE AUGMENTATION MEASURED BY OSCILLOMETRIC METHOD IN RENAL TRANSPLANT RECIPIENTS

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Objective: Cardiovascular diseases are particularly prevalent in renal transplant recipients (RTR). Besides traditional risk factors such as dyslipidemia, diabetes or hypertension, others factors more specific to RTR are thought to be in play and to explain the excess of risk seen in transplantation. Beyond its role in evaluating renal function, ScysC is more and more regarded as a potential cardiovascular risk factor. Interestingly, the ability of ScysC to predict cardiovascular outcome is thought to be explained not only by the ability of ScysC to detect renal function impairment but also by its possible connection to others factors that are directly related to cardiovascular diseases.

We aimed to better understand the cardiovascular dimension of ScysC in renal transplantation. We sought to verify whether the association between ScysC and arterial stiffness seen in the general population could extend to RTR and explored the confounding role of major traditional and non-traditional transplant-related cardiovascular risk factors.

Design and method: We explored the potential association of ScysC with arterial stiffness - a major contributor to cardiovascular disease - in RTR. Traditional and non-traditional cardio-vascular risk factors were collected from 215 stable RTR whom arterial stiffness was evaluated by the measure of the augmentation index of central pressure (AIx) determined by the arteriograph device. Serum creatinine and ScysC were measured the same day using standardized methods. Association between ScysC and Aix was examined in univariate and multivariate linear regression analysis.

Results: Two hundred and fifteen RTR were retained for the analysis. ScysC was positively associated with AIx following a monotonic increasing curve. The relation between serum creatinine and AIx followed a J-shaped curve. In univariate analysis, ScysC was strongly associated with AIx. This relationship was not confounded by age, gender, length of time spent on dialysis and transplantation vintage. Adjustment on the level of GFR estimated by the MDRD Study equation attenuated but did not abolish the association between ScysC and AIx.

Conclusions: ScysC is an independent predictor of AIx in RTR. Our data suggest that arterial stiffness may partially mediate the association between ScysC and cardiovascular risk in renal transplantation.

PP.42.03 FEATURES OF THE COURSE OF HYPERTENSION AFTER LAPAROSCOPIC NEPHRECTOMY FOR KIDNEY TUMOR

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Objective: Objective of the study is to analyze the dynamics of blood pressure in the early postoperative period in patients with a tumor of the kidney and hypertension after laparoscopic nephrectomy.

Design and method: Group for laparoscopic nephrectomy selected 53 patients with hypertension aged 37-65 years (average age of 49±7 years). Duration hypertension patients with kidney tumors was 6.5±3.2 years. All patients to assess the effectiveness of the primary purpose or need antihypertensive therapy before the surgery was conducted ambulatory blood pressure monitoring, and with the purpose of correction of antihypertensive therapy after surgery blood pressure monitoring performed on the second and tenth day using the monitor ÌECG-DS-HC-01 («LCA Advanced technologies», Russia).

Results: Strengthening of antihypertensive therapy took all the patients on the second day after the operation, on the tenth day correction of antihypertensive therapy was needed 32 patients (60,4%). Preference given angiotensin inhibitors fosinopril since fosinopril hydrolytic conversion by enzymes in fozinoprilat predominantly occurs in the liver and the mucosa of the gastrointestinal tract. The drug is excreted equally by the liver and kidneys. Dose was selected individually and is 10 to 40 mg per day. After laparoscopic nephrectomy on the second post-operative day were elevated following indicators: daily average systolic blood pressure (167,2±17,8) daily average diastolic blood pressure (96,7±6,2), daily average systolic blood pressure (167,1±18,2), average nighttime systolic blood pressure (154,0±19,7), time index (46,9±14,1%).
After correction of antihypertensive therapy and added to the treatment regimen of nifedipine retard, a decrease of some indicators of ambulatory blood pressure monitoring on the tenth postoperative day, but many of them remained elevated according to the regulations daily average systolic blood pressure (137,2 ±6,8), daily average systolic blood pressure (145,9 ±3,9), average nighttime systolic blood pressure (132,4 ±3,9). Further reception of antihypertensive drugs after surgery allowed to achieve the target values of blood pressure.

Conclusions: Patients with a tumor laparoscopic nephrectomy lead to postoperative increase blood pressure on the second day in 100% of cases, due to the peculiarities of surgical intervention, increased intra-abdominal pressure, hypercapnia. Therapy with calcium antagonists allows to achieve target blood pressure levels.

PP.42.04 HIGH ANKLE BRACHIAL INDEX IS ASSOCIATED WITH VASCULAR CALCIFICATION IN CHRONIC KIDNEY DISEASE

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Objective: The ankle brachial index (ABI) is a noninvasive measure of subclinical CVD and atherosclerosis of the lower extremities. Recently, data suggested that high ABI was associated with cardiovascular mortality and vascular calcification in dialysis patients. However, the association of the spectrum of vascular calcification and high ABI is not well studied in pre-dialysis patients. We investigated the association of vascular calcification with risk of high ABI (>1.4) in 243 patients with chronic kidney disease (CKD).

Design and method: CKD was defined as estimated glomerular filtration rate (eGFR) <60mL/min/1.73m2 or presence of albuminuria. Vascular calcification was assessed using electron-beam computed tomography (EBCT) and coronary artery calcification (CAC) Agatston score was calculated. CAC was classified as none (0), moderate (>0-100) or severe (>100) according to Agatston scores. ABI was obtained per standard protocol and high ABI was defined as >=1.4. Multivariable logistic regression was used to explore the association of CAC and high ABI adjusted for age, gender, race, cigarette smoking, alcohol drinking, body mass index (BMI), LDL-cholesterol, physical activity, mean arterial pressure (MAP), glucose, history of CVD, eGFR, urine albumin/creatinine ratio, treatment for hypertension, diabetes, and hyperlipidemia, and aspirin use.

Results: Compared to those without CAC, the patients with moderate and severe CAC had increased risk of having high ABI. For example, the odds ratio (95% confidence interval) associated with moderate and severe CAC was 7.5 (1.0, 58.3) and 18.3 (2.6, 128.4) for ABI>= 1.4, respectively, after adjustment for age, gender, race, high-school education, physical activity, current cigarette smoking, weekly alcohol drinking, body mass index, LDL-cholesterol, plasma glucose, mean arterial pressure, estimated glomerular filtration rate, and history of cardiovascular disease.

Conclusions: These data indicate that vascular calcification may be associated with risk of high ABI in patients with CKD independent of risk factors for arthrosclerosis.

PP.42.05 ARTERIAL STIFFNESS IS ASSOCIATED WITH VASCULAR CALCIFICATION IN CHRONIC KIDNEY DISEASE

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Objective: Arterial stiffness is very common and associated with increased risk of cardiovascular disease (CVD) in patients with chronic kidney disease. The underlying etiology for increased arterial stiffness is not fully understood. We investigated the association of vascular calcification with risk of arterial stiffness in 235 patients with chronic kidney disease (CKD).

Design and method: Arterial stiffness was measured by aortic pulse wave velocity (PWV) and defined as PWV greater or equal to 10 m/s. Vascular calcification was assessed using electron-beam computed tomography (EBCT) and coronary artery calcification (CAC) Agatston score was calculated.Multivariable linear regression was used to examine the association between PWV and CAC. PWV and CAC were log-transformed.

Results: The prevalence of arterial stiffness was 37% in this study population. In the linear regression model, log-transformed coronary arterial calcification (CAC) was significantly and positively associated with log-transformed pulse wave velocity. For example, one standard deviation higher log-transformed CAC Agatston score (2.8) was associated with a 0.03 m/s (95% confidence interval: 0.02, 0.05, p<0.0001) higher log-transformed pulse wave velocity after adjustment for age, gender, race, high-school education, physical activity, current cigarette smoking, weekly alcohol drinking, body mass index, LDL-cholesterol, plasma glucose, mean arterial pressure, estimated glomerular filtration rate (eGFR), and history of cardiovascular disease.

Conclusions: These data indicate that vascular calcification may be associated with increased arterial stiffness in patients with CKD independent of risk factors for arthrosclerosis.

PP.42.06 PHENOTYPIC EXPRESSION OF ESSENTIAL HYPERTENSION AND INTRARENAL RESISTANCE

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Objective: Renal resistive index (RI) reflects not only intrarenal, but also systemic haemodynamic conditions. The present study sought to determine the relationship between RI and the type of hypertension in patients with essential hypertension.

Design and method: A total of 275 consecutive, newly diagnosed, never treated, essential hypertensive patients grade 1-3, (mean age 51±14 year, 55% male), referred to the outpatient antihypertensive unit of our institution were studied. Diabetic individuals and those with overt cardiovascular or renal disease were excluded. The evaluation of target organ damages (OD) was performed in accordance to the European Society of Hypertension guidelines. Moreover, all patients underwent renal Doppler ultrasound with RI measurement. The mean value of RI from both kidneys was used for the analysis. Based on office and ambulatory blood pressure (BP) levels, the population was split in four groups: masked (17%), isolated systolic (ISH, 15%), isolated diastolic (IDH, 13%) and mixed (systolic-diastolic, SDH, 55%) hypertension.

Results: Patients with ISH were older, predominantly male, with more severe OD, less fit and with the highest RI (Table). Patients with IDH were younger, predominantly female with excellent OD profile, physically active and with the lowest RI. Between these two extreme clinical profiles were patients with masked and SDH, who were middle-aged with intermediate OD profile, moderately active and intermediate RIs. Multinomial logistic regression analysis (reference category IDH) revealed that RI (ISH vs. IDH: OR 1.24 with 95% CI 1.08-1.40 - p=0.001, Masked vs. IDH: OR 1.13 with 95% CI 1.03-1.25 - p=0.008, SDH vs. IDH: OR 0.94 with 95%CI 0.84-1.04 - p=0.263), pulse pressure and heart rate were independent determinants of hypertension type after adjustment for age, gender, abdominal obesity and glomerular filtration rate.

	Masked	ISH	IDH	SDH	p-value
Age, years	53±17	59±14	44±12	49±12	<0.001
Gender, % male	42	64	37	61	0.006
Abdominal obesity, %	35	51	22	50	0.008
Office systolic blood pressure, mmHg	131±7	147±8	135±4	158±16	<0.001
Office diastolic blood pressure, mmHg	80±7	82±7	95±4	111±9	<0.001
Office heart rate, beats per minute	70±19	72±13	84±12	81±12	<0.001
24-hour systolic blood pressure, mmHg	121±7	126±9	122±11	129±12	<0.001
24-hour diastolic blood pressure, mmHg	70±8	69±9	78±8	79±8	<0.001
24-hour heart rate, beats per minute	69±8	69±9	79±9	74±8	<0.001
Albumin-to-creatinine ratio, mg/g	9 (6-13)	10 (6.5-20)	7 (5-13)	9 (6-16)	0.220
Glomerular filtration rate, ml/min	104±40	97±43	115±30	116±37	0.027
Plasma creatinine, mg/dl	0.85±0.18	0.84±0.17	0.87±0.14	0.90±0.19	0.250
Carotid femoral pulse wave velocity, m/sec	7.8±2	8.8±2	8.0±1.6	8.6±2	0.012
Left ventricular mass index, kg/m²	79.9±15.8	82.8±18	83.8±19.3	88.9±19.8	0.015
Tissue Doppler imaging mean annular Em/Am	0.97 (0.8-1.3)	0.86 (0.7-1.1)	0.96 (0.7-1.3)	0.89 (0.7-1.1)	0.012
Mean common carotid intima-media thickness, mm	0.69 (0.60-0.82)	0.72 (0.63-0.83)	0.56 (0.53-0.67)	0.63 (0.56-0.74)	<0.001
Treadmill stress test, metabolic equivalents	11±2.6	9±3.5	12±1.8	11±2.3	0.004
Renal resistive index	0.64±0.06	0.67±0.06	0.58±0.05	0.60±0.06	<0.001

Conclusions: Renal resistive index is closely associated both with systolic and diastolic BP and is an independent determinant of hypertension phenotype.

PP.42.07 INTRADIALYTIC HYPERTENSION IN HEMODIALYSIS PATIENTS TREATED WITH ERYTHROPOETIN

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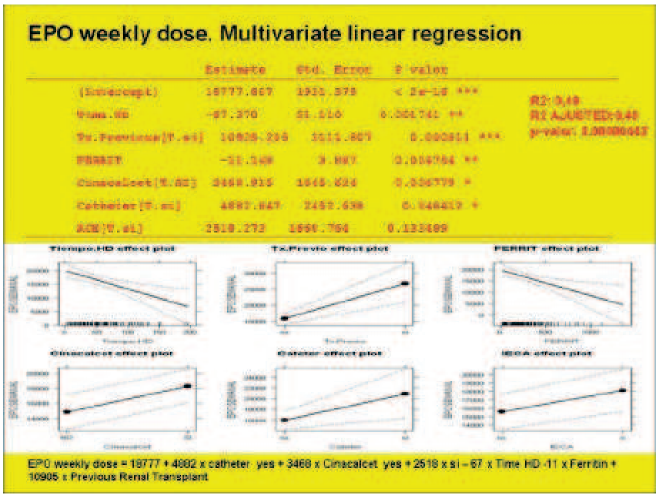
Objective: Intradialytic hypertension not diminish with Ultrafiltration. Treatment of anemia with Erythropoetin is associated with increased peripheral vascular resistance increased hematocrit, increased plasma levels of endothelin and decreased nitric oxide synthesis, stocks that worsen hypertension control.

Design and method: We studied 187 patients with CRF-V in hemodialysis with a pattern of 4 hours / session / 3 sessions a week. Analyzed: age, sex, months

on hemodialysis, PTH, albumin, ferritin, Baking, weekly Erythropoetin dose / weight, and type of EPO, Hct, Hgb, Ab treatment. Folic Cinacalcet, paricalcitol, statins, type of heparin, if they had central venous catheter for vascular access, Kt / V, type and number of antihypertensive drugs, previous renal transplantation. Weekly doses of EPO and intradialytic hypertension as dependent variables. We used for statistics SPSS 15 and R-RComander. Univariate analysis was first performed by Chi2 test with risk analysis, mean comparison and multivariate binary logistic regression and multiple linear regression.

Results: Patients with doses> 450 U / kg / week were younger and took as many hypotensive treatment. In the comparison of proportions, we found that the group with the highest dose of Epo had intradialytic hypertension, had a previous kidney transplant, and were being treated with ACE inhibitors. The variables that explain the weekly dose of EPO after multivariate linear regression are positively correlated: Having placed a central venous catheter over supposed Epo 5000 U / week, previous renal transplantation involves 11,000 units of EPO weekly treatment with Cinacalcet 4800 . Inverse relationship with the weekly dose of EPO in hemodialysis time and ferritin.



Conclusions: 1.The previous renal transplant hypertension increases the risk of intra-dialysis more than 3-fold relative to non-transplant.
2. The dose of EPO> 450 U / kg / week is a risk factor of hypertension during dialysis, multiplying their risk by 6.
3. Hemoglobin and Kt / V protective factors and that a higher level of RR decrease intradialytic hypertension in 42% and 32% respectively.

PP.42.08 THE NEGATIVE CORRELATION BETWEEN C-REACTIVE PROTEIN AND SERUM ALBUMIN IN CHRONIC HEMODIALYSIS PATIENTS

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Objective: Cardiovascular disease, especially atherosclerosis, is the most important cause of increased mortality in hemodialysis patients.
High levels of CRP are a strong prognostic factor for cardiovascular morbidity and mortality both in non uremic and uremic patients. Hypoalbuminemia (Low serum albumin, Salb) is a powerful risk factor for cardiovascular mortality in hemodialysis patients.
The aim of this study was to evaluate the prevalence of CRP and its correlation with serum albumin.

Design and method: The study involved 25 stable hemodialysis patients. All the patients were treated with HD three times a week, for at least 7 months. The average age of patients was 45.04 years.
The levels of CRP and Salb have been measured.
The patients were divided in two groups based on the levels of CPR.
The first group comprised patients that presented CPR levels lower 6 mg/l and the second group comprised those presenting CRP levels higher than 6mg/l.

Results: 52% of the patients presented CRP levels higher than10mg/l, 60% presented CRP levels > 5mg/l and only in 40% of them CPR levels were lower than 3mg/l. 56% of the patients presented albumin levels <4gr/dl.
A negative correlation between CPR>6mg/l and serum albumin<4mg/dl has been found. (r = -0.25, p<0, 03).

Conclusions: Hemodialysis patients presented higher levels of CRP. The patients which presented hipoalbuminemia had elevated levels of CRP.

PP.42.09 THE IMPACT OF FLUVASTATIN ON HYPERLIPIDEMIA AND PROTEINURIA IN PATIENTS WITH NEPHROTIC SYNDROME

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Objective: Hyperlipidemia is found very often in patients with glomerular diseases, particularly if severe proteinuria is present.
Hyperlipidemia in nephrotic syndrome (NS) results from increased synthesis and decreased catabolism. It is characterized by high levels of total cholesterol (Tchol), triglycerides (TG), LDL and VLDL, while HDL may be normal
Some data suggest that lipid metabolism disorders might contribute to kidney damage.
Statins are supposed to have a reno-protective role and also reduce hyperlipidemia in patients with NS.
The aim of this study is to asses the impact of HMG-CoA reductase inhibitor Fluvastatin on dyslipidemia and proteinuria in patients with NS.

Design and method: The study was performed on 22 patients (13 males and 9 females), over 18 years old (mean age 38.5± 11 years) with glomerular filtration rate (GRF) over 90ml/min and NS with severe hyperlipidemia.
All the patients were treated with corticosteroids alone or in combination with immunosuppressive drugs, but all the patients presented resistance to the treatment.
In addition, the patients were also treated with fluvastatin, at 40 mg daily for a period of 3 months.
The measurements of Tchol, TG, LDL, HDL and proteinuria were realized before and after treatment.

Results: The patients presented T Chol levels of 347±81,4 before treatment and 183±0,76 after treatment p<0.001;
TG levels of 383±17 before treatment and 273±107 after treatment p<0,005
LDL levels of 150±36 before treatment and 101±33 after treatment p<0,001
HDL levels were within normal range in all patients before and after treatment.
There was not observed any significant decrease in proteinuria. In fact, before treatment it was 4,3±1 and after treatment 3,03±1,2 p=0,01.

Conclusions: The 3 month treatment with fluvastatin didn't influence the proteinuria in patients with nephrotic syndrome. However, in order to asses better its impact on proteinuria a long term study is needed.
Fluvastatin demonstrated a great effectiveness in the treatment of hyperlipidemia, because it led to a significant reduction of hyperlipidemia in patients with nephrotic syndrome.

PP.42.10 DIAGNOSTIC AND PROGNOSTIC VALUE OF ACUTE KIDNEY INJURY BIOMARKERS IN PATIENTS WITH ACUTE CORONARY SYNDROME

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Objective: Acute kidney injury (AKI) is associated with high morbidity and mortality. 2012 KDIGO criteria of AKI are based on serum creatinine (sCr) and urine output, but a reliable tool to early AKI diagnose is still lacking. Several potential early predictive biological markers of acute AKI have been suggested. The aim of the study was to evaluate the prognostic value of biomarkers (urine neutrophil gelatinase-associated lipocalin (uNGAL), urine interleukin-18 (uIL-18), serum cystatin C (sCysC) depending the presence of AKI in patients with non-ST-elevation acute coronary syndrome (NSTE-ACS).

Design and method: 288 patients (36% male, 72±12 years (M±SD), body mass index 28±5 kg/m², 8% smokers, diabetes mellitus 23%, previous myocardial infarction (MI) 42%, arterial hypertension 92%, heart failure 36%, atrial fibrillation 23%, known chronic kidney disease (CKD) 16%, blood pressure 142±31/81±15 mmHg, serum creatinine (SCr) 108±55 mumol/l, GFR MDRD 61±23 ml/min/1.73 m²) admitted in intensive care unit with NSTE-ACS (NSTE-MI 66,5%) were examined. AKI was diagnosed according to KDIGO 2012 Guidelines. Early AKI was diagnosed by SCr decrease during hospitalization compared with SCr on admission. Late AKI was diagnosed by SCr increase during hospitalization. Mann-Whitney and Spearman tests were performed. P<0.05 was considered statistically significant.

Results: Prevalence of AKI in NSTE-ACS was 37%. Early AKI was diagnosed in 56%, late AKI in 44%. AKI de novo was established in 80%, AKI on CKD in 20%. Patients with NSTE-ACS and early AKI compared with patients without

AKI had higher sCysC (13143 vs 9273 ng/ml, p<0.01), uNGAL (333 vs 98 ng/ml, p<0.05) and uIL-18 (571 vs 542 pg/ml , p<0.05) on admission. Levels of biomarkers did not differ in patients with late AKI and without AKI. Patients with AKI on CKD compared with AKI de novo had higher uNGAL (508 vs 24 ng/ml, p<0.01) and IL-18 (578 vs 565 pg/ml, p<0.05) on admission. No relationship between biomarkers and in-hospital mortality was revealed in patients with AKI.

Conclusions: In patients with NSTE-ACS biomarkers of AKI – sCysC, uNGAL, uIL-18 - were markers, but not predictors of AKI. Biomarkers of AKI in studied NSTE-ACS population had no prognostic value.

PP.42.11 CAVEOLIN-1 MODULATED RENAL NITRIC OXIDE SYNTHASE DURING HEMORRHAGIC SHOCK WITH AGING

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Objective: Endothelial nitric oxide synthase (eNOS) plays a critical role in the regulation of renal function. Caveolin-1 is an negative regulator of eNOS activity. NO system and caveolin-1 have been identified as modulators of the normal aging process. To evaluated the effect of caveolin -1 on the activity of renal NO system following acute hemorrhage (H) with aging.

Design and method: Groups of young and adult animals: Group C, controls rats ; Group H : rats subjected to H of 20% of blood volume . At 120 min of bledding, we measured NOS activity (in vitro method and NADPH-diaphorase assay). Protein levels of the isoforms of NOS and caveolin -1 was determined by Western blot. eNOS was immunoprecipitated with anti-caveolin-1 antibodies from whole kidney extracts of young and aged rats.

Results: Aging decreases renal NOS activity, while H causes an increase in this parameter in young and adult animals (Group C young : 309 ± 24 pmol.g tej -1.min -1 Group H young : 499 ± 20 * pmol.g tej -1.min- 1, Group C adult: 249 ± 17 <> pmol.g tej -1.min- 1, Group H adult: 449 ± 16 * pmol.g tej -1.min -1 , *p < 0.01 vs. C group of each age group ; <> p < 0.01 vs. young C group). The changes observed in NOS activity were at the expense of changes in histochemical activity in the renal medulla. No changes were observed in the protein levels of the isoforms of NOS and caveolin-1. Immunocolocalization of eNOS and caveolin -1 showed that: a) there was an increased association of eNOS with caveolin-1 with aging , b) H caused a greater dissociation of the complex eNOS/caveolin-1.

Conclusions: The present study demonstrated the involvement of caveolin-1 in the regulation of renal NOS activity in H and aging. The reduced NOS activity observed in aged rats could be due to increased association of eNOS with caveolin-1. H constitutes a stimulus for the dissociation of complex eNOS/caveolina-1 adjusting NO production to the needs of renal tissue to H. This response was independent of age.

PP.42.12 EVALUATION OF DIURETIC'S EFFICACY IN PATIENTS WITH CHRONIC KIDNEY DISEASE AND HYPERTENSION ASSESSED BY AMBULATORY BLOOD PRESSURE MEASUREMENTS

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Objective: The aim of this study was to evaluate the efficacy of diuretics in blood pressure control in hypertensive patients with chronic kidney disease (CKD), based on 24hr ambulatory blood pressure(ABP) monitoring.

Design and method: A cross-sectional study was conducted with 51 hypertensive patients with chronic kidney disease stage III to V (36 males, 15 females), mean age 65.36±11.75, mean eGFR 30.6±12.4 ml/min/1.73 m2, and mean number of antihypertensive drugs 2.5±1.3. Among those 24 subjects were on diuretic therapy. ABP was measured with Microlife WatchBP O3 device and controlled blood pressure was considered as mean BP 24hr <130/80 mmHg, mean awake BP <135/85 mmHg and mean asleep BP <120/70 mmHg. Chi-square test was applied in order to correlate blood pressure control and intake of different categories of antihypertensive drugs while independent sample t-test analysis was applied between ABPM measurements and the intake of diuretics.

Results: Comparing blood pressure control with the intake of centrally acting drugs, calcium channel blockers, b-blockers and renin angiotensin system (RAS) inhibitors/blockers we found non significant relationship (p>0.05). On the other hand blood pressure control was strongly associated with the intake of diuretics agents (p=0.004). Further analysis showed strong correlation between diuretic intake and systolic 24hr-ABP (p=0.036), diastolic 24hr- ABP (P=0.007), diastolic awake ABP (p=0.008) diastolic asleep ABP (p=0.028).

Conclusions: Diuretic agents seem to be most effective in controlling blood pressure in patients with CKD compared to other antihypertensive agents, confirming the need of diuretics as first-line drugs in patients with CKD and hypertension assessed by ABP measurements.

PP.42.13 EVALUATION OF THE EVENING DOSAGE OF ANTIHYPERTENSIVE DRUG IN BLOOD PRESSURE CONTROL AND DIPPING STATUS IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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Objective: To investigate whether the antihypertensive medication later in the day or at bedtime provokes a better control of hypertension and reduces non dipping status in hypertensive patients with chronic kidney disease (CKD).

Design and method: A cross-sectional study was conducted on 51 hypertensive patients with chronic kidney disease stage III to V (36 males, 15 females), mean age 65.36±11.75, mean eGFR 30.6±12.4 ml/min/1.73 m2 and mean number of antihypertensive drugs 2.5±1.3. Among those 29 subjects were receiving evening dose of antihypertensive drug. Ambulatory blood pressure was measured with Microlife WatchBP O3 and controlled blood pressure was considered as mean BP 24hr <130/80mmHg, mean awake BP <135/85mmHg and mean asleep BP<120/70 mmHg. Chi-square test was applied in order to correlate evening dose of antihypertensive drug with blood pressure control and dipping pattern while independent sample t-test analysis was applied between evening dose of antihypertensive drug and ABPM measurements.

Results: Among the patients studied 21 had controlled blood pressure and 41 were non dippers. Evening dose of antihypertensive drug was not correlated neither with blood pressure control nor with the dipping pattern (p>0.05). Further analysis did not demonstrate correlation between evening dose and systolic-diastolic 24hr, awake and asleep ABPM measurements (p=0.67, p=0.843, p=0.86, p=0,903, p=0.125, p=0.902 respectively).

Conclusions: Evening dose of antihypertensive drug seems not to ameliorate the non dipping status and the BP control of hypertensive patients with CKD. Thus, our data do not support the administration of the medication later in the day or even at bedtime.

PP.42.14 LONG-TERM EVALUATION OF CORONARY CALCIFICATIONS IN KIDNEY TRANSPLANTED PATIENTS: A FOLLOW-UP OF 5 YEARS

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Objective: Patients with chronic kidney disease(CKD) have a relevant cardiovascular(CV) risk. Vascular calcification, particularly at coronary levels, have been related to the increased CV mortality. Few data are available on the long term behaviour of coronary artery calcifications(CAC) in kidney transplantation (KTx). Using coronary CT performed at 1month and 5years after KTx we evaluated: 1) the prevalence of CAC; 2) the clinical and biochemical factors related with CAC; 3) the factors implicated with CAC progression.

Design and method: We evaluated 87pts (M=51;mean age 47±12years) transplanted in our unit between 2007 and 2008. Clinical parameters, blood and urinary samples were collected for five years. For the analysis the mean value of these evaluations was considered. At baseline and after 5years from KTx a coronary TC for the evaluation of (CAC) using Agatson score was performed. According to the score obtained, patients were categorized in 4groups both at baseline and at 5th year: 1)0-10; 2)10-100; 3)100-400; 4)>400. The progression of CAC was determined using the formula proposed by Sevrukov (AJR, 2005 Dec;185(6):1546-53).

Results: At baseline and at 5yrs, 43%and 33% of pts were in the 1stgroup, 15%and 17% in the 2nd, 24%and 23% in the 3rd and 13%and 26% in 4th, respectively. CAC at 5yrs were significantly higher than baseline(p<0.0001). Both at baseline and after 5yrs CAC correlated directly with the age(p=0.0001;p=0.0006 resp.) and with each other (p<0.0001). Twenty-two percent of patients had a significant progression of CAC. They had lower levels of PTH and alkaline phosphatase all five years long. Moreover also in the 27%of patients, who worsened their category of CAC, PTH was significantly less. In a logistic model, PTH was the only independent factor inversely related with CAC progression. During the 5 year of KTx only 1patient dead for cerebral haemorrhage and 4 patients restarted dialysis all for chronic rejection.

Conclusions: The prevalence of CAC in CKD patient is quite high, and is related with their age. CAC worsening was observed only in a small part of patients with higher baseline CAC score. CAC progression resulted related with lower PTH and ALP levels.

PP.42.15 HYPERTENSION MANAGEMENT AMONG CHRONIC KIDNEY DISEASE PATIENTS WITH DIABETES

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Objective: Estimating the prevalence of CV risk factors among Hypertenssive Chronic Kidney Disease patients with diabetes. Identifying the drugs used in treating hypertension and determine how effective is the treatment in achieving the target blood pressure. Verifying the factors associated with uncontrolled BP. Determining the progression of renal function among those patients.

Design and method: Retrospective study. Adult patients with CKD and HTN identified from electronic records over a period of 8.5 years starting October 2004. Patient without lab data or without a follow up, pregnant, transplant and those with primary glomerulonephritis were excluded.
Age, gender, BMI, cardiovascular risk profile, kidney function and medications were recorded from the first as well as the last clinic visit. Calculated eGFR by CKD EPI equation. A sample of 64 diabetic patients was matched with 64 non diabetic for age, gender and BMI.

Results: The total CKD patients identified with hypertension were 223, of which 139 were having diabetes. Mean Follow up was 25 months. The mean age was 57 years (SE 0.5). Mean BMI was 28.6 (SE 2.1). Males constituted 67%. Higher prevalent CV risk factors was found among the diabetic subgroup. The mean systolic BP was lower in the non-diabetic patients 136.7mmHg (SE 2.7) as compared to 147mmHg (SE 3.2) in the diabetic subgroup. More antihypertension medication were used in the diabetic as compared to the non-diabetic. A higher percentage of the non-diabetic CKD patients achieved target blood pressure. 67% as compared to 52% among the diabetic. Diabetes, Stroke, Alpha blockers, Vasodilating Beta blockers and vasodilators were among the factors related significantly with uncontrolled BP. Although the mean eGFR reduced more in the diabetic subgroup over the follow up period but that difference was not statistically significant.

Conclusions: Hypertension CKD patients with diabetes have more CV risk factors, required more antihypertensive medications, more diabetic patients ended up having uncontrolled BP after 2 years of follow up. Diabetes, stroke, Alpha blockers, Vasodilating Beta blockers, Vasodilators and NTG were the significant factors associated with uncontrolled BP. Kidney function did not vary significantly among the two subgroups.

PP.42.16 PROGNOSTIC VALUE OF AMBULATORY BLOOD PRESURE MONITORING IN DIABETES

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Objective: Ambulatory blood pressure monitoring (ABPM) provides data of circadian pattern and better predicts cardiovascular risk (CVR).
An elevated prevalence of nocturnal blood pressure fall absence has been observed in patients with diabetes mellitus (DM).
Thus, the main objective was to assess the prognostic value of ABPM in a cohort of patients with DM followed for 10 years.

Design and method: A retrospective study was designed with a random cohort of 766 subjects with DM and hypertension. BP was measured by ambulatory monitoring along 24 hours with a Spacelabs 90207 device adjusting diurnal and nocturnal periods for each patient. Also clinical assessment and blood samples were analysed at the beginning.
Follow-up was based on retrospective review of medical records, and cardiovascular events were recorded (peripheral vascular disease-PVD, coronary artery disease-CAD, heart failure-HF or stroke-S).

Results: We completed the monitoring of 715 subjects (female: 374) and 319 vascular events were recorded.
Previous cardiovascular disease and diabetic nephropathy were worse clinical prognostic factors for cardiovascular disease as both establish increasing incidence of cardiovascular events.
Once ABPM data were analyzed, both nocturnal BP and reversal circadian pattern showed prognostic value and Kaplan-Meier survival curves reported worse cumulative CV event-free survival in non-dippers and risers.

Conclusions: Both nocturnal BP and loss of nocturnal BP fall identified by ABPM, in addition to previous cardiovascular disease (it includes renal dysfunction) better correlates with poor cardiovascular prognosis in patients with DM and hypertension which confirms the importance of prognostic value of ABPM as well as early diagnosis and management in such patients.

PP.42.17 LINKING ARTERIAL STIFFNESS TO THE BIOLOGICAL PROFILE OF INFLAMMATION AND COAGULATION AT HYPERTENSIVE PATIENTS WITH OR WITHOUT DIABETES MELLITUS

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Objective: The objective of the study was to estimate how the arterial stiffness (AS) correlates with the pro-inflammatory and pro-thrombotic unbalances at hypertensive patients (pts) with or without diabetes mellitus (DM).

Design and method: 50 hypertensive pts (mean age = 58.3 ± 9.8 years, 52% males) - group 1 and 50 hypertensive pts with DM, matched for age and sex (mean age = 59.7 ± 10.3 years, 54% males) - group 2. AS was evaluated by measuring carotid-femural pulse wave velocity (PWV) using SphygmoCor system. PWV greater than 12 m/s was considered abnormal. Inflammation profile was estimated by serum measurement of C reactive protein (CRP) and fibrinogen (F). Pro-thrombotic profile was determinate by serum measurement of von Willebrand factor (vWf), antithrombin III (AT III) and plasminogen activator inhibitor (PAI-1).

Results: In group 1, 22 pts (44%) had increased PWV: 12.4 ± 0.2 m/s. In group 2, 24 pts (48%) had increased PWV: 12.8 ± 0.5 m/s. The difference is not significantly statistic between the two groups (p=0.08). In group 1, increased PWV was significantly associated with higher level of CRP (1.88 ± 0.76 mg/L vs 6.43 ± 2.17 mg/L, p=0.02). In group 2, increased PWV was found in a significantly higher proportion at pts with higher level of CRP (2.21 ± 0.84 mg/L vs 8.53 ± 2.07 mg/L, p=0.004) and also with greater proportion of vWf (71.32 ± 24.76% vs 163.42 ± 31.85% , p=0.001) and with higher level of PAI-1 (0.38 ± 0.19 u/mL vs 0.66 ± 0.21 u/mL , p=0.04).

Conclusions: Hypertensive pts with DM have increased PWV in a greater but not significant proportion than hypertensive pts without DM. Increased PWV at hypertensive pts seems to reflect a proinflammatory status. Moreover, increased PWV at hypertensive pts with DM appears to express both pro-inflammatory status and pro-thrombotic unbalance.

PP.42.18 HYPERHOMOCYSTEINEMIA AND MTHFR POLYMORPHISM IN DIABETIC NEPHROPATHY

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Objective: Homocysteine (hcy) is an intermediate metabolite in the metabolic pathway of methionine and cysteine. Hyperhomocysteinemia (hmct) is an established, independent risk factor for atherosclerosis. The methylenetetrahydrofolate reductase (MTHFR) polymorphism has been shown to result in increased total hcy concentrations and low folate levels caused by a decreased enzyme activity. The aim of the present study was to determine hcy serum levels and to evaluate MTHFR-1 (C677T) and MTHFR-2 (A1298C) in patients with diabetes mellitus (DM) type 2 and diabetic nephropathy (DN) in early stages.

Design and method: 50 patients with CKD 1st and 2nd stage and DN were included as controls there were 40 healthy individuals.

Results: 40 of the patients had increased serum levels of hcy. From them 13 presented the polymorphism MTHFR-1 (75%) and 13 the MTHFR-2 (43%). From controls 5 presented HMCT, 3 presented the MTHFR-1 and 2 MTHFR-2.

Conclusions: Increased serum levels of MTHFR-1 C677T have been shown to be associated with HMCT in patients with DN.

PP.42.19 INCREASED SERUM LEVELS OF GELATINASE-A ARE CORRELATED WITH VASCULAR ENDOTHELIAL GROWTH FACTOR-A IN HYPERTENSIVE PATIENTS IN EARLY STAGES OF TYPE 2 DIABETIC NEPHROPATHY

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Objective: Gelatinase-A, reported also as matrix metalloproteinase-2 (MMP-2), is the main enzyme that degrades collagen type-IV (col-IV) and has been implicated in chronic kidney disease (CKD) and cardiovascular disease (CVD). It remains controversial the mechanism by which VEGF works in the kidney, as well as in the vessels at least in the early stages of diabetic nephropathy (DN) and CKD. Whether VEGF-A is detrimental in early stages of DN or other renal conditions has not yet been clearly answered. The aim of the present study was to determine the serum levels of MMP-2 and VEGF-A and to investigate their potential correlation with the atherosclerotic markers and albuminuria in hypertensive patients with early stages of type 2 DN.

Design and method: CKD patients of stages 1 and 2 with type II DN (n=40) were included. As controls, there were two groups, patients with diabetes type II without CKD (n=40) and healthy individuals (n=40). Clearance of creatinine (Clcr) and albumin excretion were examined in the 24h urine. VEGF-A and MMP-2 levels were measured by an ELISA method. Intima media thickness of carotid and femoral arteries and atheromatic plaque were evaluated by a high resolution ultrasonography

Results: There was a notable difference between VEGF-A and MMP-2 levels in each of the groups.The difference between VEGF-A serum levels in DN group and healthy individuals was 38460 ($p<0.0001$). The difference between levels of MMP-2 in DN and healthy individuals was 34132 ($p<0.0001$).MMP-2 levels indicated a strong positive correlation with albuminuria in patients as opposed to controls ($p<0.0001$).MMP-2 serum levels were strongly correlated with VEGF-A serum levels in the group of DN (pearson correlation 0.520, $p<0.0001$). There was a statistically significant correlation between levels of VEGF-A, MMP-2 and albuminuria ($p<0.0001$). Further, VEGF-A and MMP-2 levels were independently correlated with IMT and atheromatic plaque ($p<0.0001$).

Conclusions: Our study suggests that serum levels of VEGF-A and MMP-2 might present independent risk factors of hypertension, atherosclerosis and albuminuria, at least in the early stages of type II diabetic nephropathy to the progression of CKD.

PP.42.20 MATRIX METALLOPROTEINASE-2 IS ASSOCIATED WITH OXIDATIVE STRESS IN HYPERTENSIVE PATIENTS WITH TYPE 2 DIABETIC NEPHROPATHY IN EARLY STAGES

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Objective: Matrix metalloproteinase-2 (MMP-2) is considered to be the main enzyme that degrades col-IV and has been implicated in chronic kidney disease (CKD) and cardiovascular disease (CVD). Collagen type-IV (col-IV) is the major collagenous component of the extracellular matrix (ECM) which constitutes the architectural structure of the vessels' basement membrane (BM) and the glomerular BM (GBM). The evolution of oxidant stress from early stages of renal function decline is not fully clear. The concentration of 15-F2t-isoprostane (15-F2t-IsoP) in serum has been considered as a reliable biochemical index of oxidative stress in patients with several pathological conditions including diabetic nephropathy (DN) and CKD. However, there is no knowledge about the potential correlation between MMP-2 serum levels and oxidative stress in hypertensive patients in early stages of type II DN. The aim of this study was to investigate the serum levels of MMP-2 and their potential correlation with 15-F2t-IsoP in early stages of type II DN.

Design and method: CKD patients of stages 1 and 2 with type II DN (n=40) were included and 18 of them were hypertensive. Patients with active inflammatory disease or malignancy were excluded. As controls, there were two groups, patients with diabetes type II without CKD (n=35) and healthy individuals (n=35). MMP-2 and 15-F2t-IsoP levels were measured by an ELISA method. Intima media thickness (IMT) of carotid and femoral arteries and atherosclerotic plaque were determined by a high resolution ultrasonography.

Results: The levels of MMP-2 were significantly higher in patients than in the control groups and their difference is 34132 ($p<0.0001$). The difference between 15-F2t-IsoP levels in patients and in controls is 15510 ($p<0.0001$). Clcr and albumin excretion levels were statistically different between patients and controls ($p<0.001$), as well as in all four groups ($p<0.001$). Further, MMP-2 levels were independent correlates of oxidative stress, IMT as well as of atherosclerotic plaque ($p<0.01$). This association seems stronger under the presence of hypertension.

Conclusions: This study suggests that serum levels of MMP-2 were found to be independent risk factors of oxidative stress and hypertension in early stages of type II diabetic nephropathy.

PP.42.21 GENDER DIFFERENCES IN THE MANAGEMENT OF HYPERTENSION IN DIABETIC PATIENTS

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Objective: The treatment and control rates of hypertension exhibit some differences between diabetic men and women. The objective of the study was to determine the gender differences in the clinical management of arterial hypertension in patients with diabetes.

Design and method: The study included 187 patients with arterial hypertension and diabetes hospitalized in the Internal Medicine Clinic of a University Emergency Hospital. We analyzed data from the hospital record database.

Results: The distribution by sex: 83 men (44.39%) and 104 women (55.61%). Women were older than men (mean age 71±3 years vs 67±4 years) and had higher values of systolic and diastolic blood pressure, heart rate and total cholesterol than men. Regarding the treatment, the majority of patients were taking at least 2 antihypertensive agents: 5.88% one drug, 66.31% two drugs, 18.18% three drugs and 5.34% four drugs. There was no significant difference between the number of antihypertensive drugs in both sexes. Instead, women were treated with more antidiabetic agents; also, more women received insulin (33.65% vs 19.27%). More women than men were treated with betablockers (13.46% vs 9.63%) and diuretics (34.61% vs 27.71%). More men received angiotensin converting enzyme inhibitors (44.57% vs 29.80%). Blood pressure was better controlled in men than women (40.96% vs 27.88%).

Conclusions: Hypertensive diabetic women from our study were older than men. There were no gender differences in the number of drugs prescribed, but men were more frequently treated with angiotensin converting enzyme inhibitors and women with diuretics or betablockers. The majority of hypertensive diabetic patients, independent of gender, were treated with dual antihypertensive therapy. Diabetic hypertensive women had lower control rates of hypertension.

PP.42.22 EFFECT OF LIRAGLUTIDE ON 24-HOURS AMBULATORY BLOOD PRESSURE IN HYPERTENSIVE PATIENTS WITH TYPE 2 DIABETES MELLITUS

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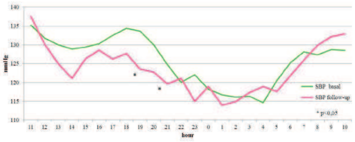
Objective: Hypertension is often associated with type 2 diabetes mellitus (T2DM) and is closely related to an increase of Cardiovascular Risk.
Previous studies (LEAD ® studies) support the effectiveness of ancillary effect of glucagon-like peptide-1 receptor agonist (GLP-1 RA) on reduce blood pressure values. In particular Liraglutide is able to decrease office systolic blood pressure (SBP) between 2.7 and 6.6 mmHg after 6 months of therapy.

The aim of this study was to investigate the effect of Liraglutide on 24-Hours Ambulatory Blood Pressure (ABPM).

Design and method: 10 hypertensive and T2DM patients (mean age 64 years; mean T2DM duration 9.6 years; mean BMI 34.9 kg/m²) on drug therapy with good blood pressure control (mean office blood pressure: 135/82 mmHg), underwent to ABPM (Spacelabs 90207) before and after 4 months of treatment with Liraglutide. Statistical analysis performed with IBM SPSS software.

Results: Delta blood pressure values at the baseline and after treatment are collected in the following table, SBP profile on 24 hours is shown in the graph.

	Δ SBP		Δ DBP		Δ HR	
Patients	*Daytime*	*Nighttime*	*Daytime*	*Nighttime*	*Daytime*	*Nighttime*
1	-12.2	7.4	-8.0	7.7	6.2	5.9
2	0.8	-5.1	8.5	-1.6	3.5	-5.7
3	-5.2	2.9	-0.9	3.0	6.7	8.1
4	-5.5	2.3	-4.9	5.9	-4.9	3.3
5	-5.3	-4.0	-5.2	-2.9	8.8	8.1
6	-1.9	-16.4	-0.1	-4.4	20.3	5.6
7	-10.6	-5.1	-1.6	3.6	6.9	11.0
8	0.5	3.0	3.6	3.4	-4.2	4.4
9	4.5	5.3	5.4	4.3	0.2	0.3
10	5.2	3.7	3.5	4.7	2.5	14.1



An improved dipping pattern on ABPM at 4 months of therapy were shown by some subjects.
In the postprandial hours a marked drop in blood pressure was observed, although statistical significance was achieved in the late afternoon.

Conclusions: This study confirms that Liraglutide could reduce systolic blood pressure.
No significant differences were observed on diastolic blood pressure.
More results might be achieved with a larger sample and with higher baseline blood pressure values.

PP.42.23 THE FINNISH DIABETES RISK SCORE (FINDRISC) AS AN INDICATOR OF THE GLYCEMIC PROFILE OF NON-DIABETIC HYPERTENSIVES

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Objective: The Finnish Diabetes Risk Score questionnaire (FINDRISC) is a practical validated tool to estimate the risk for future type 2 diabetes mellitus (T2DM). This study sought to evaluate the potent associations of the FINDRISC with the metabolic profileof newly-diagnosed essential hypertensives (EH).

Design and method: 757 consecutive non-diabeticpatients (52±13 years, 53% males, body mass index 29±5kg/m²) were studied.Fasting plasma glucose (FPG), 2-hour post-load glucose (2hPG) and HbA1c were measured. Patients with all three measures in the normal range were considered as euglycemic, while those with more than one measure in the prediabetic range were considered as having advanced glycemic impairment (AGI). Age, BMI, waist circumference, history of antihypertensive drug treatment and high blood glucose, physical activity and daily consumption of fruits and vegetables were determinedfor the calculation of FINDRISC. The score ranges from 0 to 26 points with higher score representing higher T2DM 10-year risk.

Results: The glycemic profile of the participants was as follows: euglycemic 56.34%, impaired fasting glucose (IFG) 22.8%, impaired glucosetolerance(IGT) 0.26%, impaired HbA1c 10.6%, while 10% of the patients presented AGI. The prevalence of pre-diabetes and metabolic syndrome (MS; IDF criteria)was 48% and 53%, respectively.Regarding FINDRISC, 13.4% of patients hadscore <7, 37.1%7-11, 21.6%12-14, 24.1% 15-20 and 3.8% >20. Euglycemic patients had score 10±4 while pre-diabetics 14±4(p<0.05). MS patients had FINDRISC 14±4 while non-MS patients 9±4 (p<0.05). The score was 14±4 in AGI, 13±4 in IFG and 12±4 in impaired HbA1c.54.1% of patients with score>=12 had at least oneglycemic measureabnormal,while 67% of those with score<12 had all measuresnormal. FINDRISK was correlated to FPG (r=0.32,p<0.001), 2hPG (r=0.23,p=0.027) and HbA1c (r=0.29,p<0.001). The area under ROC curve for FINDRISC to detect dysglycemia was 0.67 (95%CI 0.63-0.71), with the optimal cut-off level being 11 points (sensitivity 72%, specificity 61%).

Conclusions: Almosthalf of middle-aged, newly-diagnosed hypertensives are pre-diabetics. The FINDRISC is proved as a useful, cost-effective tool for identifying these individuals.

PP.42.24 RELATIONSHIP BETWEEN SOCS-3 GENE POLYMORPHISM AND ABNORMAL GLUCOSE METABOLISM IN THE XINJIANG UYGUR POPULATION

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Objective: To investigate the relationship between SOCS-3 gene polymorphism and abnormal glucose metabolism in Xinjiang Uygur population.

Design and method: According to different plasma glucose levels, 1232 individual in xinjiang hetian area were divided into 3 groups that is 451 patients with pre-diabetes(PD group),252 patients with type 2 diabetes mellitus (T2DM group) and 529 healthy people as normal controls (NC group). Based on HapMap we selected the polymorphismrs rs12953258,rs4969168 ,rs9914220as haplotypes,tagging SNP (htSNP) sufficiently covering the genetic variation of the whole gene. We therefore examined the association between rs12953258,rs4949168and rs914220within SOCS-3 and abnormal glucose metabolism in the Xinjiang Uygur population in three independent study populations; The genotype and allele frequencies and relative clinic data were compared among groups.

Results: The T2DM study with 451 individuals showed the thomozygosity for the C allele of rs12953258 polymorphism of SOCS-3 was associated with increased diabetes risk(OR=1.756,95%CI(1.168,2.640)). In addition, association between rs4949168,rs914220 and abnormal glucose metabolism in the Xinjiang Uygur population was not found. Age,total cholesterol(CHOL) and BMI were risk factors of DM development,total cholesterol(CHOL)and low high-density lipoprotein (HDL-C)was risk factors of PD development in Uygur people.

Conclusions: The C allele of rs12953258 polymorphism of SOCS-3 gene may be an independent risk factor for abnormal glucose metabolism in Xinjiang Uygur population.

PP.42.25 BENEFICIAL EFFECTS OF PURIFIED SARDINE PROTEINS ON HYPERGLYCEMIA AND REDOX STATUS IN TYPE 2 DIABETIC RATS

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Objective: This study was designed to examine the effect of purified sardine proteins on hyperglycemia and redox status in streptozotocin-induced diabetic rats fed a high fat diet (HFD).

Design and method: Type 2 diabetes was induced by a high fat diet and low dose streptozotocin (STZ). Diabetic rats were randomly divided into four groups and were fed casein (CAS) or sardine proteins (SP) combined with 30% or 5% lipids, for 4 weeks. Serum and liver Cholesterol total (CT) and triacylglycerols (TG) were quantified. In liver and serum, oxidative stress was determined by thiobarbituric acid reactive substances and hydroperoxides determination. The antioxidant defense was evaluated by measuring superoxide dismutase (SOD), glutathione peroxidase (GPx), glutathione reductase (G-Red) and catalase (CAT) activities.

Results: HFD with CAS or SP increased serum glucose, insulin resistance (HOHA-IR), serum and hepatic TC and TG. In contrast, these parameters lowered in rats fed SP combined with 5 or 30% lipids. Serum insulin values were reduced by 51% in SP vs CAS. In the serum and liver, the TBARS and hydroperoxides were increased in rats fed HFD, whereas, in CAS-HF vs CAS, carbonyls were increased by 50% in the liver. Conversely, serum and liver TBARS, hydroperoxides and carbonyls were significantly decreased in rats fed sardine proteins whatever the containt of the lipids 5% or 30% in the diet. Serum SOD, Gred and CAT were decreased in rats fed HFD. Similary, in the liver, SOD, GPx, Gred and CAT were reduced by (47%), (65%), (90%) and (33%), respectively, in CAS-HF vs CAS group. However, a significant increased in the serum and hepatic antioxidant enzymes activities were observed in rats fed sardine proteins whatever diet (5% or 30% lipids).

Conclusions: These findings indicate that purified sardine proteins may be effective for correcting hyperglycemia and preventing diabetic complications by potentiating the antioxidant defense system in high fat diet/streptozotocin diabetic rats.

PP.42.26 NEPHROANGIOSCLEROSIS AS CAUSE OF CHRONIC RENAL FAILURE IN TYPE 2 DIABETES: LONG-TERM OUTCOMES AFTER A MULTIFACTORIAL THERAPEUTIC INTERVENTION

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Objective: To evaluate clinical-therapeutic long-term impact of nephroangiosclerosis (NAE) as a cause of CRF in patients with Type 2 Diabetes (2DM).

Design and method: We performed a retrospective,cross-sectional, analysis of 960 2DM patients with CRF (eGFR < 60 ml/min/1,73m2) followed in our reference Service for an average of 72± 15 months (range:12 - 128). According to the ethiology of CRF 794 (82,7%) were NAE (Mean age 67±12 years. 62% males. Initial sCreatinine (sCr) from 1,6 to 3,4 mgdl), 142 (14,5%) were Establish Diabetic Nephropathy, and 24 (2,8%) other ethiologies. Anthropometric and clinical features (BMI, Waist circunference, BP and associated Vascular RFs and Cardiovascular complications,evolution of metabolic parameters and renal function (sCr,eGFR and urinary protein excretion rate (UAER), as well as treatment applied to patients during follow up were o analyzed.

Results: Prevalence associated VRFs and CVCs (%) (Males vs Females): Hypertension (99,7 - 100), Obesity (56 - 58), Central Obesity (76 - 69(*)), Dyslipidemie (88 - 79 (*)), Metabolic Syndr. (66 - 62 (*)), Smoking (24 - 8 (*)), Stroke (5,5 - 4,2), IHD (46 - 29 (**), CHF (10 - 7,3) and Peripheral Artery Disease (34 -15 (*)). Initial vs final values in follow-up: BP (mmHg): (158±16 / 94±10 vs 136±11 / 81±7 (**); sCr (mgdl) (2,13±0,7 vs 1,76±1,1 (*)), eGFR MDRD (ml/min) (42±13 vs 46±18 (ns). UAER (mg/24 h.). (890±210 vs 118±82 (**). LDl-ch (mgdl): 146±36 vs 102±23 (**). BP < 140/90 mmHg (%): (36 vs 82 (**) and LDL-ch < 100 mgdl (24 vs 76% (**). Doubled sCr values:77 - 9,7%. Patients who entered in dialysis. 27 - 3,4%. 6 patients died due to cardiac events. (*) p<0.05, (**) p<0.001). Therapeutic regimen at end follow up:Use of statins: 92%, Antiplatelet 83%, Antihypertensives (%). RAS blockers (97), CC Blockers (74),Loop Diuretics (88), Betablockers (39), Carvedilol (62) and Doxazosin (59).

Conclusions: NAE is the first cause of CRF in type 2 diabetic patients, being more common in men who also had a worse cardiometabolic risk profile. A multifactorial therapeutic approach can stabilize longterm renal function to ESRD in most patients.

PP.42.27 THIOREDOXIN INTERACTING PROTEIN (TXNIP) IS RELATED TO BETA CELL DYSFUNCTION AND INCREASING MARKERS OF OXIDATIVE STRESS IN TYPE-2 DIABETIC PATIENTS

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Objective: To evaluate the expression of TXNIP and cytokines (IL-1beta, IL-6 and TNF-alpha) in peripheral mononuclear cells from type-2 diabetic patients with normal and obese nutritional status.

Design and method: 20 type-2 diabetic males with normal nutritional status (DM); 20 obese type-2 diabetic subjects (OBDM) and 20 controls (Cn) were evaluated. We determine biochemical parameters: fasting glycemia, glycosylated hemoglobin (HbA1c), hsCRP, TBARS, AGES, 8-isoprostanes, heme oxygenase activity (HO) and lipid profile. We extracted total RNA from peripheral mononuclear cells and the RNAm relative abundance of TXNIP, IL-1beta, IL-6 and TNF-alpha was measured by qRT-PCR.

Results: OBDM subjects had higher weight, BMI and abdominal circumference than DM and Cn (One way ANOVA, p<0.0001). In biochemical parameters we found that DM had higher fasting glycemia than OBDM and Cn (One way ANOVA, p=0.0034), however OBDM had higher HbA1c and hsCRP than DM and Cn (One way ANOVA, p<0.0001 and p=0.0158, respectively). In terms of oxidative stress, DM had higher HO activity than OBDM and Cn (One way ANOVA, p=0.0024), TBARS and AGES were increased in both DM and OBDM (One way ANOVA, p<0.0001 and p=0.0008, respectively). The expression of TXNIP was significantly higher in DM than Cn and OBDM (Kruskal Wallis, p=0.0074); IL-1beta, IL-6 and TNF-alpha relative abundance were higher in DM and OBDM, being IL-6 and TNF-alpha especially higher in OBDM (Kruskal Wallis, p<0.0001, for all of them). TXNIP expression was correlated positively with fasting glycemia and AGES in DM (r=0.72, p=0.006; r=0.59, p=0.0067, respectively) and negatively with HOMA-beta (r=-0.44, p=0.0386, respectively). In OBDM subjects there were no correlation.

Conclusions: The data suggest that the control of the fasting glycemic independently to the nutritional status represents the higher risk factor for beta cell dysfunction and increasing of oxidative stress markers.

PP.42.28 URINARY PLASMIN ACTIVATES THE EPITHELIAL SODIUM CHANNEL IN DIABETIC NEPHROPATHY

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Objective: In nephrotic syndrome, plasminogen is aberrantly filtered from plasma to preurine and activated by urokinase-type plasminogen activator (uPA) to plasmin that may activate the epithelial Na+ channel (ENaC) by proteolytic cleavage. At low plasmin concentration cleavage of ENaC involves prostasin. Diabetes is often accompanied by hypertension and microalbuminuria. We hypothesized that plasmin is lost to preurine in diabetic nephropathy and that urinary plasmin may activate ENaC current.

Design and method: Cross-sectional study including type 1 diabetes patients with nephropathy (n=19) or without nephropathy (control, n=19) matched on age, gender and diabetes duration. Plasma, spot urine samples, 24 h urine collections and 24 h blood pressure recordings were obtained.

Results: 24 h urinary protein excretion was 1.8±0.5 (nephropathy) and 0.07±0.03 g/day (control, p=0.0007). Urinary plasmin(ogen)/creatinine ratio (172±1.9×10-3 vs. 3.48×10-1 ±1.3×10-3 µg/g, p<0.0001) and urinary prostasin/creatinine ratio (33.8±5.5 vs. 9.4±2.2 µg/g, p<0.0001) as assessed by ELISA were significantly higher in nephropathy than control group and correlated with urine albumin concentration (p<0.0001). Plasma prostasin concentration was significantly higher in nephropathy than control group (10.2±0.4 vs. 8.7±0.4 µg/ml, p=0.0114), whereas plasma plasmin(ogen) concentration did not differ. Western blotting supported the presence of urinary plasmin(ogen) and urinary prostasin in nephropathy, but not in control group. uPA activity did not differ between groups (50.2 vs. 42.5 mUnits/µg, 95 % confidence interval (CI): 40.8-61.7 vs. 35.4-50.9 mUnits/µg). Urine from nephropathy patients (n=5) increased inward, amiloride-sensitive current almost fourfold compared to control group (n=5) as evaluated by whole-cell patch clamp on murine single collecting duct cells (62.6±7.8 vs. 16.5±3.9 %, p<0.0001).. Mean 24 h systolic, but not diastolic, blood pressure was significantly higher in nephropathy (144/79 mmHg, 95 % CI: 136.0–151.9/74.9-83.2) than control group (132/75 mmHg, 95 % CI: 126.2-137.4/71.8-77.8, p=0.0117) despite being treated with 3.0±0.4 (nephropathy) vs. 1.4±0.3 (control) antihypertensive drugs including diuretics. Mean 24 h blood pressure correlated significantly with urine plasmin(ogen) concentration (p=0.0102).

Conclusions: Aberrant presence of plasmin activity in urine in diabetic nephropathy is capable of activating ENaC and may contribute to insufficient hypertension control.

PP.42.29 PREVALENCE AND METABOLIC RISK FACTORS OF DIABETES AND PRE-DIABETES IN MALAWI

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Objective: Diabetes is rising globally at an alarming rate but data from sub-Saharan Africa are few. Detailed studies are needed to gain better understanding of this condition and explore local determinants in order to inform health planning and the design of future interventions. This ongoing study aims to investigate the prevalence of diabetes, pre-diabetes and their risk factors among urban and rural Malawian.

Design and method: As part of our non-communicable diseases research programme in urban Lilongwe and in our rural Health and Demographic Surveillance Site in Karonga, we will enrol 40,000 Malawians who are 18 years or older. We report data collected in the first 7 months of the study (N=7,651 adults). A questionnaire on demographic and lifestyle factors was administered by trained interviewers. Anthropometry data were collected using a standard protocol. Plasma glucose and lipid levels were measured after 8-hour overnight fasting. Diabetes and pre-diabetes were defined based on the 2010 American Diabetes Association criteria.

Results: The median (IQR) age was 33 (24-45) years. The overall prevalences of diabetes and pre-diabetes were 1.9% (95% CI, 1.6% -2.2%) and 4.7% (95% CI, 4.2% -5.2%) respectively. Diabetes prevalence was significantly higher among the urban population (2.5%; 95% CI: 1.9% -3.0%) compared with the rural population (1.5%, 95%CI, 1.1% -1.9%, p=0.02) but pre-diabetes prevalences were similar (5% among urban and 4.6% in rural, p=0.35). The prevalence of diabetes differed by age-group: 0.2%, 1.9% and 9.8% for age groups <30, 30-44 and >=45 years respectively. Neither diabetes nor pre-diabetes prevalences differed between men and women. Central obesity, body mass index elevated levels of total cholesterol, LDL-cholesterol and triglyceride, and lower levels of HDL-cholesterol were all associated significantly with higher risks of both diabetes and pre-diabetes (p<0.01 in each case).

Conclusions: Rates of diabetes and pre-diabetes in Malawi are alarming, especially among urban dwellers, and could have devastating consequences. There is an urgent need to identify effective and sustainable interventions to control and prevent diabetes in Africa.

PP.42.30 RISK FACTORS FOR DEVELOPMENT OF DIABETIC NEPHROPATHY IN CHILDHOOD-ONSET TYPE 1 DIABETES

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Objective: To identify risk factors for its association with any diabetic nephropathy.

Design and method: In this retrospective case-control study we followed 82 diabetic patients (20 with microalbuminuria, 23 with macroalbuminuria and 39 controls – with normoalbuminuria) with childhood-onset type 1 diabetes mellitus (T1DM) and 20 year history of the disease in Moscow district. All patients were matched by age, sex and duration of diabetes. The relation between possible risk factors and development of micro- and macroalbuminuria was analysed with the use of multivariable regression models. Variables included in the model were: age, sex, age at onset of diabetes, duration of diabetes, glycosylated hemoglobin (HbA1c) level, lipids and blood pressure.

Results: In comparison with normoalbuminuric subjects, both micro- and macroalbuminuric diabetic subject had significantly higher levels of diastolic and systolic blood pressure, lipid values and HbA1c. However, when all possible risk factors were tested in a multivariable model, only HbA1c (odds ratio [OR] (95% CI) 3,1 (1,1 – 9,5) (p<0,05)) and triglycerides [OR] (95% CI) 3,0 (1,7 - 5,4) (p<0,01) showed a significant correlation to microalbuminuria. In logistic regression,variables independently related to macroalbuminuria were HbA1c [OR] (95% CI) 4,4 (1,1 – 4,7) (p< 0,05) and systolic blood pressure [OR] (95% CI) 3,4 (1,5 – 7,8) (p<0,01).

Conclusions: In childhood - onset type 1 diabetes after 20 years of diabetes, the only inadequate glycemic control and dyslipidemia are main risk factors of microalbuminuria, whereas poor glycemic control and hypertension are main risk factors of macroalbuminuria

PP.42.31 THE VASCULAR PROFILE OF A HYPERTENSIVE ROMA PATIENT. DATA FROM THE ROMA STUDY

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Objective: To evaluate the vascular profile of the Roma patients with known or newly diagnosed hypertension.

Design and method: Eight hundred and six adult subjects (age range 18-82 years) from two Roma communities of Bucharest were included, between 2012 and 2013, regardless of medical history, and screened for major cardiovascular (CV) risk factors. Further, 271 subjects with hypertension (known and newly diagnosed) were studied (33.6%). We performed routine evaluation of the hypertensive patient as recommended in the ESH guideline. We recorded: demographic and anthropometric data, presence of major CV risk factors and blood pressure measurements with appropriately sized cuffs, presence of left ventricle hypertrophy on echocardiography studies using left ventricle mass index (Devereaux formula), peripheral arterial disease (ankle-brachial index < 0.9 in either limb), increased arterial stiffness (pulse wave velocity >10m/s), microalbuminuria on dipstick and glomerular filtration rate estimated using CKD-EPI study equation. Associated conditions such as diabetes mellitus (known or newly diagnosed), hyperuricemia (>6 mg/dl in females; >6.8 mg/dl in males) were noted. Visceral obesity was defined as waist circumference >102 cm in males and >88 cm in females.

Results: The hypertensive Roma patient displays a vascular profile with an impressive CV burden. There were no statistically significant differences between sexes, except for prevalence of smoking and obesity (BMI, visceral) where women are significantly more affected. For other results see table.

Parameters	Females	Males	Total
Gender, No (%)	172(63.46%)	99(36.53%)	271(100%)
Average age ±SD (years)	56.18±11.32	55.26±10.07	55.84±10.87
Smoking, %	41.28%	54.55%	46.13%
Physical inactivity, %	76.74%	67.68%	73.43%
Visceral obesity, %	81.98%	52.53%	71.22%
Obesity (BMI>30), %	60.47%	21.21%	46.13%
Dyslipidemia, %	45.35%	44.44%	45.02%
Hyperuricemia, %	29.07%	25.25%	27.68%
Diabetes mellitus, %	29.65%	31.31%	30.26%
Pulse wave velocity >10 m/s, %	73.25%	68.68%	73.06%
Peripheral artery disease, %	52.91%	52.53%	52.77%
Left ventricle hypertrophy, %	45.93%	47.47%	46.49%
Chronic Kidney Disease, % eGFR<60ml/min/1.73m2	8.14%	3.03%	6.27%

Conclusions: In a hypertensive population with a very high prevalence of CV risk factors the prevalence of vascular injury is very high. With a prevalence of 50% smokers, 30% diabetics and more than half obese, the population displayed a very high prevalence of peripheral artery disease. Pulse wave velocities as marker of aortic stiffness were significantly increased in over three quarters of patients evaluated.

PP.42.32 PULMONARY HYPERTENSION IN PERITONEAL DIALYSIS AND HEMODIALYSIS PATIENTS

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Objective: Pulmonary hypertension (PH), a disease which carries substantial morbidity and mortality, has been reported to occur in 25%–45% of dialysis patients. To compare the pulmonary artery hypertension (PAH) in hemodialysis (HD) and peritoneal dialysis (PD) patients and its relation with diastolic dysfunction and survival of patients in dialysis therapy).

Design and method: This is an observational study started on January 2011, studied 80 stable HD patients (females 37.5%, mean age 50.36±12.34years) and 45 PD patients (females 40%, mean age 55.07±13 years) on renal replacement therapy (RRT) for more than 3 months. Serum biochemical parameters were collected one month before echocardiography for each patient. The echocardiographic techniques and calculation of different cardiac dimensions and volumes were performed according to the guidelines of the American Society of Echocardiography. Doppler echocardiography were used to determine the pulmonary artery pressure (PAP). PAH was defined as a systolic pulmonary artery pressure (SPAP) >=35 mmHg. Diastolic dysfunction (DD) was evaluated using (E/E') ratio, by tissue Doppler imaging in peritoneal dialysis (PD) and hemodialysis (HD) patients. To rule out secondary PAH, patients with pulmonary disease, collagen vascular disease, and volume overload at the time of echocardiography were excluded.

Results: According to the echocardiographic findings, PAH was found in 26 (32.5%) patients of HD group and in 9 (20%) patients of PD group (p=0.035). It was found a moderated correlation between SPAP and E/E': Spearman correlation coefficient= 0.295, p=0.001. This relationship was found both in HD (Spearman correlation coefficient= 0.315, p=0.005) and in PD group (Spearman correlation coefficient= 0.318, p=0.033). Significant higher value of SPAP was found in patient with CV mortality in comparison with patients alive in therapy: 40.27±9.145 vs 33.29±6.37 (p=0.011).

Conclusions: PAH seems to be more frequent in patients undergoing HD than patients in PD group. Arteriovenous fistula and anemia may have a contribution in it. Echocardiographic findings demonstrate an association between SPAP and diastolic dysfunction in both HD and PD groups. Higher SPAP is associate d with higher mortality.

PP.42.33 THE VALUE OF RENAL VEIN RENIN MEASUREMENT TO PREDICT BLOOD PRESSURE IMPROVEMENT AFTER PERCUTANEOUS REVASCULARISATION AND STENTING FOR RENAL ARTERY STENOSIS

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Objective: The purpose of this study is to evaluate the value of plasma renin activity (PRA)of renal vein to predict blood pressure (BP) response in patients with renal artery stenosis (RAS) after renal angioplasty and stenting.

Design and method: We studied 57 hypertensive patients who were highly suspected of renovascular hypertension (RHV) between 2002 and 2013 in Department of Hypertension at Shanghai Ruijin Hospital. The patients underwent renal artery angiography to make a definitive diagnosis. Before the angiography, the PRA of bilateral renal vein and the infrarenal inferior vena cave were measured. 24h ambulatory BP recordings were obtained before intervention and follow-up.

Results: Thirty-four patients were diagnosed as having RAS, 27 were Uni-RAS and 7 were Bi-RAS. 26 patients underwent PTRA. The remaining 28 had no intervention treatment. None of the different indexes that can be derived from renal vein renin measurements clearly discriminated between the patients who did benefit from intervention, and those who did not.

Conclusions: In conclusion, the value of renal vein renin measurements is limited for deciding whether to revascularize a kidney with renal artery stenosis.

PP.42.34 THE STUDY OF SIDE OF THE GLOMERULAR FILTRATION RATE USED FOR SCREENING INDICATIONS FOR INTERVENTIONAL TREATMENT FOR RENAL ARTERY STENOSIS

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Objective: As the results of a number of large clinical randomized controlled trials have published,the effects and prognosis of interventional treatment for ARAS are becoming controversial. Early diagnosis,correct assessment of renal function and appropriate treatment can reverse and prevent disease progression to some extent.Currently intervention especially percutaneous transluminal renal artery stenting angioplasty (PTRAS) has become the primary means of treatment for ARAS,but it lacks effective methods of screening indications for interventional treatment for ARAS.

Design and method: To evaluate the efficacy of interventional treatment for ARAS by comparing the change of blood pressure,kidney function especially side of glomerular filtration rate measured by renal dynamic imaging (Tm-GFR) and other indicators of ARAS patients before and after interventional treatment and to explore a fundermental renal function which can get the maximum benefit from interventional treatment through statistical analysis to provide a basis for choosing indications for clinical intervention.

Results: Totally 60 patients (36 males,24 females) were divided into unilateral ARAS group (46 cases) and bilateral ARAS group (14 cases) according to the narrow type.Unilateral,bilateral ARAS patients' clinical systolic blood pressure and ambulatory blood pressure were significantly lower than those before intervention,and the number of drugs also decreased significantly ($P<0.01$). Unilateral ARAS patients' serum creatinine,urinary A/C ratio,24-hour urine protein and total Tm-GFR did not change significantly but ipsilateral Tm-GFR was significantly higher after intervention ($P<0.05$),bilateral ARAS patients' serum creatinine,urinary A/C ratio,24-hour urine protein did not change significantly but total Tm-GFR and the lower side of Tm-GFR were significantly increased after intervention.The scatter diagram about ipsilateral Tm-GFR before the intervention and ipsilateral Tm-GFR increased percentage after the intervention showed that the two had a negative correlation($r=-0.6884, P<0.0001$). The receiver operating characteristic (ROC) curves about whether Tm-GFR improved or not showed that kidneys whose ipsilateral Tm-GFR<=25ml/min had a great improvement to the maximum extent.

Conclusions: ARAS patients with mild to moderate impaired renal function have a significantly improved blood pressure after interventional therapy,and the ipsilateral kidney whose Tm-GFR<=25ml/min has a significantly improved renal function after interventional therapy.

PP.42.35 OUTCOMES ON PERIPHERAL ARTERIAL DISEASE ON HAEMODIALYSIS. PROGNOSTIC VALUE OF ANKLE-BRACHIAL INDEX

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Objective: Haemodialysis patients have an increased risk of atherosclerotic disease and cardiovascular mortality. There is a strong relationship between chronic kidney disease (CKD) and peripheral arterial disease (PAD). The measurement of ankle-brachial index (ABI) identifies a high prevalence of subjects with asymptomatic PAD. The aim of the study was to analyze the evolution and mortality at one year in patients on haemodialysis according to the presence of PAD.

Design and method: All patients on haemodialysis were included. Patients with a diagnosis of PAD were excluded. ABI measurements were performed using a professional oscillometric BP monitor (Microlife WatchBP Office). The presence of PAD was defined as ABI<1. We take a basal measurement and a control one year later. Demographic and clinical data were recorded.

Results: From 46 patients in our haemodialysis program, 40 were included, 62.5 % men, mean age 68.57 ± 11.58 years. 24 of them (60%) had criteria of PAD: 66% PAD unilateral and 33% bilateral.
Patient´s characteristics: 63 % were hypertensive, 66.7 % diabetics, 61.9 % dyslipemics, 70 % smokers. Mean time on renal replacement therapy and on hemodialysis was:74 and 54 months respectively.
Mortality at one year on PAD group was 32 % vs 20 % in patients without PAD ($p = NS$) with an attributable risk of 12% and a relative risk reduction of 15%. Mortality was higher in patients with dual antiplatelet therapy respect to single antiplatelet therapy ($p = NS$). From 46 patients on haemodialysis in 2012, one year later: 16 were died, 1 had clinical PAD, and 2 were lost. Patients who survived (27) keep on and stable control of ABI at one year (medium basal ABI 0.56; control ABI one year later 0.44).

Conclusions: Haemodialysis patients with PAD have an increased mortality annually. Survival is linked to the stable maintenance of ABI. Mortality is higher in patients with dual antiplatelet therapy because of the sum of risk factors that indicate the treatment. We consider the evaluation of ABI in these patients is useful for early diagnosis of PAD and the establishment of strategies to help prevention and treatment.

PP.42.36 STATINS LOWER STENOSIS SEVERITY IN PATIENTS WITH ATHEROSCLEROTIC RENAL ARTERY STENOSIS

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Objective: Atherosclerotic renal artery stenosis (ARAS) patients may benefit from lipid-lowering medications but little is known about the effect on stenosis progression. We sought to examine the effects of medical therapy, including HMg-CoA reductase inhibitors (statins) and ACEI/ARBs on stenosis severity in patients with ARAS.

Design and method: Patients enrolled in CORAL had percent stenosis assessed by visual estimation of lesion angiography. The maximum percent stenosis for any renal artery within an enrolled subject was selected for analysis.

Results: Prior to randomization statins were used in 495 (66%) of patients and ACEI/ARBS were used in 419 (45%). There were 284 diabetics (34%). The overall average percent stenosis at randomization was $76\% \pm 11$. Percent stenosis was significantly lower in patients prescribed statins (75 ± 11 vs. 77 ± 11, $p = 0.042$) whereas ACEI/ARB use and diabetes did not influence percent stenosis.

Conclusions: Statin use, but not ACEI/ARB, is associated with less severe stenoses in patients with ARAS.

PP.42.37 ANGIOTENSIN INHIBITORS DECREASE ALBUMINURIA IN NON-DIABETIC PATIENTS WITH ATHEROSCLEROTIC RENAL-ARTERY STENOSIS

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Objective: Albuminuria is a marker for the progression of diabetic nephropathy as well as cardiovascular disease and mortality in both diabetics and non-diabetics. Albuminuria in diabetes is commonly treated with angiotensin inhibitors, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs), and treatment with statins may be indicated. Factors that are associated with albuminuria have not been previously examined in patients with atherosclerotic renal-artery stenosis (RAS).

Design and method: The Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL) clinical trial is a prospective, international, multi-center trial of patients with hypertension or chronic kidney disease and renal-artery stenosis (>60%). Urine albumin and creatinine were measured at a single core lab. Microalbuminuria was defined as an albumin creatinine ratio (UACR) ≥30 and ≤300 µg/mg and macroalbuminuria was defined as UACR >300 µg/mg.

Results: At baseline 463 (56%) had a normal UACR, 270 (33%) had microalbuminuria and 93 (11%) had macroalbuminuria. Diabetic patients had higher UACR (376 µg/mg vs. 123 µg/mg, p<0.001). Diabetic patients on an ACEI/ARB had lower UACR (296 µg/mg vs. 465 µg/mg, p=0.164) as did non-diabetics (62 µg/mg vs 176 µg/mg, p=0.009). Non-diabetic patients treated with ACEI/ARBs had a lower rate of microalbuminuria and macroalbuminuria (29.5% vs. 31.6% and 3.9% vs. 10.8%, respectively, p=0.011). In multiple linear regression analysis ACEI/ARBs were negatively associated with albuminuria (p=0.007), while patients with diabetes were positively associated with albuminuria (p<0.001). Statin use was not associated with albuminuria.

Conclusions: In patients with atherosclerotic renal-artery stenosis angiotensin inhibitors decrease albuminuria in both diabetics and non-diabetics, whereas statins do not.

PP.42.38 INTEREST OF SYSTEMATIC SCREENING OF MASKED HYPERTENSION IN PATIENTS WITH PERIPHERAL ARTERIAL DISEASE USING AMBULATORY BLOOD PRESSURE MONITORING

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Objective: Masked hypertension (MH) is defined by a normal office blood pressure (BP) and a high ambulatory BP. MH emerges as a critical public health concern due to its significant prevalence (10 to 25 %) and its poor cardiovascular prognosis.
The aim of this study is to evaluate the interest of a systematic MH screening, using twenty-four-hour ambulatory blood pressure monitoring (ABPM), among patients with peripheral arterial disease.

Design and method: Between June 2011 and August 2013, 54 patients with peripheral arterial disease who came in consultation or were hospitalized in the Vascular Medicine and Hypertension unit of the University Hospital of Lille, were included. They had a normal office BP (< 140/90 mmHg). An ABPM device was set on each patient. MH diagnosis was established if the BP average over 24 hours was higher than 130/80 mmHg, the daytime average higher than 135/85 mmHg or the night-time average higher than 120/70 mmHg.

Results: MH prevalence is about 42.6 % (23 patients). It is significantly more important in diabetic patients (64.7 % versus 32.4 % in non diabetic patients ; p = 0.026), in patients with known hypertension (58.1 % versus 21.7 % in patients without known hypertension ; p = 0.006) or with high-normal office BP (BP < 140/90 but systolic blood pressure > 130 mmHg or diastolic blood pressure > 85 mmHg) (64 % versus 24.1 % in case of strictly normal BP ; p = 0,003).

n = 54	Absence of masked Hypertension n = 31	Masked hypertension n = 23	p
Age (years/- DS)	62.7 +/-12	58.6 % +/- 9	0.241
Men (n ; %)	28 (90.3 %)	18 (78.2 %)	0.264
Tobacco (n ; %)	23 (74.2 %)	14 (60.9 %)	0.297
Dyslipemia (n ; %)	25 (80.6 %)	19 (82.6 %)	0.272
Diabetes mellitus (n ; %)	6 (19.5 %)	11 (47.8%)	***0.026***
Known Hypertension (n ; %)	13 (41.9 %)	18 (78.3 %)	***0.008***
Abdominal obesity (n ; %)	14 (45.2 %)	13 (56.5%)	0.407
Cardiovascular heredity (n ; %)	2 (6.5 %)	5 (21.7 %)	0.088
Sleep apnea syndrome (n ; %)	0 (0 %)	1 (4.3 %)	0.426
High-normal blood pressure (n ; %)	9 (29.0 %)	16 (69.5 %)	***0.003***

Conclusions: The high prevalence of MH in patients with peripheral arterial disease shows us the importance of a careful screening, specifically in diabetic patients, in patients with known hypertension or with a high-normal office BP.

POSTERS' SESSION

POSTERS' SESSION PS43

LIFESTYLE CHANGES

PP.43.01 CROATIAN REGISTRY ON AMBULATORY BLOOD PRESSURE MONITORING (HRKMAT). PRELIMINARY REPORT ON MEDICAL HISTORY AND LIFESTYLE CHARACTERISTICS OF STUDY POPULATION

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Objective: To analyse life style characteristics of the subjects included in the Croatian national registry on ambulatory blood pressure monitoring (ABPM).

Design and method: Out of 1637 hypertensive subjects included so far in the national registry, data on 1399 participants (men 55%; median age 59) were analysed. Family history on hypertension, cardiovascular diseases (CVD), diabetes, dyslipidaemia and renal disease was assessed. Data on subjects' comorbidities including TIA, stroke, coronary heart disease (CHD), heart failure (HF), peripheral arterial disease (PAD), chronic kidney disease (CKD), retinopathy, diabetes, glucose intolerance and dyslipidaemia were assessed. Patients reported their habits: smoking, alcohol and coffee consumption and physical activity. Office and ABPM were measured during normal working day.

Results: Family history was positive for hypertension in74.7%, for CVD in 55.7%, for diabetes in 34.7%, for dyslipidaemia in 31.7% and for renal disease in 13.9% of participants. Patients' comorbidities were TIA (5.9%), stroke (4.6%), CHD (15.3%), HF (4.8%), PAD (7.0%), CKD (14.9%), retinopathy (2.8%), diabetes (22.8%), glucose intolerance (9.2%) and dyslipidaemia (54.1%). There were 17% current smokers (82% smoking 1-10 cigarettes per day), 15% ex-smokers, while 66% never smoked. Drinking alcohol reported 12% of subjects, while 57% were consuming coffee (48% 1 cup/day, 37% 2cups/day, 15% three of more cups/day). Low level of physical activity admitted 43.8%, modest 42% and vigouros14.1% of participants.

Conclusions: According to our results hypertensive subjects have family burden of hypertension and other risk factors. Patients from our registry frequently have other comorbidities, dyslipidaemia, diabetes and CKD being most prevalent. We found surprisingly(and luckily) small number of smokers but high intake of coffee. Disturbingly high amount of participants are poorly physically active.

PP.43.02 FAILURE OF ACHIEVEMENT OF THE CHOLESTEROL GOAL BY HYPERTENSIVE PATIENTS

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Objective: Implementation of numerous guidelines remains a daunting goal for cardiologists. We assessed the hypothesis that the majority of treated hypertensives with elevated serum cholesterol levels, do not achieve the goals for Total Cholesterol (TC) and serum Low Density Lipoprotein Cholesterol (LDL-C).

Design and method: We conducted a cohort study with retrospective chart review, at the electronic medical record of our outpatient antihypertensive unit. Total of 210 treated hypertensive adults (aged=57±11 years, 55%=male), naive to previous lipid therapy with raised lipid levels and/or SCORE-risk>5% (using the low risk chart of the Fourth Joint Task Force), were included in the analysis from October 2007 to December 2008 (index time). Laboratory values of lipid panel were obtained right before and after the initiation of lipid pharmacotherapy, accompanied by verbal and written guidance for lifestyle modification.

Results: Mean monitoring duration time was 12 months. Average levels of TC and LDL-C were found 235 mg/dl and 170 mg/dl respectively. The majority of patients (92%) received monotherapy with HMG-CoA reductase (statin). Within index time, 46% (97/210) attained optimal combined cholesterol values. The remaining 54% (113/210) of the total population did not reach the cholesterol goal; among them 68% (77/113) was due to stringent target (established Cardio-Vascular Disease, Diabetes Mellitus, markedly increased lipid levels); another 20% (23/113) was due to inadequate therapy (low equipotency or low dose of statin) for the raised cholesterol values; an 8% (9/113) quit treatment for personal beliefs and 4% (5/113) were intolerant.

Conclusions: Achieving optimal cholesterol goals among hypertensives is amenable to both scientific analysis and clinical intervention but remains an odyssey. Renewed research and communication efforts must impart greater hope, confidence and increased access to treatment.

PP.43.03 LIFESTYLE RELATED CARDIOVASCULAR RISK FACTORS OF THE HYPERTENSIVE ROMA PATIENT. WHERE AND WHEN TO ACT. DATA FROM THE ROMA STUDY

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Objective: To evaluate lifestyle related cardiovascular (CV) risk factors in the hypertensive Roma population, information that further guides national strategies to improve health and outcome of this ethnic minority.

Design and method: 806 adult subjects (age range 18-82 years) from two Roma communities of Bucharest were included, between 2012 and 2013, regardless of medical history, and screened for major CV risk factors. Further, 271 subjects with hypertension (known and newly diagnosed) were studied (33.6%). We recorded: demographic and anthropometric data, level of education, living conditions, health related expenses, presence of major CV risk factors and blood pressure measurements with appropriately sized cuffs and asymptomatic target organ damage. Compliance to treatment and to diet recommendations were also noted along with associated conditions such as diabetes mellitus (known or newly diagnosed – glycaemia >126 mg/dl), hyperuricemia (>6 mg/dl in females; >6.8 mg/dl in males), dyslipidemia (LDL>115 mg/dl or total cholesterol>190 or triglycerides>150mg/dl). Visceral obesity was defined as waist circumference >102 cm in males and >88 cm in females.

Results: The prevalence of HTN was lower than that of the general population in Romania (33.6% vs 40.5% in the SEPHAR II Study, p<0.01). However, the Roma hypertensive patient displays a profile with an impressive CV burden. For other results see table.

Parameters	Females	Males	p (F vs M)	Total
Gender, No (%)	172(63.46)	99(36.53%)	<0.01	271(100%)
Average age ±SD (years)	56.18±11.32	55.26±10.07	ns	55.84±10.87
Level of education ±SD (no of years in school)	7.8±3.62	9.09±2.89	0.01	8.43±3.34
Living alone, widowed	26.74%	12.12%	<0.01	21.4%
Unemployed	48.83%	36.36%	0.04	44.28%
Not registered at a family physician	11.62%	22.22%	0.02	15.49%
Smoking, %	41.28%	54.55%	0.03	46.13%
Physical inactivity, %	76.74%	67.68%	ns	73.43%
High sodium intake, %	9.88%	14.14%	ns	11.44%
Visceral obesity, %	81.98%	52.53%	<0.01	71.22%
Obesity (BMI>30), %	60.47%	21.21%	<0.01	46.13%
Weight variations >5kg past year, %	60.47%	48.48%	ns	56.09%
Dyslipidemia, %	45.35%	44.44%	ns	45.02%
Hyperuricemia, %	29.07%	25.25%	ns	27.68%
Compliance to diet recommendation, %	15.69%	16.16%	ns	15.86%
Compliance to drug treatment, %	25.58%	25.25%	ns	25.46%

Conclusions: In a population with a very low level of education, poor access to medical services, women have a higher prevalence of modifiable CV risk factors. They are less educated and have a higher rate of unemployment. However, they are more likely to register for medical services, and there is a significant difference between widowhood between the two sexes. Roma hypertensive women are significantly much more affected by obesity. Compliance to diet recommendation is very low and only a quarter of these patients follow medical treatment on a daily basis.

PP.43.04 SIX YEARS SURVEY OF 24-HOUR SALT INTAKE ESTIMATED BY SPOT URINE IN THE JAPANESE GENERAL POPULATION

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Objective: Excess dietary salt intake is one of the major risk factor of hypertension. Moreover, accumulating evidence supports independent correlations between excess dietary salt intake and cardiovascular diseases including coronary artery disease and stroke. The present study was designed to investigate a comprehensive overview of salt intakes in the Japanese general population in order to provide basic information for public health to reduce salt intakes.

Design and method: A total of 43,566 participants (men=27,947, mean age=56.4 years), who visited our hospital for a yearly physical checkup from July 2008 to December 2013, were enrolled. Individual salt intake was estimated by calculating 24-hour urinary salt excretion using a method previously reported. Hypertension was defined as systolic blood pressure >=140mmHg, diastolic blood pressure >=90mmHg, or the use of antihypertensive medications.

Results: The mean salt intake was 11.0±3.4g/day in the year 2013 and was higher in men (12.4±3.2g/day) than in women (8.4±2.2g/day). These values were not changed during the past 6 years. Among all subjects, 13,654 subjects were defined as hypertension. During the past 6 years, the prevalence of hypertension was gradually increased (from 29.8% to 32.3%) and the ratio of hypertensive subjects under antihypertensive treatment to all hypertensive subjects was significantly increased (from 60.6% to 74.2%). In both men and women, estimated salt intakes were increased across the blood pressure categories (optimal, normal, high normal, and hypertension), but salt intakes were not different in hypertensive subjects with and without antihypertensive medication (13.1±3.5g/day and 13.1±3.1g/day, respectively, in men; 9.0±2.4g/day and 9.2±2.3g/day, respectively, in women). Only a small number of hypertensive subjects (overall 2.9%, men 0.6%, women 8.4%) achieved the target salt intake recommended by most guidelines for the management of hypertension (6 g/day).

Conclusions: Unfavourable high salt intakes in the Japanese general population were revealed, indicating that effort to reduce dietary salt consumption was not very successful in Japan during the past few years. The present results provide the basic information to reduce salt intakes and related cardiovascular mortality and morbidity.

PP.43.05 DECREASE OF BLOOD PRESSURE MAY BE ESSENTIAL FOR IMPROVEMENT OF VASCULAR DAMAGE IN MIDDLE-AGED HABITUAL SMOKERS

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Objective: Cigarette smoking is one of the major risk factors of cardiovascular disease. The serious risk may be attributable to premature or accelerated development of vascular endothelial damage and atherosclerosis caused by smoking. Among numerous toxic molecules included in cigarette smoke, nicotine is a major substance underlying the smoking addictions and directly affects cardiovascular system. The purpose of this study was to examine effects of instructions to stop smoking on the vascular endothelial function in subjects with habitual cigarette smoking.

Design and method: Middle-aged male habitual smokers (42±10 years, n=30) were enrolled and instructed to stop smoking. Clinical profiles and laboratory findings including serum levels of cotinine, a principal metabolite of nicotine, were investigated at baseline and 8 weeks after the instruction. Vascular endothelial function was assessed by investigating reactive hyperemia of small arteries using peripheral arterial tonometry (RH-PAT; End-PAT 2000) in the morning under an overnight fasting condition and was expressed as a RH-PAT index.

Results: At baseline, endothelial function expressed as a RH-PAT index was inversely correlated with serum levels of cotinine (r=-0.48, P<0.01), LDL cholesterol (r=-0.42, P<0.05), and chylomicron (r=-0.52, P<0.01). More than half of the smokers (n=17) could not completely attain smoking cessation and, thus, the RH-PAT index was not significantly improved 8 weeks after the instruction of smoking cessation. However, changes in the RH-PAT index showed a significant correlation with those in systolic blood pressure (r=-0.54, P<0.01). Moreover, the RH-PAT index was significantly increased in subjects who showed a decrease in systolic blood pressure (1.83±0.29 to 2.24±0.56, P<0.05).

Conclusions: Vascular endothelial function assessed by End-PAT 2000 was improved 8 weeks after the instruction of smoking cessation only in subjects who showed a blood pressure reduction during the study period. This suggests that a decrease in blood pressure is a key process to achieve an improvement of vascular endothelial function from smoking-related vascular damage.

PP.43.06 THE ASSOCIATION OF PHYSICAL ACTIVITY WITH THE STRUCTURE AND FUNCTION OF LEFT VENTRICLE IN A GENERAL POPULATION

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Objective: Physical activity (PA) is one of the major components of lifestyle therapy for patients with cardiovascular diseases as well as for the general population. Beneficial effects of physical activity on the cardiovascular systems is well documented but the precise mechanisms related to the hemodynamics or left ventricular (LV) structure or function in a population level are mixed.

Design and method: In the rural area, Yangpyung, Gyunggi Province in South Korea, for 1515 subjects, echocardiography, brachial ankle pulse wave velocity and questionnaire for physical activity were performed. Echocardiographic LV mass in gram/height², diastolic function parameters such as E, E/A, DT, IVRT were measured. Modified Stanford 7 day recall questionnaire to reflect the difference in the PA between field working seasons and the other seasons was applied to measure metabolic equivalent (METs) per day. In multiple regression model for LV mass index included age, sex, BMI, waist circumference, systolic blood pressure, pulse, total cholesterol, HDL, triglyceride, fasting blood glucose, antihypertensive medication (AHM), and eGFR. And for LV function, LV mass index was additionally added.

Results: The age was 60.6 +/- 10.1 years and female was 59.8% (n=906). Hypertension was observed in 43.1% (n=653). Subjects taking antihypertensive medication was 28.4% (n=431). In multiple regression analysis, for hypertension subjects, daily METs was positively associated with LV mass index (β=0.00096181, p=0.0572), E (β=0.00187, p=0.0085), E/A (β=0.00002087, 0.0492) and negatively associated with DT (β= -0.0033, p=0.0265), IVRT (β= -0.00165, p=0.004) and bapwv (β= -0.03788, p=0.003). There was no association with relative wall thickness. In normotensive subjects, daily METs had negatively associated with E (β= -0.00121, p=0.0527) and E/A (β= -0.00002307, 0.0198) and positively associated with RWT (β=0.296x10-5, p= 0.1306). Findings observed in hypertension subjects were also noted in the subjects taking AHM.

Conclusions: Even though physical activity have marginally positively associated with LV mass index, it might have beneficial effects on LV diastolic function and arterial stiffness without altering LV geometry, especially in hypertensive subjects regardless of antihypertensive medication status. Physical activity should be emphasized in all hypertension patients. For normotensive subjects, larger scale study is needed.

PP.43.07 EVALUATION OF HYPERTENSIVE PATIENTS INSIDE A BRAZILIAN DISEASE MANAGEMENT PROGRAM

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Objective: To analyse a group of hypertensive patients followed on a nurse-led disease management program from the beginning in this program through fifteen months of participation.

Design and method: Retrospective Cohort Study with quantitative approach of 283 hypertensive patients (73,4±10,9 years; 62,5% women) assisted in a disease management program conducted by telephonic contact with nurses between January 2011 to May 2012. The fifteen months follow up was segmented into five blocks of 3 months each. A comparison between the first quarter and the last quarter of participation was made with the following variables: Blood Pressure values, Body Mass Index, Sedentary, Use of Tobacco, Alcohol Intake and Medication Adherence measured by Morisky and Green survey. CI was 95% and the statistical significance level used was p<0,05.

Results: The association was statistical significance (p<0,05) between the comparisons in the first quarter versus the last quarter related to the following variables: Systolic Blood Pressure (128,8 vs 125,1 mmHg); Diastolic Blood Pressure (78,9 vs 77,2 mmHg) Sedentary (96,8% vs 71,7%); Medication Adherence (25,1% vs 85,5%) and Alcohol Intake (10,2% vs 3,2%). For the other variables Body Mass Index (27, 7 vs 27, 6 kg/m2) and Use of Tobacco (3,5% vs 5,7%) p>0,05.

Conclusions: The hypertensive patients assisted by the disease management program show that this kind of approach helps controlling the main associated factors for worsen the condition such as sedentary and alcohol intake while significantly increased the medication adherence which has a positive impact on their treatment.

PP.43.08 DEPRESSION AND LIFESTYLE RISK FACTORS IN NON DIABETIC HYPERTENSIVE PATIENTS

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Objective: To investigate association between psychosocial factor as depression and unhealthy lifestyle in non diabetic hypertensive patients (pts).

Design and method: In this study we include 184 hypertensives (92 men, 92 women), which underwent to physical examination and depression screening through Center for Epidemiologic Studies Depression (CES-D) scale. The lifeslyle risk factors also were analyzed: smoking, alcohol consumption, physical activity. Alcohol consumption was graded by frequency in 3 ranges: nondrinkers, 1-3 standard drinks a month, 1-6 standard drinks a week. The levels of physical activity during more than 40 minutes were divided in 4 categories: very seldom, less than once a week, 1-3 times a week, more than 3 times a week. Exclusion criteria were no prior evidence of coronary heart disease, diabetes mellitus and body mass index (BMI) >40 kg/m2.

Results: Mean age of hypertensive pts was 48.1±11.9 years, average office systolic/diastolic blood pressure (BP) were 140.8±20.1/89.3±12.6 mmHg,14% smokers. According the CES-D questionnaire all pts divided in two groups: 1 – 75 pts (41%) without depression (<15 points) and 2 – 109 pts (59%) with mild to major depression (>=15 points). The pts in the second group were significance older than pts in first group (50.7±11.7 vs 44.2±11.9 years,p<0.01) and the prevalence of depression was higher in women than in men (58.7% in 2 group vs 37.3% in 1 group,p<0.01). These groups did not differ by BP levels, BMI, alcohol consumption and level of physical activity. In the multiple regression analysis (F=8.79, p<0.01) of the relationship depression and clinical, lifestyle risk data in pts was found that independent factors of depression were age (β =0.21), grade of hypertension. (β=0.16), female gender (β=0.15) and waist circumference (β = -0.14).

Conclusions: This study demonstrated the high prevalence of depression in non diabetic hypertensive pts. The lifeslyle risk factors as smoking, alcohol consumption, physical activity were not associated with depressive symptoms in uncomplicated arterial hypertension. The findings revealed increasing depression with age, severity of hypertension and female gender what may confirm possible related pathogenetic mechanisms between depression and hypertension, what required early psychological intervention in hypertensive pts.

PP.43.09 PREDICTORS OF SPONTANEOUS BLOOD PRESSURE DECLINE IN STAGE 1 HYPERTENSION

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Objective: BP steadily increases with aging. However, lifestyle and environmental factors can modify the longitudinal BP tracking over the life. In the HARVEST study, 19.5% of the participants showed a BP decline to normal during a median follow-up of 16.5 years (Normotensives). The aim of this study was to identify the determinants and the predictors of the BP decline in these subjects.

Design and method: This investigation was conducted in 1019 subjects with initial stage 1 hypertension (mean of 6 readings) who remained untreated for at least 3 months and had complete follow-up data (mean age 339 years, 277 females). Patients were seen periodically and were given non-pharmacological recommendations. Antihypertensive treatment was started if they met the criteria for drug treatment (Hypertensives, n=820).

Results: Normotensives (n=199) were leaner (p=0.02), more physically active (0.02), drank less coffee (p=0.03), had lower triglycerides (p=0.04) and higher HDL-cholesterol (p=0.04) than Hypertensives. In the Normotensives, most of the BP decline occurred within the first year (from 14610/926 to 13811/878 mmHg). Thereafter, BP further declined to 1338/865 mmHg at follow-up end. The follow-up decline of heart rate was 610 bpm in Normotensives and 211 bpm in Hypertensives (p<0.001). White-coat hypertension at baseline was more common among Normotensives (32% versus 19%, p<0.001). However, in a sex-and-age-adjusted logistic regression both clinic BP decline after 3 months (p<0.001) and white-coat hypertension (<0.001) were predictive of future normotension. An improvement in lifestyle factors (p=0.001 for alcohol, p=0.04 for coffee), and a smaller yearly increase in body weight (p=0.002) were observed in Normotensives compared to Hypertensives. At follow-up end, prediabetes was less frequent in Normotensives than Hypertensives (17% versus 28%, p=0.002). None of the Normotensives developed cardiovascular events or atrial fibrillation (p<0.001 and p=0.07, respectively, versus Hypertensives).

Conclusions: In a substantial portion of young-to-middle-age stage 1 hypertensives antihypertensive treatment can be deferred because of a spontaneous long-lasting decline of clinic BP. This is more common in subjects with better metabolic profile who adopt healthier lifestyles. White-coat hypertension, an initial clinic BP drop, and a decrease in heart rate are predictors of this favourable outcome.

PP.43.10 SELF REPORTED PHYSICAL ACTIVITY IN HYPERTENSIVE PATIENTS AT THE MEDICAL OUT-PATIENT DEPARTMENT UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN-CITY, NIGERIA

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Objective: The importance of regular physical activity in the control of hypertension has been emphasized in various guidelines. This recommendation is usually suggested to the patients during routine clinic attendance. However in this setting, the different types of physical activities being undertaken at home are not well documented.
To assess the types of physical activity being undertaken by hypertensive patients attending the medical out-patient department of the University of Benin Teaching Hospital.

Design and method: This was a cross-sectional descriptive study utilising patients' self report of the different types of physical activities undertaken at home. A semi-structured researcher administered questionnaire was used. The demographics, types, frequency and duration of physical activity were documented. The blood pressure was also measured and good control were assessed in conformity with the 1999 WHO/ISH guidelines.

Results: A total of 509 patients were recruited into the study (age range of 22-97years; M:F- 1:2.2). Two hundred and fifty-nine patients (50.9%) volunteered they undertook some form of physical activity. This was mainly described as brisk-walking 179(69.1%), jogging 27(10.4%), workouts in gymnasium 13(5.1%), dancing 4(1.5), cycling 4(1.5%) and weight lifting 1(0.4%). Physical activities in a further thirty one (11.9%) patients related to home chores and farming. In most patients the frequency of exercise ranged from 2-3 times weekly to daily in 179 (69.1%) and once a week in 30(11.6%), and infrequently in 19(7.3%). The time reportedly spent in exercising ranged from 5 to 180 minutes. A total of 177(34.8%) patients had controlled blood pressure. There was a trend to a better control in those who partook in some physical activity (¬98 (55.4%), ¬vs 79 (44.6%)). This did not achieve statistical significance.

Conclusions: This study shows that just one half of the patients partook in some form of physical activity. There is need to engage hypertensive patients on the relevance of physical activity and encourage them to obtain the known benefits by optimizing their levels of physical activity.

PP.43.11 NUTRACEUTICALS FOR BLOOD PRESSURE AND SERUM LIPIDS CONTROL IN SUBJECTS WITH GRADE 1 HYPERTENSION

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Objective: As suggested in the 2013 ESH/ESC arterial hypertension guidelines the evidence favouring anti-hypertensive drug treatment in subjects with grade-1 hypertension is scant because no trial has specifically addressed this condition. In addition, the risk of potential side effects due to the anti-hypertensive agents whenever started could overcome the possible benefit of blood pressure (BP) improvement. Nutraceuticals - in light of their properties - are free from relevant side effects and could be a possible strategy for the treatment of these subjects. The aim of this study was to evaluate the efficacy of the nutraceuticals in lowering BP and improving lipid profile.

Design and method: Sixty-six patients with grade 1 essential hypertension (36 males and 30 females, mean age 56.0±4.6 years) without history of cardiovascular diseases and organ damage consecutively referred to our hypertension centre were analysed. The nutraceutical ARMOLIPID PLUS was started one tablet once-daily for 6 months. Clinic BP and 24-hours ambulatory BP monitoring (24h-ABPM) values and serum total cholesterol (TC), LDL-cholesterol (LDL-C), HDL-colesterol (HDL-C) and serum triglycerides (TG) were evaluated at baseline before treatment and at the end of the follow-up. Analysis of variance for repeated measures for BP and serum lipids values was provided.

Results: A significant reduction of mean 24h-systolic ABPM (141.6±6.4 vs. 136.2±4.8 mmHg $p<0.05$) and mean 24h-pulse pressure (52.6±7.2 vs. 47.3±5.4 mmHg) values compared with baseline was found. On the contrary, no reduction for clinic BP was observed. A significant (all $p<0.001$) improvement of the lipid profile was found and TC reduced by -19,2%, LDL-C by -17,4% and TG by -16,3%; HDL-C remained unchanged. No significant difference in BP reduction and in the improvement of lipid profile was found between genders.
Two patients dropped out from the study because of side effects (1 for a doubling in CPK levels and 1 for dyspepsia).

Conclusions: In grade-1 hypertensive subjects, nutraceuticals were safe and well tolerated and effective in reducing 24-hour BP levels and in improving lipid pattern. Randomised trials are needed to confirm and to answer any questions on these findings.

PP.43.12 LIFESTYLE AND CONTROL OF CARDIOVASCULAR RISK FACTORS IN ELDERLY OUTPATIENTS

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Objective: The relationship between lifestyle and cardiometabolic risk profile is well known in the adult population, whilst less information is available about the influence of patients' habits on the effects of treatment of cardiovascular risk factors (CVRFs) in the elderly. The present longitudinal intervention study aimed at investigating the interaction between lifestyle and pharmacological treatment in 406 patients (306 F) over 60 years of age, attending 2 public Outpatient Clinics of Naples for hypertension and metabolic abnormalities.

Design and method: Patients were followed-up by the same physician for a period up to 183 months (M±SD =23±35, median=6.1). Lifestyle was assessed by a structured questionnaire.

Results: A significant reduction in body weight, blood pressure, and glucose, cholesterol, and triglyceride levels was obtained. Smoking habit was present in 14% of women and 16% of men (χ^2 n.s.). Change in diastolic blood pressure (DBP) was greater in non-smokers as compared to smokers: -7±11 mmHg vs -4±11 mmHg, $p<0.004$. No between-group differences in changes of the other above-mentioned parameters were observed.
Thirty-six% of women and 71% of men drank small or moderate amounts of alcoholic beverages (χ^2 significance <0.001). Among women, drinkers showed an increase in serum uric acid during the follow-up (+0.55±1.3 mg/dL), unlike non-drinkers (-0.03±1.3 mg/dL, $p<0.05$). Conversely, SBP reduction was greater in alcohol-consumer men (-12±25 mmHg) than in non-consumers (-2±16 mmHg, $p<0.03$). Sedentary habit was evenly present in the 2 genders (45%F, 40%M, χ^2 n.s). Physically active patients showed a greater decrease in DBP (-8±11 mmHg) as compared to the sedentary ones (-5±11 mmHg, $p<0.02$). Total cholesterol was also reduced at a greater extent in active patients, but the difference attained the statistical significance in men only (-36±31 vs -5.5±47 mg/dL, $p<0.011$). The figure in the whole population was -30±40 vs -19±47 mg/dL, p=0.068.
Two separate multiple regression analyses showed the independent association of DBP changes with smoking habit and physical activity in models including baseline DBP and follow-up duration, but not age, gender, and education level.

Conclusions: These data show that a correct lifestyle strongly potentiates the efficacy of CV risk factor treatment in elderly outpatients.

PP.43.13 BLOOD PRESSURE CONTROL AND COST-EFFECTIVENESS OF SALT CONSUMPTION REDUCTION AND REGULAR PHYSICAL TRAINING IN PATIENTS AFTER BYPASS SURGERY

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Objective: The benefits salt consumption reduction and physical training have been identified. Clinical data of long-term cardiac rehabilitation program with salt consumption reduction and regular physical training and cost-effectiveness requires analysis.

Design and method: 200 patients (18% female, middle age – 57.7 years old,) undergoing bypass surgery (CABG) were included into 2-year rehabilitation program with cardiologist supervision, dietarian consultations, controlled exercise training (every 6 month) and self-controlled exercise training (daily morning exercise and walking with pulsimeter control). Patients were randomized in 2 groups: I group (46%) rehabilitation participants and II group – «standard-care».

Results: Mean systolic blood pressure was 30 mmHg lower in group I than II 24 month after CABG, p<0,01(130-128-121-115 mmHg in I group against 130-132-140-145 mmHg in II group 6, 12, 18, 24 month after CABG). Mean diastolic blood pressure was 16 mmHg lower in group I than II 24 month after CABG, p<0,05 (83-73-73-73 mmHg in group I against 86-89-90-89 mmHg in group II 6, 12, 18, 24 month after CABG). Target blood pressure was achieved 1,5-times fold much in I group patients, p<0,001 and mean myocardial mass index on echocardiography was 18,1 g/m2 was lower in I group patients by the end of 2nd year with no statistically significant difference 1 month after CABG. Mean average number of antihypertensive drugs was 1,5-times fold less in I group than into II, p<0,05. Thereat drugs therapy cost was 1,6-times fold less in 1st years (p=0,006) and 1,8-times fold (p=0,004) – in 2nd year in I group patient than II. Cost minimization in case of cardiac rehabilitation program participation was 1232,9 dollars per 1 persons for 2 years.

Conclusions: 2-years cardiac rehabilitation program with dietary consultation, salt consumption reduction and regular physical training in patients after CABG is a cost-effective, evidence based approach on improving systolic/diastolic blood pressure and myocardial mass index control, cost saving – 1,7-times fold reduced drug therapy cost for 2 years.

PP.43.14 ROLE OF NUTRACEUTICALS FOR THE TREATMENT OF HYPERCHOLESTEROLEMIA IN HYPERTENSIVE SUBJECTS AT LOW CARDIOVASCULAR RISK

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Objective: High serum cholesterol is a common risk factor in the Italian population and its active control is a crucial goal in order to implement an effective prevention of the cardiovascular events, particularly in subjects with high cardiovascular risk (CVR). On the contrary in subjects at low CVR the reduction of cholesterol levels by cholesterol-lowering drugs is not the recommended as first-line strategy and in these subjects ESC/EAS guidelines suggest - in addition to the change of lifestyle - the use of nutraceuticals and functional foods. The aim of this study was to evaluate the change in serum total cholesterol (TC), low-density lipoproteins cholesterol (LDL-C), triglycerides (TG) and high-density lipoproteins cholesterol (HDL-C) in hypertensive subjects which did not require the treatment with cholesterol-lowering drugs.

Design and method: In a group (A) of one-hundred two dyslipidemic hypertensive subjects (54 men and 48 women, mean age 52 ±2.8 years) serum blood lipids (in mg/dl) levels were assessed; TC was 230±24, TG 130±30, HDL-C 40 ± 5 and LDL-C 130 ± 10 respectively, without differences between genders. In these subjects ARMOLIPID PLUS one tablet daily, was started for 3 months and were compared with a other group (B) of dyslpidemic subjects age and sex matched which followed a diet program.

Results: In the group A, there was a significant reduction of TC (-24%), TG (-20%), LDL-C (- 23%) and an increase in HDL-C (+9%). In the group B, a smaller reduction of TC (-15%), TG (-12%), LDL-C (-10%) and in the increase of HDL-C (+4%) was observed.

Conclusions: In hypertensive subjects at low cardiovascular risk, nutraceuticals seems to be an effective approach in improving serum lipids pattern and in bridging the gap between the effectiveness of diet and the active treatment with cholesterol-lowering drugs.

PP.43.15 LOW RISK LIFESTYLE AND ARTERIAL STIFFNESS: THE HYPERTENSION-DIABETES DAEGU INITIATIVE STUDY

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Objective: Unhealthy lifestyle habits may contribute to arterial stiffness [brachial-ankle pulse wave velocity (baPWV)]. The aim of this study is to investigate the associations of smoking, drinking, physical activity, and diet with arterial stiffness.

Design and method: Study subjects were 1,474 Koreans in a rural area in Daegu city. They were enrolled from August to November 2008 for a cohort study. Of these subjects, 1,400 eligible subjects (519 men; mean age = 63.3 ± 10.6 years-old) were finally analyzed in this study. The baPWV was measured in the supine position after 5 min of bed rest using an automatic waveform analyzer (Colin VP-1000). A lifestyle score ranging from 0 to 4 was calculated using smoking status, drinking status, physical activity, and diet. A score of 1 awarded for each healthy behavior. Patients were divided into 4 groups according to a lifestyle score; 0 (n=207, 14.8%), 1 (n=291, 20.8%), 2 (n=519, 37.1%), and 3-4 (n=383, 27.4%).

Results: Of these subjects, only 73 (5.2%) satisfied all 4 healthy lifestyle criteria. The mean baPWV was significantly lower in subjects with higher lifestyle score (1707.4 ± 420.0cm/s versus 1675.9±418.1cm/s versus 1634.7±357.8cm/s versus 1571.9±331.0cm/s, p for trend <0.001). In analysis of covariance, subjects with a lifestyle score of 3-4 had a significantly lower mean baPWV compared to a subjects with a lifestyle score of 0, 1, and 2 after adjusting for conventional risk factors (model 1; p=0.048), inflammatory markers including high-sensitivity C-reactive protein and uric acid (model 2; p=0.046), and ankle-brachial index (model 3; p=0.035). In multivariate linear regression analysis, baPWV decreased by 0.104 cm/s (p = 0.005) in the subjects with 3 or 4 low-risk lifestyle habits compared to the subjects without low-risk lifestyle habits after adjusting for conventional risk factors, inflammatory markers including high-sensitivity C-reactive protein and uric acid, and ankle-brachial index.

Conclusions: Arterial stiffness is independently associated with lifestyle score in the general population. Our finding suggests that combination of healthy lifestyle such as regular exercise, healthy diet, smoking cessation, and drinking avoidance is modestly associated with lower arterial stiffness.

PP.43.16 CIRCADIAN AMBULATORY MONITORING OF TEMPERATURE, ACTIVITIES AND POSITION IN MENOPAUSAL WOMEN WITH OR WITHOUT HOT FLASHES

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Objective: Analyse differences if there exist in circadian rhythm of peripheral temperature, activity and position among menopausal women with more than three episodes of hot flashes per day compared to those that occur less frequently.

Design and method: An observational, descriptive study was carried out on 33 postmenopausal women aged 50 to 55 years divided into two groups: a) positive flashes hot flashes + (n = 17) menopausal women who present hot flash frequency 3 or > 3 flushes / day. B) negative flashes hot flashes - (n = 16) postmenopausal women without hot flashes or episodes that occur with a minor frequency to 3 hot flashes / day. Each woman included was studied for a week in which they were completing a sleep diary. Temperature rhythms wrist and motor activity were recorded simultaneously.

Results: Both the hot flashes group (-) and hot flashes (+) follow a similar pattern increasing the temperature about 1 ° C prior to initiating sleep and descending upon waking. In the group hot flashes (-) there is an increase flushing-temperature (0.2 ° C) compared to group (+) hot flashes coincides with lower nighttime awakenings group of hot flashes - (ns). Women belonging to the negative group conducted more hot flashes daydreams (nap) than patients positive flashes. The positive patients sleep hot flashes worse than negative flashes presenting more nighttime awakenings. A slight tendency for patients to flushing group + before bedtime is appreciated that the flushing-group patients (about 20-30 minutes). When comparing the two groups using t student (and flushing flushing + -) No statistical significance was obtained in any variable except temperature (p 0.03).

Conclusions: The presence of vasomotor episodes in menopausal women could not establish differences in the rates of temperature, activity and position among women with higher frequency of hot flashes and women with lower presence or absence of these. -The quality of sleep is worse in women with higher frequency of hot flashes.

PP.43.17 CONTINUATION OF THE MEDITERRANEAN DIET IN THE SPANISH ADULT POPULATION. THE DIMERICA STUDY

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Objective: The objective of this study was to evidence on the adherence to the Mediterranean diet in the Spanish adult population and its distribution by place of residence.

Design and method: This is a descriptive and transversal study assessed to Spanish residents over 20 years old. Individuals were included in a survey and stratified by age, gender and place of residence. All subjects were interviewed using a validated survey including socio-demographic characteristics, lifestyle habits, prevalence of cardiovascular risk factors and continuation of Mediterranean diet. For an interval of confidence of 95, cohort had to include a minimum of 1537 individuals.

Results: A total of 1810 subjects were enrolled (49.3% males). The survey pointed out that 2.1% have more than 6 pieces of fruit per day, 7.2% between 2-4 times, 30% 3-4 pieces, half of the population eat 1 -2 pieces and only 6.9% do not eat fruits at all. Concerning vegetables, 9.6% of the cohort consumes them more than twice daily, 29.3% and 45.2% twice or once, respectively, only 1.2% never eats vegetables. Regarding cooking patterns, 89.9% uses olive oil daily. Regarding cold meat products, 9.5% recognize eating it more than 5 times per week, 24.7% between 3-4 times, 36.1% 1-2 times, 19.5% only once and 10.2% do not eat it at all. Moderate red wine intake was observed since 71.3% do not drink red wine or less than one glass per week. The global score of continuation of Mediterranean diet was valuated 4,7 ± 1,7 points (0 points was considered non follow up, 10 points maximum follow up). A significant inverse correlation was found between the prevalence of arterial hypertension and the score of Mediterranean diet follow up (p< 0.05). Besides, a positive correlation was also showed between abdominal circumference and such score (p£ 0.05).

Conclusions: Consistent evidence suggests that the Mediterranean diet continuation is insufficient in our studied population. Furthermore, in some areas, the follow up is even lower. The promotion of the Mediterranean dietary pattern is an effective and feasible tool for the prevention of cardiovascular disease such as hypertension and obesity.

PP.43.18 SPANISH LIFESTYLES IN ADULT POPULATION. THE DIMERICA STUDY

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Objective: The focus of this research was to examine the lifestyle related to the cardiovascular risk in the Spanish adult population.

Design and method: This is a descriptive and transversal study assessed to Spanish residents over 20 years old. Individuals were included in a survey and stratified by age, gender and place of residence. All subjects were interviewed using a validated survey including socio-demographic characteristics, lifestyle habits, prevalence of cardiovascular risk factors and continuation of Mediterranean diet. For an interval of confidence of 95, cohort had to include a minimum of 1537 individuals.

Results: A total of 1810 subjects were included (49.3% males), mean anthropometric values were: weight 76.9 ± 5.4 Kg and body mass index 28.3 ± 4.2 Kg/m2. The analysis of dietary intakes pointed out that 44.8% prefer oily fish, 46.7% white fish and 8.4% dislike fish. From those, 33.9% have fish less than once per week. Only 5.4% consume red meat more than 4 times per week, 25% consume 3 or 4 times per week and 46.5% once or twice per week. Besides, 23.1% have red meat less than once per week. Concerning alcoholic drinks, 30% individuals consume them only once per week. Nearly a third of the population have vegetables more than 4 times per week (29.8%), another third 3 or 4 times

(32.5%) and 26.5% only have them once or twice per week. Finally, 7.9% consume vegetables only once per week and 3.5% do not eat them at all. Interestingly, 16.5% of the cohort was on a diet. 13.2% recognize eating functional food usually, whilst 8.7% eat them only time to time, 35.6% do not eat them at all and 42.2% have not heard about functional food.

Conclusions: Analysis of the data revealed that lifestyle habits of the Spanish population are far from cardiovascular healthy. It is recommended to include dietary changes of target population in order to reduce cardiovascular risk factors.

PP.43.19 CONSUMPTION OF POLYUNSATURATED FATTY ACIDS BY YOUNG HYPERTENSIVE PATIENTS

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Objective: To evaluate the frequency of polyunsaturated fatty acids (PUFA) consumption by young adults treated with primary arterial hypertension (H).

Design and method: The study group consisted of 100 subjects, 60 males and 40 females, aged 18 – 45 years, mean age 33,4 +/- 6,6 yrs, duration of H 5,0 +/- 4,5 yrs. The study tool was the self-administered questionnaire assessing consumption of 7 groups of products (frequency and intensity of intake) during the last month. The food products were divided for "healthy" and "unhealthy" ones. Moreover, data on education, place of living, BMI, BP, HR and current drug treatment were collected.

Results: BP at entry was 137.5/88.4 mmHg, in 71% BP was controlled, 47,5% had university education, 80% lived in cities, BMI was 26,9 +/- 5,2 kg/m2, but 25.0% of pts were obese. In the last month the pts more often ate saturated fatty acids than PUFA as well as 3-fold often ate "unhealthy" than "healthy" products ($p<0.01$). In the diet of patients, especially men, dominated meat products (pork, poultry, beef and sausages) or eggs and dairy products (yellow cheese, butter, cream, milk, mayonnaise). Fishes were consumed at least 1 time per week only by 8% responders. Vegetable oils (mainly rape and olive oil) were the main sources of PUFA, but its regular consumption reported only 21% of pts. Vegetables, being an alternative to fish and seafood source of PUFA, have been rarely eaten. Patients living in cities ate more often walnuts, almonds and cereals than those from rural areas. BP values, BMI, type and amounts of antihypertensive drugs were not associated with differences in pattern of consumption of examined food products.

Conclusions: Eating habits in majority of young hypertensive patients are not in accordance with recommendations of the prevention of cardiovascular diseases. In this population pro-healthy dietary education should be implemented and action for change of inappropriate dietary habits is needed.

PP.43.20 WORKLOADS OF THE PREVIOUS WEEK MODULATE BLOOD PRESSURE AND METABOLIC REACTIONS TO AN EVERYDAY`S MENTAL LOAD

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Objective: It is well known that stress of rats is more intensive after pre-stress wokloads which took place even 24 hours ago. Since stress responses to the same stressor differ considerably also in humans, we investigated, whether not only personal idiosyncrasies but also different wokloads as far back as several days, whose fatigue already has escaped awareness, may influence stress as a reaction to everyday`s mental load.

Design and method: 16 officer trainees of the Austrian Army had to wait for sampling of 100 microlitres of capillary blood from fingertip up to 40 minutes. Since waiting for this trivial but unavoidable event could mobilize metabolic responses and change blood pressure, we checked their pH, pCO2, HCO3, base excess, ionic calcium and magnesium, lactate, blood glucose (by a Nova Phox - device, Rödermark, Germany) and blood pressure values (first sampling). The same procedure was repeated 2 months later, when they had to absolve a 21 km run in the previous week (second sampling).

Results: First sampling: Waiting for blood sampling after routine employment during the preceding week led to waiting time dependent diminishment in systolic blood pressure and glucose, while calculated free fatty acids, pH and ionic magnesium increased linearly. pH correlated negatively with pCO2 but not with HCO3. Second sampling: After a demanding run of the previous week, systolic blood pressure diminished during the first 15 minutes of waiting but increased subsequently. Blood glucose and lactate increased with waiting time, pH correlated negatively with calculated free fatty acids and pCO2.

Conclusions: After a week of routine deployment, 40 minutes of waiting reduced expectational stress, visibly by a fall in systolic blood pressure and epinephrine induced blood glucose. pCO2 correlated inversely with pH, underlining successful overcompensation. Demanding deployment, however, made itself felt even one week later by correlative increase of lactate and blood glucose along with waiting time, pointing - together with a late increase in systolic blood pressure - towards increasing expectational stress.
Thus workload in the past which is no more consciously felt, does still increase sensitively to mental load even after a whole week.

PP.43.21 EFFECT OF DIETARY NITRATE ON AMBULATORY BLOOD PRESSURE IN TREATED HYPERTENSIVES

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Objective: The incidence of elevated blood pressure (BP) is increasing. Plasma/ nitrate/nitrite, which indicate nitric oxide (NO) bioavailability, have been shown to be lower in hypertensives compared to matched controls. Previous research has demonstrated that dietary nitrate can increase plasma nitrate/nitrite and decrease BP in acute and chronic settings in multiple populations, including normotensives, subjects with peripheral vascular disease and in treatment naïve hypertensives. The antihypertensive effect of dietary nitrate appears attributable to its in vivo reduction to nitrite and eventually NO. Dietary nitrate has not been evaluated among subjects established on anti-hypertensive therapy.

Design and method: On day 0, eligible subjects wore an ambulatory BP monitor for ~24 hours and blood was taken. Subjects then consumed concentrated beetroot juice (140ml), containing 14mmol nitrate for 14 consecutive days. On day 14 subjects consumed their last nitrate dose and again wore an ambulatory BP monitor for ~24 hours with a blood draw. Instruction not to alter activities which may affect nitric oxide kinetics was provided. Subjects were divided into 2 groups: baseline ABPM <140/90mmHg and baseline ABPM >140/90mmHg.

Results: We recruited 21 subjects on anti-hypertensive treatment. Table 1 displays baseline demographics and changes in BP variables following nitrate supplementation.

Table 1: Demographics and changes in BP variables following nitrate supplementation.

	baseline ABPM <140/90mmHg	and baseline ABPM >140/90mmHg
N=	17	4
BMI (kg/m^2)	30.2 (27-42)	33.5 (28-43)
Age (y)	56.8 (27-72)	48.5 (33-66)
Male (%)	15 (88)	4 (100)
Change in 24h SBP after 14d of nitrate supplementation (mmHg)	+0.4	+2.7
Change in % SBP dipping after 14d of nitrate supplementation	-0.1	+2.2
Change in 24h DBP after 14d of nitrate supplementation (mmHg)	0	00.25
Change in % DBP dipping after 14d of nitrate supplementation	-0.8	+3.89
Change in 24h MAP after 14d of nitrate supplementation (mmHg)	-0.1	+1.75
Change in % MAP dipping after 14d of nitrate supplementation	-0.6	+3.0

Conclusions: Our results do not support the existing data suggesting an anti-hypertensive effect of dietary nitrate. Possible explanations may include co-existing morbidities and long standing hypertension with use of multiple anti-hypertensive agents. Further work is required to evaluate this therapeutic concept.

PP.43.22 INCIDENCE OF DYSLIPIDEMIA AMONG PATIENTS WITH ISCHEMIC HEART DISEASE. A COMPARATIVE ANALYSIS BETWEEN INDIAN AND BULGARIAN PATIENTS

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Objective: The objective of this study is to analyse and compare the incidence of Dyslipidemia among patients with Ischemic heart disease in Bulgaria and India.

Design and method: Cross-sectional study among patients with established Coronary Artery Disease admitted in the Department of Cardiology. Method: Study was carried out in the Cardiology Department – Dr. Georgi Stranski Hospital, Pleven- Bulgaria and Department of Cardiology, Lourdes Heart Institute and Neuro Center (LHINC), Cochin, Kerala, India .Participants of this study were 496 patients who were admitted in the Cardiology Department, Lourdes Heart Institute and Neuro Center (LHINC), Cochin, Kerala, India between 1st June 2012 and 31st Dec 2012 and 476 patients who were admitted in the Cardiology Department, Dr. Georgi Stranski Hospital Pleven- Bulgaria between 1st of January 2012 and 31st Dec 2013 with acute coronary syndrome or coronary angiographic or Electrocardiography evidence of ischemic heart disease. Patients were analysed for incidence of Dyslipidemia based on the fasting lipid profile and treatment history for dyslipidemia. Data collected from the patients, old medical records, Clinical Examination and Laboratory results of the patients were analyzed for the study.

Results: From the study, it was seen that the incidence of dyslipidemia is 71% among Indian patients with Ischemic Heart Disease, and incidence of dyslipidemia is 82% among Bulgarian patients with ischemic heart disease ($p > 0.01$).

Conclusions: There is no statistically significant difference in the occurrence of dyslipidemia among patients with Ischemic Heart Disease in Indian and Bulgaria. Proper management of cholesterol and triglyceride levels is significant in both the population for the prevention of Ischemic Heart disease.

PP.43.23 COMPARISON OF EFFICACY OF INTENSIVE VERSUS MILD PITAVASTATIN THERAPY ON LIPID AND INFLAMMATION BIOMARKERS IN HYPERTENSIVE PATIENTS WITH DYSLIPIDEMIA

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Objective: Intensive as compared to mild statin therapy has been proven to be superior in improving cardiovascular outcome, whereas the effects of intensive statin therapy on inflammation and lipoprotein biomarkers are not well defined.

Design and method: This study assigned essential hypertensive patients with dyslipidemia to 6 months administration of mild (1 mg/day, n=34) or intensive pitavastatin therapy (4 mg/day, n=29), and various lipid and inflammation biomarkers were measured at baseline, and 3 and 6 months after the start of treatment.

Results: Both pitavastatin doses were well tolerated, and there were no serious treatment-related adverse events. After 6 months, significant improvements in total cholesterol, triglycerides, low-density lipoprotein (LDL-) cholesterol, LDL/high-density lipoprotein cholesterol (LDL/HDL), apolipoproteins B, C-II, and E, apolipoprotein-B/apolipoprotein-A-I (Apo B/Apo A-I), and malondialdehyde (MDA-) LDL were observed in both groups. Compared with the mild pitavastatin group, the intensive pitavastatin therapy showed significantly greater decreases in C reactive protein ($F=3.76$, $p < 0.05$), total cholesterol ($F=10.65$), LDL-cholesterol ($F=23.37$), LDL/HDL ($F=12.34$), apolipoproteins B ($F=19.07$) and E ($F=6.49$), Apo B/Apo A-I ($F=13.26$), and MDA-LDL ($F=5.76$) ($p < 0.01$, respectively).

Conclusions: Intensive pitavastatin therapy may have a more favorable effect not only in decreasing LDL-cholesterol but also in pleiotropic benefits in terms of improvement of apolipoproteins, inflammation, or oxidation.

PP.43.24 POLYUNSATURATED FATTY ACIDS REDUCE HDL CHOLESTEROL IN PRIMARY HYPERTENSIVE PATIENTS INDEPENDENTLY OF METABOLIC SYNDROME PRESENCE

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Objective: In this study we evaluated the association between fatty acid composition of red blood cell (RBC) membranes as a marker of fatty acids intake and the metabolic profile of hypertensive patients with and without metabolic syndrome (MS).

Design and method: Fifty patients (age 63±8 yr., M/F=24/26) with primary hypertension were divided in those with and without MS (36% and 64%, respectively) according to the 2003 AACE criteria. Fatty acid composition of RBC membranes, variables of glucose and lipid metabolism, and homeostasis model assessment (HOMA) as index of insulin resistance, were evaluated at baseline and after 6 months of a diet characterized by 3 times weekly fish meals supplementation. The diet was designed to increase the polyunsaturated to saturated fatty acid (PUFA/SFA) ratio in RBC membranes.

Results: At baseline hypertensive patients with MS had higher BMI, HOMA index, and triglycerides, glucose, insulin, and C-peptide levels, and lower HDL cholesterol, PUFA, PUFA/SFA ratio, and n-6 PUFA than patients without MS. Univariate analysis showed a strong and independent direct association between PUFA/SFA ratio in RBC membranes and HDL cholesterol levels ($r=0.606$, $P<0.001$). After 6 months of fish meals supplementation only 11 patients in both groups of patients, with and without MS, increased their PUFA/SFA ratio in RBC membranes (61% and 34%, respectively). The only predictor of such an increment was the lower baseline PUFA/SFA ratio (Odds Ratio 2.14e-20, 95% CI from 5.24e-40 to 0.87) in a model including also age, sex, and MS presence. HDL cholesterol increased in both groups of patients with and without MS (+12%, $P<0.050$ and +16%, $P<0.001$, respectively), whereas only patients with MS had an increment in insulin and C-peptide levels (+27% and +29%, respectively, both $P<0.05$).

Conclusions: HDL cholesterol is strongly and independently associated to the baseline PUFA/SFA ratio in RBC membranes and also with the PUFA/SFA ratio increment after fish meals supplementation. Although these findings suggest a positive effect of the PUFA/SFA ratio on HDL cholesterol independently of MS presence, the concomitant rise in insulin production in patients with MS could limit the overall beneficial effect of the intervention in these patients.

PP.43.25 SHORT AND LONG TERM OF A 3-MONTH KETOGENIC DIET ON CARDIOVASCULAR RISK PROFILE IN THE SETTING OF CLINICAL PRACTICE

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Objective: Ketogenic diets have been shown in the short-term to promote weight loss, and to improve some metabolic parameters of obese patients, in highly specialized obesity clinics. Our aim was to test the short and long-term effects of a 3-month ketogenic diet on the cardiovascular disease risk profile of overweight-obese patients in the setting of general practice.

Design and method: We consecutively recruited 377 subjects (M: 22%, W: 78%; mean age: 46±10 years, mean BMI: 31±3). They were instructed to follow a 3-month ketogenic diet, and then to gradually recover to a balanced diet with a follow-up visit at 6 and 12 months. Changes in studied parameters was evaluated by ANOVA for repeated measures.

Results: After three months, there was a significant improvement in body weight (-7,6±5,6 kg), BMI (-2,8±2,3 kg/m2), Waist circumference (-7,1±4,4 cm), Index of Central Obesity (-0.04±0.02), and % of fat (-3,8±3,8) (all, $p<0.01$), that further improved at 6 months ($p<0.05$), and then remained constant till 12 months. FPG (-8,7±15, 3 mg/dL), HbA1c (-0.2±0.7%), LDL-C (-19,4±31,2 mg/dL), TG (-23,4±61,2 mg/dL), gGT (-4,0±11,4 mg/dL) and SBP (-10,5±12,8 mmHg), DBP (-2,2±6,2 mmHg), PP (-8,4±12,6 mmHg) improved after 3 months and the stabilized till 12 months. HDL-C (+1,8±11,7 mg/dL), and SUA (-0,4±2,9 mg/dL) only improved after 6 months ($p<0.05$) and then stabilized till the end of the study. No significant change in renal parameters or electrolytes changes was observed beyond a mild by significant decrease in calcemia ($p<0.05$). The long term body weight loss was higher in those subjects experiencing a ketonuria in the first period of diet, and was directly related to the baseline body fat mass and inversely to the patient age.

Conclusions: A 3-month ketogenic diet safely improve a large number of anthropometric and cardiometabolic parameters in the setting of general practice and these effects seems to be maintained on the long-term after diet normalization.

PP.43.26 BERBERINE AND MONACOLIN EFFECTS ON WOMEN WITH OESTROPROGESTIN-INDUCED HYPERCHOLESTEROLEMIA

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Objective: One of the most frequent side effect of oral contraceptives use is a stable alteration of the lipid profile. This could be even more relevant in women affected by polycystic ovary syndrome (PCOS). Considering the importance of a balanced lipid profile in cardiovascular prevention and that the exposure to the drugs could be many years long, our aim was to investigate the possible beneficial effect of a largely tested low-dosed combined lipid-lowering nutraceutical on dyslipidemias induced by oestroprogestins prescribed to young women for different indications.

Design and method: We prospectively enrolled 84 patients in primary cardiovascular disease prevention, with low estimated cardiovascular disease risk (<5% according to the ESC/EAS guidelines), and LDL-C increased above normal value (LDL-C>130 mg/dL) after the use of at least two different oral oestroprogestins treatments. Forty-four women were prescribed oral oestroprogestins for PCOS, while 40 for pure contraception. The tested nutraceutical contained berberine 500 mg/tab and monacolins 3 mg/tab was prescribed to all enrolled patients, associated the previously prescribed standard lipid-lowering diet.

Results: After three months of nutraceutical treatment, we observed a significant improvement in BMI (-1.5±0.8%, p<0.001), FPG (-6.9±5.8%, p<0.001), HOMA index (-3.5±5.6%, p<0.001), TC (-20.1±6.6%, p<0.001), LDL-C (-25,3±8.9%, p<0.001), HDL-C (+14.1±2.2%, p<0.001), TG (-29.9±25.2%, p<0.001) and hsCRP (-2.5±2.4%, p= 0.019). Similar results have been obtained even repeating the analysis by subgroups, beyond hsCRP that significantly improved in PCOS patients compared to both the baseline and the non-PCOS group.

Conclusions: It appears that the tested combined lipid-lowering nutraceutical is able to equally improve lipid metabolism in oral contraceptive induced hypercholesterolemia in women affected or not by PCOS.

PP.43.27 CASE STUDY OF ESSENTIAL HYPERTENSION: EFFICACY OF AN ANTIPSORIATIC DIETARY APPROACH

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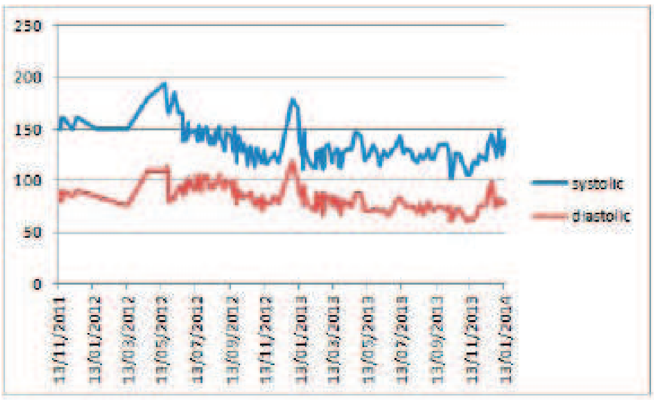
Objective: To observe the effect of an antipsoriatic-type personalized dietary intervention in hypertension.

Design and method: A personalized nutrition approach was developed, using the experience gained from decade-long observation of dietary effects on psoriasis and blood pressure (BP), which reflect the association of psoriasis and hypertension (cpcpsoriasis.blogspot.com; J Hypertension 2012; 30: e-suppl 1, poster 158; J Hypertension 2013, 31:433). Proposals to use this dietary intervention were approved by the UNTH ethics committee. Personalized dietary counseling was given to a 45 year old man with hypertension. (He declined antihypertensive medication for fear of adverse effects.) He monitored home BP using a wrist device (Microlife BP3BU1) and later an arm device (Omron M2). Data were analysed by linear regression using SPSS v17.

Results: In this ongoing live case study of essential hypertension, 168 readings over 2 years show a significant decline of BP with time (p<0.001), attainment of normal BP, and occasional relapse attributable to dietary indiscretion. It took about six months for the propositus to effectively apply the dietary advice (see figure).



Conclusions: These observations support the concept of an adverse diet-genome interaction in the aetiopathogenesis of chronic disease, and would warrant the conduct of randomized controlled trials of personalized dietary intervention to abate hypertension.

PP.43.28 INFLUENCE OF MONASTIC LIFE ON CARDIOVASCULAR HEALTH: THE MOUNT ATHOS EXPEDITION

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Objective: Mount Athos situated in Halkidiki peninsula in Northern Greece is an independent, exclusively intended to monastic life area, regrouping 20 Christian Orthodox monasteries, in which around 1000 male monks spend their life with prayer, meditation and work, complying with quite a peculiar life style, in terms of diet, pace of life (or circadian rhythm), spirituality and environmental stress. The aim of the present study was to evaluate metabolic parameters, 24h BP profiles, LV function and structure and arterial wall stiffness and thickness in a population of monks living in the biggest Mount Athos monastry (Vatopedi). In the present abstract we describe the methodology of this study and some preliminary results.

Design and method: This study was carried out between 15 and21 September 2013. 94 male monks living all in Vatopedi monastry were recruited. All measurements were performed on site. Monks gave their informed consent and have a complete physical exam, conventional and 24h ambulatory(A) BP measurements with validated oscillometric devices, standard blood tests under fasting conditions, EKG, measurements of AGEs deposits on skin, LV echography, carotid artery echography and carotid-femoral pulse wave velocity (PWV). They all answered detailed questionnaires about their diet, activities in the monastry, sleep duration and demography.

Results: Studied monks had a mean age of 42.0±13.0 years (mean±SD) and had been living in Mount Athos for an average period of 14.6 years. Mean BMI was 26.2±5.2 kg/m2 and waist circumference was 90.8±13.2 cm. Casual SBP and DBP were 117.5±15.7 and 73.7±10.6 mmHg respectively, whereas HR was 71.1±9.6 bpm. Total cholesterol was 190±46 mg/dL and glycaemia was 82.5±32.7 mg/dL. LV parameters, aortic stiffness (PWV) and carotid parameters and ABPM data are still being analyzed.

Conclusions: The obtained results in a sample of 94 monks living for several years in strict monastic conditions, provide the possibility to assess the influence of a very particular environment on metabolic and cardiovascular profiles. These results will be compared with those of age-matched males living in the region.

POSTERS' SESSION

POSTERS' SESSION PS44
ATHEROSCLEROSIS

PP.44.01 OXIDIZED LOW DENSITY LIPOPROTEIN STIMULATES PROLIFERATION AND MIGRATION OF HUMAN AORTIC VASCULAR SMOOTH MUSCLE CELLS VIA UP-REGULATION OF PRORENIN RECEPTOR

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Objective: Prorenin receptor (PRR), as a new member of renin-angiotensin-aldosterone system (RAAS) plays a critical role in cardiac fibrosis and albuminuria in diabetic angiotensin II type-1-receptor-deficient mice. Oxidized low density lipoprotein (ox-LDL) as a key risk factor of atherosclerosis initiation and progression has been observed to activate RAAS system. However the relevance of ox-LDL and human aortic smooth muscle cells (HASMCS) function switching still remains unclear. In this research, we clarified the role of PRR on proliferation and migration of HASMCs stimulated by ox-LDL.

Design and method: The existence of PRR on HASMCs was identified by immunofluorescence stain. The expression of PRR and the corresponding phosphorylation of P38MAPK were assessed by western blot. The roles of PRR in proliferation and migration of HASMCs were figured out by blocking it with siRNA. SB203580, the inhibitor of P38, was added to explore the effects of P38 signal transduction. The proliferation and migration of HASMCs were estimated by WST-8 assay and Boyden chamber chemotaxis assay respectively.

Results: Our results showed that PRR was expressed in cultured HASMCs. Ox-LDL increased the PRR expression in a dose and time dependent manner. Then the up-regulation of PRR activated the phosphorylation of P38 protein, since knock down of PRR completely blocked it. Ox-LDL induced the proliferation and migration of HASMCs. Knock down of PRR, dramatically inhibited both of these effects. SB203580 reduced the proliferation stimulated by ox-LDL, which showed no significant difference from that of blocking the PRR directly. But the decrease of HASMCs migration in the presence of SB203580 was much less than the suppression of PRR.

Conclusions: As a member of the complicated MAPK signal transduction network, P38 may not be the only pathway connecting PRR and HASMCs activated by ox-LDL. Ox-LDL may also activate other receptors like LOX-1 or angiotensin II receptor(type 1) to mediate HASMCs proliferation. And the PRR activation can activate multiple signal transduction pathways as well. Taken together, ox-LDL can activate P38 signal transduction pathway mediated by PRR, then increase the proliferation and migration of HASMCs.

PP.44.02 THE ASSOCIATION BETWEEN CORONARY CALCIFICATION AND ADENOMATOUS POLYP OF COLON IN KOREAN ADULTS

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Objective: Adenomatous polyp of colon is a precancerous lesion and screening for colon polyp has been shown to reduce colorectal cancer mortality. Many studies have shown that the adenomatous polyp of colon and cardiovascular disease share common risk factors. Coronary calcification is closely related with mural atheromatous plaque and proportionally associated with the severity of atherosclerotic disease. However, little has been written about the relationship between coronary calcification and atheromatous polyp. We sought to investigate whether coronary calcification is associated with the adenomatous polyp of colon.

Design and method: Among 2045 adults who were examined in health check-up center in Gangnam Severance hospital, we examined the association between coronary calcium score (CCS) as a measurement of coronary calcification by multi-detected row computed tomography (MDCT) and the presence of adenomatous polyp of colon as determined by colonoscopy. CCS values were categorized separately as follows: 0, 1-17, 18-105, and >=106. The odds ratios (ORs) and 95% confidence intervals (CIs) for adenomatous polyp of colon were calculated across each group of CCS score.

Results: The prevalence of adenomatous polyp of colon was increased according to high coronary calcium score groups with statistical significance ($p<0.001$). After adjusting for confounding variables, the adjusted ORs (95% CIs) for adenomatous polyp of colon according to each of the four groups of CCS were 1.00 (reference), 1.46 (0.92-2.32), 1.89 (1.17-2.99), and 3.57 (2.24-5.69).

Conclusions: A higher level of CCS was found to be independently and strongly associated with the presence of adenomatous polyp of colon, regardless of traditional cardiovascular risk factors. This finding suggests that people who have high risk for coronary atherosclerosis should be considered for further evaluation of adenomatous polyps of colon.

PP.44.03 AN EXAMINATION ABOUT EVALUATION OF BLOOD PRESSURE AND PULSE WAVE VELOCITY IN YOUNG HEALTHY PEOPLE

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Objective: Pulse Wave Velocity (PWV) was an examination to measure the level of atherosclerosis in many hospitals in recent years. Previous report showed that Risk factor of atherosclerosis as hypertension, diabetes mellitus, hyperlipidemia, aging, smoking regulates the PWV fast.
On the other hand, PWV in young people were correlative with obese and hyperlipidemia in previous report, but correlation PWV with other risk factors were not elucidated. Here, we paid attention to the relationship between PWV and Familial History (FH) and Blood Pressure (BP) in Healthy, non-smoking youths without abnormal data of blood test in medical examination (blood sugar, lipid, liver and renal function) in this study.

Design and method: Non-smoking healthy young people, 72 men and 30 women, without abnormal data of blood test in medical examination was entry in this study. Medical examination by interview was done to all of them. If he or she had a familial history of hypertension, diabetes mellitus, hyperlipidemia, ischemic heart disease, cerebrovascular disease in father or mother, it counted as two point, and also in grandfather or grandmother, as one point by each risk factor. And in this study, called three former risk factors as "disease risk (DR)", two latter risk factors as "outbreak risk (OR)".

Results: Mean PWV was 1191.5cm/s in men, 1119.5 cm/s in women. Next we sort these data into ascending-order, and divided into "low PWV (LP)" and "high PWV (HP)"bound on the median. Men recorded LP 1088.0cm/s vs HP 1298.0cm/s, women recorded LP 1004.5cm/s vs HP 1234.5cm/s. ($P<0.05$, Both LP and HP) DR of men in LP 0.40 vs HP 1.32, women in LP 0.44 vs HP 1.56. ($P<0.05$, Both LP and HP).
In BP, Men recorded LP 117.9/65.7mmHg vs HP 125.6/71.5mmHg, women recorded LP 106.0/62.2mmHg vs HP 111.2/65/9mmHg. ($P<0.1$, Both LP and HP).

Conclusions: In this study, we conclude that familial history and BP may correlate with PWV in young healthy people especially in HP. These result was appropriate because of the median of PWV was equal the previous data of healthy people.

PP.44.04 REDUCTION OF BLOOD PRESSURE IN PATIENTS UNDERGOING STATIN THERAPY

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Objective: Unregulated blood pressure is an adverse prognostic factor in patients, especially when combined with dyslipidemia. Inhibitors of 3OH-3methyl-glutaryl-coenzyme A reductase reduce the risk of cardiovascular events and death in both primary and secondary prevention of cardiovascular disease.

Although the long-term benefit by statin treatment is largely attributed to their cholesterol-lowering action, increasing attention focuses on additional actions called pleiotropic effects. The present study examines the correlation between blood pressure and statin therapy.

Design and method: We included 40 patients with first-diagnosed dyslipidemia (36 male, 4 female, mean age 42±8). Before statin therapy (atorvastatin 20 mg), fasting blood tests were performed (mean cholesterol 240 ±50 mg/dl, mean LDL- C 164±30 mg/dl, HDL38±13, triglycerides 180±40 mg/dl, glucose 90 ± 20 mg/dl).Also, arterial pressure was recorded (mean systolic arterial pressure 140±10 mmHg, mean diastolic pressure 80±10 mmHg). After 6 months of therapy, we repeated blood essays and arterial pressure measurement. Statistical analyses were performed using SPSS software. (Version 17). P < 0.05 was considered statistically significant.

Results: A significant correlation was found between statin therapy and systolic arterial pressure (p value 0.002).The patients presented a decrease in total serum cholesterol and LDL cholesterol, while there was an increase in HDL cholesterol. Simultaneously, we observed a decrease in blood pressure (systolic blood pressure by 2 mmHg) while diastolic arterial pressure did not affected.

Conclusions: Statin therapy is associated with reduced systolic arterial blood pressure. Our study, emphasizes the pleiotropic effect of statin therapy. Apart from the known effects of statins, on lipid profile and markers of subclinical atherosclerosis, it seems to affect positively on the reduction/stabilization of blood pressure to normal levels, due to anti-atherosclerosis result.

PP.44.05 VITAMIN D IS ASSOCIATED WITH CAROTID INTIMA-MEDIA THICKNESS BUT NOT WITH THE PREVALENCE OF CAROTID ATHEROSCLEROTIC PLAQUE IN GENERAL POPULATION

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Objective: Evidence suggests low vitamin D concentration may increase risk for cardiovascular disease. However, little is known about the association between vitamin D and atherosclerosis. We aimed to analyze the relation between carotid atherosclerosis or intima-media thickness and serum vitamin D in the sample of general population.

Design and method: The study group comprised of 175 subjects recruited from general population. SpaceLabs 90207 oscillometric monitors were programmed to measure ambulatory blood pressure (BP) each 15 min. daytime (6.00 - 22.00) and each 30 min. nighttime. Common carotid artery intima-media thickness (IMT) was measured at both sides with B-mode ultrasound (VIVID7, GE, Norway). Vitamin D (25(OH)D) concentration was measured in serum. Database management and statistical analyses were performed with SAS software (SAS Institute, Cary, NC), version 9.3.

Results: The study group included 77 men and 98 women, mean age = 48.5±14.8 years, 110 subjects had hypertension. Average serum vitamin D level was 19.7±8.0 ng/ml. Based on carotid ultrasound, 51 participants were diagnosed as having atherosclerotic plaque. On multivariate analyses, with adjustment applied for age, sex, body mass index, 24-hour systolic BP, smoking and serum total cholesterol, we did not observe any differences in vitamin D level between subjects with and without carotid atherosclerosis (20.4±9.4 vs 19.5±7.4 ng/ml, p=0.55). In subjects without carotid atherosclerosis, carotid IMT increased with decreasing concentration of 25(OH)D, increment 2.0 µm per 10 ng/ml lower 25(OH)D, p=0.048. We did not observe such association in the subgroup with carotid atherosclerosis and in the total study population.

Conclusions: These findings from a population-based cohort suggest a potential role for vitamin D in carotid remodeling. We did not observe any association between vitamin D and prevalence of carotid atherosclerotic plaque, however additional research is needed to determine whether vitamin D may influence the progression to carotid atherosclerosis.

PP.44.06 THE IMPLICATION OF CIGARETTE SMOKING AND SMOKING CESSATION ON MACROPHAGE CHOLESTEROL EFFLUX IN CORONARY ARTERY DISEASE PATIENTS

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Objective: We investigated the ABCA1 and ABCG1 expression and function in mediating cholesterol efflux from macrophages of cigarette smoking patients with coronary artery disease before and after smoking abstinence.

Design and method: This is a randomized, prospective and parallel controlled study. All the subjects, including 17 healthy non-smokers, 35 healthy chronic smokers and 32 CAD smokers, were recruited in Peking Union Medical College Hospital (PUMCH) (Beijing, China). Smoking subjects were randomly assigned in a 1:1 ratio to either smoking cessation subgroup or continued smoking subgroup. Smokers randomized into smoking cessation subgroup were asked to stop smoking for at least 90 days. There were 14 healthy smokers and 13 CAD smokers finished 90 days smoking cessation. Blood samples were collected from all subjects. Peripheral blood monocyte cells were differentiated into macrophages, real time PCR and immunoblots were performed and cellular cholesterol efflux were tested to evaluate ABCA1 and ABCG1 expression and function in macrophages from subjects.

Results: We found that ABCA1 expression, as well as its function in mediating cholesterol efflux to apoA-1, was decreased in macrophages from both healthy and CAD smokers compared with those from non-smokers at baseline. There was no obvious difference in ABCG1 expression among the three study groups. Both HDL-cholesterol and apoA-1 levels were substantially lower in plasma from smoking subjects compared with that in non-smokers. ABCA1 expression and its function in mediating cholesterol efflux were reversed by 3 months smoking cessation in CAD group. ABCA1 function appeared an improved tendency in healthy smoking cessation group. ABCG1 expression did not change after smoking cessation in each group. ABCA1 mRNA and protein expression were inhibited by tar rather than nicotine and carbon monoxide by inhibition of Liver X receptors.

Conclusions: Chronic cigarette smoking impaired ABCA1 protein expression and its function in mediating cholesterol efflux in macrophages. ABCA1 expression as well as its function could be reversed by tobacco abstinence in CAD patients. Inhibition of ABCA1 expression was due to tar rather than nicotine or carbon monoxide in tobacco.

PP.44.07 IDENTIFICATION OF FACTORS THAT INFLUENCE ARTERIAL STIFFNESS IN SUBJECTS WITH METABOLIC SYNDROME

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Objective: Knowing the predictive value of pulse wave velocity for cardiovascular events, it is extremely important to identify the factors responsible for the increase in arterial stiffness.
Objective Identification of factors that influence arterial stiffness, i.e. pulse wave velocity (PWVAo) and the augmentation index (AixAo), in subjects with metabolic syndrome (MetS).

Design and method: The study included 150 subjects with metabolic syndrome, diagnosed based on IDF criteria, with a mean age of 60.40±9.47 years. All patients underwent anthropometric measurements, biochemical and arterial determinations. Arterial parameters were determined using the TensioMedTMArteriograph.

Results: A significant correlation was found between pulse wave velocity and age (r= 0.252,p<0.001) , systolic blood pressure (r=0.344, p<0.001), diastolic blood pressure (r=0.148, p=0.032) and triglycerides (r=0.206, p=0.003). On the other side, AixAo significantly correlated with age (r= 0.345), weight (r = - 0.432), body mass index (r = - 0.318), abdominal circumference (r = - 0.346) systolic and diastolic blood pressure(r = 0.353, respectively r = 0.221), total cholesterol (r = 0.150) and HDL cholesterol (r = 0.305).
Of all parameters considered (age, BMI, abdominal circumference, systolic blood pressure, diastolic blood pressure, glycemia, total cholesterol, LDL-cholesterol, HDL-cholesterol, triglycerides), the most important determinant of pulse wave velocity is systolic blood pressure. In multivariate analysis, systolic blood pressure (determination coefficient: 3.586, p<0.0001), serum triglycerides (determination coefficient: 3.579, p<0.0001) and age (determination coefficient: 3.510, p=0.001) are independent predictive factors for pulse wave velocity.

Conclusions: Despite the fact that both pulse wave velocity and augmentation index represents arterial stiffness parameters, seems to be influenced in a different manner by anthropometric and biochemical parameters.

PP.44.08 THE IMPACT OF ARTERIAL STIFFNESS ON THE PERFORMANCE OF PERCUTANEOUS CORONARY INTERVENTION DURING ACUTE CORONARY SYNDROME

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Objective: Increased arterial stiffness is an accepted cardiovascular risk factor. However, the effect of arterial stiffness on the performance of percutaneous coronary intervention (PCI) during acute coronary syndrome (ACS) is not well known. The aim of this study was to evaluate the impact of arterial stiffness measured by pulse wave velocity (PWV) on acute gain and late loss after PCI during ACS.

Design and method: Data from 253 consecutive patients (342 lesions) who underwent PCI using drug eluting stents due to ACS and PWV study were analysed.

Results: Before Procedure, the minimal lumen diameter (MLD) was 0.82 ± 0.49 mm. In addition, those of post-procedure & 10-month follow-up were 2.34 ± 0.40 mm and 2.00 ± 0.65 mm, respectively. Mean PWV, acute gain and late loss were 1683 ± 386 cm s(-1), 1.52 ± 0.54 mm and 0.15± 0.54mm. There was negative relation between PWV and acute gain (correlation coefficient = -0.161 ; p=0.029). However, there was no relation between PWV and late loss (correlation coefficient = -0.032 ; p=0.666) In addition, acute gain was smaller in hypertensive patients than normotensive patients. (1.46 ± 0.51 mm vs. 1.67 ± 0.59 mm ; p=0.012).

Conclusions: Increased arterial stiffness is unfavourable for acute gain of the patients undergoing PCI during ACS. However, this is not prognostic factor for late loss. Therefore, we should make more effort to get sufficient acute gain when faced with the patients of ACS who show high PWV, which means increased arterial stiffness. Moreover, hypertensive patients are more likely to get less acute gain during ACS.

PP.44.09 LEPTIN/ADIPONECTIN RATIO AND RELATION WITH LIPIDOGRAM IN OVERWEIGHT, HYPERTENSIVE PATIENTS WITH CARDIOVASCULAR EVENT

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Objective: According to recent studies, leptin/adiponectin ratio presents better marker of atherosclerosis, insulin resistance, metabolic syndrome and cardiovascular event than leptin and adiponectin concentrations alone. Most of the studies were done in obese individuals. This study analyses relationship between leptin/adiponectin ratio in the early stages of increasing body fat, in overweight with developed metabolic syndrome and myocardial infarction in personal history. The aim of the study was to determine the relationship of cardiovascular risk factors with leptin/adiponectin ratio, to determine role of serum lipid levels in relation with leptin/adiponectin ratio but in overweight individuals.

Design and method: Study included 80 patients (40 male, 40 female), body mass index 25-30 kg/m2, visceral type of obesity, dyslipidemia, hypertension and myocardial infarction in the personal history. Exclusive criteria were obesity, diabetes mellitus and renal disease. Anthropometric, biochemical and cardiovascular measurements were done to all individuals. Serum leptin concentration was measured with radioimmunoassay test and total adiponectin level with enzyme immunoassay test.

Results: Leptin/adiponectin ratio is significantly lower in male group than in female group of subjects. Levels of cholesterol , triglycerides, LDL were higher and HDL was lower in male group according to reference values. Cholesterol and LDL were higher but triglycerides and HDL were in regular range in female group. The ratio of leptin/adiponectin showed no significant correlation in the male and female group of examiners with the level of cholesterol, triglycerides, LDL and HDL.

Conclusions: In overweight persons (with central type of obesity, increased leptin level, decreased adiponectin level, hypertension, coronary disease but without diabetes mellitus) leptin/adiponectin ratio in relation with lipidogram concentrations showed that dyslipidemia is not main part of complex atherosclerotic pathophysiology. Dyslipidemia is present in overweight with metabolic syndrome, but the other risk factors in these patients could be more important, such as hypertension. Also, it is important to emphasize gender differences in adipokine levels and ratio, which may be important in the pathophysiology of metabolic processes that affect individual to each risk factor.

PP.44.10 RELATIONSHIP AMONG AMBULATORY ARTERIAL STIFFNESS INDEX, AUGMENTATION INDEX AND PULSE WAVE VELOCITY IN PATIENTS WITH HYPERTENSION

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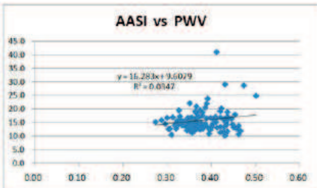
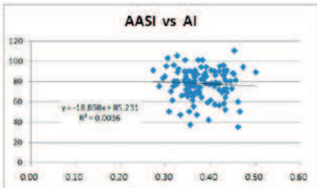
Objective: Ambulatory arterial stiffness index (AASI) , the slope of diastolic on systolic pressure from 24-hour ambulatory recordings, is known to reflect not only vascular stiffness but also autonomic dysfunction.

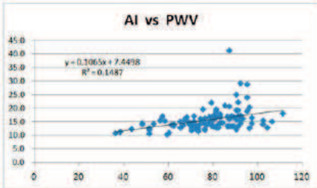
Design and method: We collected the data of hypertensive patients who took the test of ambulatory blood pressure monitoring, augmentation index(AI) and pulse wave velocity (PWV) measurement. We examined the association among them.

Results: The data of total 111 patients (male 64.8%, mean age 47.1±15.4 years) were collected. AASI had significant correlation with AI (R2=0.003, p=0.015) and PWV (R2=0.035, p=0.038). AASI did not correlated with standard deviation of mean BP, a parameter of BP variability. AI correlated well PWV (R2=0.1487).

Conclusions: The result of this study shows that AASI correlate AI and PWV, surrogate marker of arterial stiffness but not mean BP variability.







PP.44.11 RELEVANCE OF SUBCLINICAL ATHEROESCLEROSIS IN PRIMARY PREVENTION CARDIOVASCULAR RISK STRATIFICATION

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Objective:
1ºAnalize the proportion of patient that due to subclinical atherosclerosis in their carotid ultrasound change their risk category according to NCEP-ATPIII.
2ºAnalyze the proportion of patients that reach LDL goal levels according to NCEP ATPIII.
3ºAnalyze if there are differences in insulin resistance in the different NCEP ATP III risk categories.

Design and method: We have studied systematically 1164 consecutive subjects that have consulted for the first to our cardiovascular prevention unit. We have selected 850/1164 (73%) subjects undergoing primary prevention assessment that have completed their clinical, laboratory and carotid ultrasound (CUS) evaluation. We have excluded patients with history of diabetes and/or coronary artery disease and/or peripheral vascular disease. Subclinical atherosclerosis was defined as one or more plaques detected by carotid ultrasound using ARIC criteria. Insulin Resistance (IR) was determined by HOMA with 2,5 as cut off value (With IR >2,5). Two risk subgroups were analysed: 1) Low risk (0-1 risk factors or >2 risk factors with 10 year Framingham risk < 10%) and, 2) Moderate risk (>2 risk factors with 10 year Framingham risk > 10%)

Results: The proportion of patients that changed their risk category after carotid artery plaque assessment for each risk category is shown in the table 1 on the following page.
The Odds Ratio of subclinical atherosclerosis in the moderate risk group was 2.8 (95% CI: 1.9-4.2). The proportion of patients reaching the different levels of LDL goal and insulin resistance are detailed in the table 2.

Table 1:

	Low Risk n: 713	Moderate Risk n:137	P Value
Change in Risk Category due to CUS Plaque assessment	18% (95% CI: 15-21%)	38% (95%CI: 30-46%)	P < 0,001

Table 2:

	Low Risk n: 713; 100% (95%CI)	Moderate Risk n:137; 100% (95%CI)	P Value
LDL at goal*	71% (68-75%)	39 (32-48%)	P< 0.001
LDL < 100mg/dl	20% (17-23%)	15% (10-21%)	P NS
IR HOMA (≥2,5)	30% (26-33%)	54% (45-62%)	P< 0.001

*LDL at goal: <160mg/dl in patients with 0-1 risk factors and <130 mg/dl in patients with ≥2 risk factors

Conclusions: With Carotid US assessment 4/10 in the moderate risk subgroup and 2/10 in the low risk subgroup changed their risk category. With this new categorization only 1-2/10 patients reached the LDL goal of <100mg/dl. Carotid US assessment may be a helpful tool in the risk categorization of patients in primary prevention.

PP.44.12 PREVALENCE OF SUBCLINICAL ATHEROESCLEROSIS, INFLAMMATORY RESPONSE AND INSULIN RESISTANCE IN A HYPERTENSIVE PATIENTS IN PRIMARY PREVENTION SETTING

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Objective: 1º Analyze the prevalence of subclinical atherosclerosis, inflammatory response and insulin resistance (IR) in a hypertensive patients in primary prevention. 2º Analyze the independent association between hypertension (HT) and the following co variables: Age, Subclinical atherosclerosis (sATS), PCRus and HOMA.

Design and method: We have studied 1043 consecutive subjects that have completed their clinical, laboratory and carotid ultrasound (CUS) evaluation. We have excluded patients with diabetes and/or coronary artery disease and/or peripheral vascular disease. sATS was defined as one or more plaques detected by CUS using ARIC criteria. Infl. was defined by a usPCR >2 mg/dl. IR was determined by HOMA with 2,5 as cutoff value. We performed bivariate analysis comparing the different clinical, laboratory and ultrasound variables in patients with HT and those that did not have history or diagnosis of hypertension (No HT). We performed a multivariate analysis with logistic regresión with the Wald method to assess association of HT and the selected co variables.

Results: Prevalence of sATS, Infl. and IR can be observed in the table. The following variables were significantly associated with HT in the bivariate analysis: Age (57±12 vs 49±12 years, p<0.001); male gender (68% vs 22%, p:0.01); dyslipidemia (36% vs 29%, p<0.05); SBP (129 ±14 vs 116 ±13 mmHg, p<0.001); DBP (81 ±10 vs 75 ±10 mmHg, p<0.001); BMI (28 ±5 vs 26 ±5, p <0.001); 10 year Framingham Risk Score (7.02 ±6.27 vs 3.71 ± 4.70, p<0.001); HDL (55 ±14 vs 57 ±14 mg/dl, p<0.05); triglycerides (122 ±79 vs 106 ±88 mg/dl, p<0.01) and fasting blood glucose (98 ±12 vs 95 ±10 mg/dl, p< 0.001). After logistic regresión the co-variables associated independently with HT were age and sATS (both with p<0.001), resulting HOMA with borderline significance (p: 0.058).

	HT (n: 600)	No HT (n: 443)	*p value*
sATS	30% (95% CI: 26-35%)	9% (95% CI: 7-13%)	< 0.001
Infl.	34% (95% CI: 30-38%)	25% (95% CI: 21-30%)	< 0.01
Ins.Res.	38% (95% CI: 34-42%)	28% (95% CI: 24-33%)	< 0.01

Conclusions: Carotid US assessment allowed modifications in risk category of 3/10 patients with hypertension and showed the high prevalence of subclinical atherosclerosis in this patient population. We also observed that hypertension was independently related with age and subclinical atherosclerosis.

PP.44.13 ARTERIAL STIFFNESS IN HYPERTENSIVE WOMEN WITH LOW LEVELS OF VITAMIN D3

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Objective: Vitamin D is an independent predictor of cardiovascular disease and mortality from all causes.
The optimal concentration of 25 (OH) D3 in the blood should be approximately 30 ng / mL. Hypovitaminosis D is highly prevalent in Western populations adults. The discovery that many tissues and cells express receptors for vitamin D has opened new fields of research about its role in a variety of chronic diseases . In vitro, the active form of vitamin D has been shown eg by increasing vascular protective effects . the activity of NO. In addition, higher concentrations of Vitamin D have been associated with lower concentrations of plasma renin activity in hypertensive patients. Tomaschitz et al. showed an inverse relationship between renin, Ag II and vitamin D.
Two prospective studies have reported the association between baseline levels of Vit D and incidence of hypertension .
The aim of our study was to evaluate the correlation between hypovitaminosis D and PWV in a group of hypertensive women.

Design and method: We enrolled 52 hypertensive women and we divided depending on the values of Vit D3 into two groups. In both groups we performed the study of clinical artery stiffness.

Clinical caracteristics:

Low value Vit D3:	Normal value Vit D3:
Age m: 56.73 y	Age m: 52, 84 y
SBP mean 132.65 mmHg	SBP Mean: 131.54 mmHg
DBP mean 79.26 mmHg	DBP mean: 80.21 mmHg
PWV mean 11.61 m/s	PWV mean: 9.81 m/s
Vit D3 mean 14.86 ng/Ml	Vit D3 mean: 29.1 ng/mL

(deficiency <20, insuff 20-29, sufficiency > 29)

Results: Our work has shown that, for the same values of brachial blood pressure , patients with low levels of vitamin D3 have a greater arterial stiffness expressed as PWV that we know to be an independent predictor of cardiovascular risk.

Conclusions: The evaluation of vitamin D levels should be performed in all patients with hypertension. What remains is to evaluate whether oral supplementation of vitamin D could influence arterial stiffness.

PP.44.14 ARTERIAL HYPERTENSION INFLUENCE UPON POSTINFARCTION ISCHEMIC CARDIOMYOPATHY IN THE PATIENTS WITH NAFLD AFTER CORONARY REVASCULARIZATION

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Objective: To study influence of essential hypertension (EH) upon post-infarction ischemic cardiomyopathy development in the patients with non-alcoholic fatty liver disease (NAFLD) after coronary revascularization.

Design and method: Patients' after AMI preparing for CABG surgery case histories were retrospectively analysed. According to EchoCG and abdominal US data all patients were divided into 4 groups: 1) pts. with severe LV systolic dysfunction (EF <=35%) + NAFLD (61 pts.); 2) pts. with moderate LV systolic dysfunction (EF >35%) + NAFLD (64 pts.); 3) pts. with severe LV systolic dysfunction (EF <=35%) without NAFLD (64 pts.); 4) EF >35% without NAFLD (60 pts.). Pts. with known alcohol abuse history, viral hepatitis or cirrhosis were excluded from the study. There were 90,2% of men and 9,8% of women in mean age of 58,7±7,6 years.

Results: It was found that EH was mostly often found in the patients of group 2 - 58 pts. (90,63%), and group 4 - 54 pts. (90,0%), along with the least proportion of those in group 3: 41 (64,52%) pt. Accordingly, pts. in groups 2 and 4 had thicker LV walls, especially IVS: 1,26±0,22 cm and 1,23±0,22 cm, respectively. Patients in groups 1 and 3 had normal wall thickness values (1,05±0,23 cm and 1,06±0,25 cm, respectively), but significantly lower LV EF values: 28,46±5,03 and 28,32±4,46, respectively, compared to groups 2 and 4: 48,97±9,11 and 47,10±8,62, p<0,001. LVPW thickness significantly differed only in patients without NAFLD groups: 1,06±0,21 vs. 1,16±0,18, p<0,01 (see table).

	EF >35%) + NAFLD (n=61)	EF >35% + NAFLD (n=64)	EF >35%) without NAFLD (n=64)	EF >35% without NAFLD (n=60)
LV EF, %	28,46±5,03	48,97±9,11	28,32±4,46	47,10±8,62
EH	45 (73,77%)	58 (90,63%)	41 (64,06%)	54 (90,0%)
IVSd, cm	1,05±0,23	1,26±0,22	1,06±0,25	1,23±0,22
LVPW, cm	1,12±0,21	1,2±0,21	1,06±0,21	1,16±0,18

Conclusions: LV hypertrophy due to EH may serve as a factor contributing to ischemic post-infarction cardiomyopathy prevention, especially in the patients without NAFLD.

PP.44.15 FAMILY HISTORY OF PREMATURE CARDIOVASCULAR EVENTS AND CAROTID TOTAL PLAQUE AREA

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Objective: Although a positive family history for premature cardiovascular events has been considered a risk factor for decades, it has not been incorporated along with other established risk factors such as hyperlipidemia, hypertension, and cigarette smoking in daily clinical practice when physicians evaluate the cardiovascular risk of a patient. One reason may be the presence of multiple risk factors coexisting during these evaluations.
The objective of this research was to investigate if patients with a family history of premature cardiovascular events have higher carotid total plaque area than patients without it, in the absence of other classical risk factors.

Design and method: Patients from the primary prevention database of Blossom DMO program were identified to have positive family history of premature cardiovascular events (FHPCVE). After apply excluding criteria (absence of any classical risk factor) 23 patients qualified. A control group was generated reaching same data in variables (blood pressure, age, body weight, LDL cholesterol), except carotid total plaque area which was reported at the end of groups formation, once both groups were formed. We used the same definition as the Framingham study (family history of <55 years in men and <65 years in women, first degree relatives) to consider a patient with FHPCVE.

Results: The group with FHPCVE was similar to the control group. Age 59±2 vs. 60±1 yo, blood pressure 126±2/75±1 mmHg vs 127±1/74±1 mmHg, body mass index, 23±1 vs 24±1 Kg/cm²; they had a lower LDL cholesterol 116±15 vs 139±20 mg/dl (p<0.05). Despite lower LDL levels, patients with FHPCVE had a higher TPA: FHPCVE 49±8 mm² vs. controls 33±4 mm² (p<0.05). Framingham risk scores were similar, while the post-test risk of myocardial infarction (incorporating TPA) was lower in controls (16±1% vs 20±3%, p<0.05).

Conclusions: Our data indicates that patients with positive family history for premature cardiovascular events have a higher plaque burden, indicating increased risk of a cardiovascular event, even in the absence of other classical risk factor. Physicians should identify these patients early and treat them to prevent arterial deterioration.

PP.44.16 ISOLATED DIASTOLIC HYPERTENSION: POSSIBLE UNDERLYING MECHANISMS OF ITS DEVELOPMENT

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Objective: We examined whether the increased arterial stiffness and/or abnormal central hemodynamics are related to the development of isolated diastolic hypertension (iDiaHyp).

Design and method: In 1268 Japanese men without hypertension (43 ± 8 years old), the relationships of radial augmentation index (rAI) and brachial-ankle pulse wave velocity (baPWV) measured at the first examination with the presence of the iDiaHyp at the second examination (after 3 years' follow-up) were examined.

Results: Among these 1268 men, hypertension was detected at the second examination in 154 men (138 men were not under anti-hypertensive medication). Among these 138 hypertensive subjects without anti-hypertensive medication, 58 subjects were defined as iDiaHyp. At the initial of this follow-up period, while rAI and baPWV were higher in subjects with the development of hypertension (n=154) than in those without the development of hypertension (n=1114), both values were similar between hypertensive subjects with iDiaHyp (n=58) and those without iDiaHyp (n=80). Furthermore, the rAI and baPWV were significantly increased not only in hypertensive subjects without iDiaHyp but also in those with iDiaHyp (p<0.05). The change of baPWV during the study period was larger in hypertensive men without iDiaHyp (147±111 cm/sec) than that in men with iDiaHyp (89±112 cm/sec)(p=0.003). However, the change of rAI during the study period was similar between both groups (3.2±10.3 vs. 3.9±8.3 %, p=0.762).

Conclusions: While arterial stiffness was increased and central hemodynamics were augmented along with the development of hypertension, the extent of increase in arterial stiffness might be smaller in subjects with iDiaHyp than in those without iDiaHyp. This difference might be one of underlying mechanisms in the development of iDiaHyp.

PP.44.17 IMPACT OF CAROTID PULSE WAVE VELOCITY IN EVALUATION OF TOTAL ATHEROSCLEROTIC BURDEN

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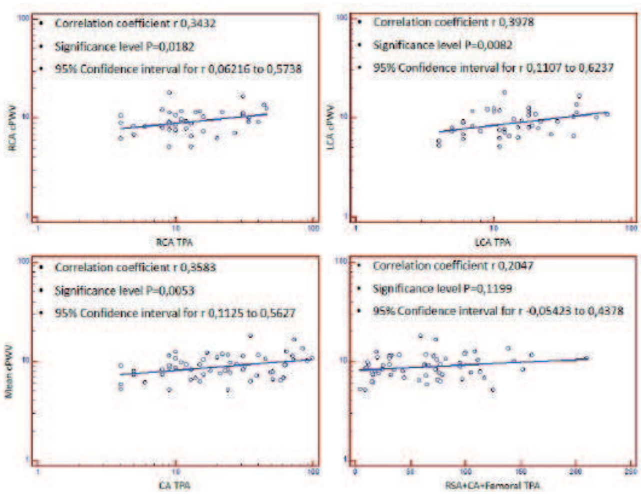
Objective: Subclinical atherosclerosis is currently considered as target organ damage (TOD), and it is associated with a higher risk of stroke and other cardiovascular events. Presence of an elevated pulse wave velocity (PWV) also increase cardiovascular risk. Carotid pulse wave velocity (cPWV) is related to arterial stiffness, but it has not been related to the atherosclerotic burden.
To determine whether cPWV is associated to local (carotid arteries - CA) or to total atherosclerotic burden (brachiocephalic trunk, right subclavian artery, carotid and femoral arteries).

Design and method: A cohort of 75 consecutive hypertensive patients were evaluated, from a cardiovascular primary prevention program. On a systematic approach, we evaluated sequentially (vascular ultrasound, 10 MHz probe), the brachiocephalic trunk and right subclavian artery (BT/RSA), both carotids (common/internal/external), and both femoral arteries (main/superficial/deep), following Mannheim Consensus criteria for plaque definition; cPWV and cIMT measurement (QAS/QIMT Esaote MyLab 60); and carotid-femoral tonometric PWV. Total plaque area (TPA) was also determined in every arterial location (plaque area in mm2).



Results: 60 patients with presence of plaque were included (57.6 ±10.9y, 65% male, SBP/DBP 141.8 ±18.2/84.4 ±10.3 mmHg). Mean cPWV was significantly associated with mean cIMT (r 0,5251; p<0,0001) and with bilateral carotid TPA (r 0,3583; p=0,0059), but not with total atherosclerotic burden (r 0,2047;

p=0,1199). Moreover, homolateral cPWV and carotid TPA were significantly associated, in right CA (r 0,3432; p<0,0001) as in left CA (r 0,3978; p=0,0082).

Conclusions: Carotid pulse wave velocity is related to arterial stiffness, and in this group of hypertensive patients was significantly associated with local atherosclerotic burden in carotid arteries, but not to total atherosclerotic burden when plaques were present in other artery locations.

PP.44.18 ATHEROSCLEROTIC BURDEN IS UNDERESTIMATED IN HYPERTENSIVE PATIENTS

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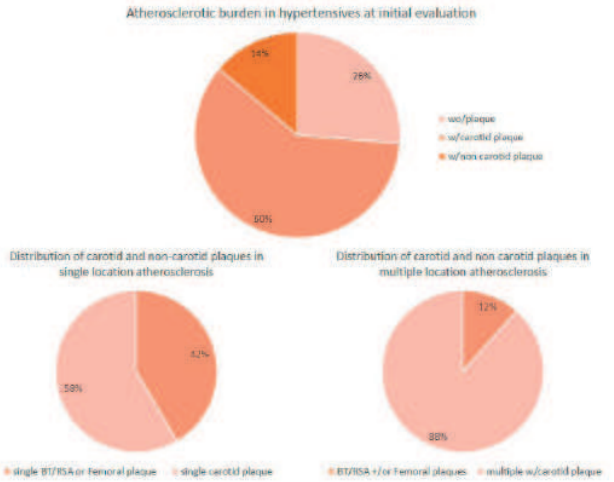
Objective: Atherosclerotic burden has been largely related to higher cardiovascular morbidity and mortality, in primary as secondary prevention, although it has not a specific definition. However, its prevalence is higher in those with major cardiovascular risk factors. Current guidelines in hypertension management recommend atherosclerosis screening only in carotid arteries, in the evaluation of target organ damage (TOD), with no recommendation of screening other arterial locations. This procedure could underestimate the prevalence of atherosclerosis in hypertensive patients.
To determine the total atherosclerotic burden in hypertensive patients, and to compare diagnostic effectiveness of a single (carotid arteries) versus a multiple location (other territories) arterial evaluation strategy.



Design and method: 4271 hypertensive patients (53.5 ±12.5 years, 67% male, SBP/DBP 141 ±17.9/86.5 ±10.3 mmHg) were included. Through a systematic approach of TOD evaluation, we sequentially have evaluated (ESAOTE MyLab40, 10MHz probe) the brachiocephalic trunk and right subclavian artery (BT/RSA), both carotid arteries (common/internal/external), and both femoral arteries (main/superficial/deep), following Mannheim Consensus criteria for plaque definition. Total plaque area (TPA) was also determined in every arterial location (plaque area in mm2).

Results: Prevalence of plaque identification was 73.7% (24% single plaque location; 76% multiple location). Single plaque location was observed in 755 subjects (10.7% BT/RSA, mean TPA 20.1mm2; 58.4% carotid, TPA 11.9mm2; and 30.9% femoral arteries, TPA 22.2mm2). Multiple plaque location was observed in 76% (88.4% with carotid involvement, 11.6% without carotid plaques).

Conclusions: Atherosclerosis was present in almost three out of four hypertensive patients when several arterial locations were screened. Other locations of plaques than carotid arteries were identified in almost a half of those with single plaque identification, while only 10% of those hypertensive patients with multiple plaques had no one in carotids. Screening for plaque in other locations than just the carotid arteries could increase the effectiveness in the detection of subclinical atherosclerosis in hypertensive patients.

PP.44.19 DRINKING CITRUS FRUITS INHIBITS VASCULAR REMODELING IN CUFF-PLACEMENT MOUSE MODEL

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Objective: Dietary habits are closely related to most lifestyle-related diseases. According to the epidemiological studies, citrus fruits are expected to have inhibitory effects on oxidative stress, thereby attenuating the onset and progress of cancers or cardiovascular diseases; however, there are few reports assessing their efficacy on vascular remodeling. Accordingly, we investigated the role of various drinking citrus fruits in vascular neointima formation using cuff-induced vascular injury mouse model.

Design and method: Male C57BL6 mice were divided into 5 groups as follows: 1) Control (water) (C), 2) 10% Citrus Unshiu (CU) (CU10), 3) 40% CU (CU40), 4) 10% Citrus Iyo (CI) (CI10), 5) 40% CI (CI40) drinking. After drinking them for 2 weeks from 8 weeks-old, cuff injury was induced by polyethylene cuff placement around the femoral artery. Neointima formation was evaluated by elastica van Gieson staining 2 weeks after cuff-placement. One week after cuff-placement, vascular samples were prepared and subjected to study the various parameters as follows. Inflammatory cytokine levels, superoxide anion production, cell proliferation, and expression of extracellular signal-regulated kinase (ERK) were assessed by RT-PCR, dihydroethidium staining, proliferating cell nuclear antigen staining and immunohistochemistory respectively.

Results: Neointima formation was significantly attenuated in CU40, CI10 and CI40 compared with C; however, no remarkable preventive effect was observed in CU10. The increases in various inflammatory markers including cytokine levels such as interferon regulatory factor-1, monocyte chemotactic protein-1, interleukin-6 (IL-6), IL-1β and tumor necrosis factor-α in response to vascular injury did not differ significantly between C, CU10 and CI10, but decreased in CU40 and CI40. However, the increase in superoxide anion production, cell proliferation and expression of phosphorylated ERK were remarkably attenuated in CI10, CI40, CU40, but not in CU10 compared with C.

Conclusions: These results indicate that drinking citrus fruits attenuate vascular remodeling partly via the reduction of oxidative stress and proliferative signaling. Interestingly, preventive efficacy of neointima formation was stronger in CI compared with CU. We are now investigating the detailed mechanism of their difference focusing on containing compositions.

PP.44.20 CROCIN TREATMENT REDUCES ATHEROSCLEROSIS IN APOE KNOCKOUT MICE BY AFFECTING ENOS AND HIF-1A EXPRESSION

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Objective: There are several studies indicating that crocin has hypolipidemic and antiatherosclerotic properties. We have previously shown that crocin treatment results in reduction of atherosclerotic lesions in ApoE knockout mice, without significantly affecting the plasma lipid profile.
To determine the mechanism of the antiatherosclerotic effect of crocin in ApoE knockout mice.

Design and method: Crocin was administered to the mice at a dose of 100 mg/kg in the drinking water. Sixty two (62) animals were used in the present study, divided in four groups as follows: thirty one (31) animals (17 M and 14 F) were given crocin whereas 31 animals (17 M and 14 F) were used as Controls. The mice were purchased from the Jackson Laboratory, USA and were maintained on a standard chow diet containing 5% fat. Drug treatment was initiated at the 16th week of age, and the animals were maintained for 16 additional weeks on the designated treatment. At 32 weeks of age the proximal aorta was removed for atherosclerosis area measurement and sections of 3μm were used to determine the expression of eNOS and HIF-1a by immunohistochemistry. ANOVA and 2-tailed unpaired Student's t test were used for statistical analysis and all values are expressed as Mean±SEM.

Results: As previously shown, crocin reduced atherosclerosis area (mm2) in both male and female mice compared to controls [Male] (Crocin:0.079±0.01 vs Control:0.191±0.03, p=0.002) – [Female] (Crocin:0.098±0.02 vs Control:0.176±0.02, p<0.03), without significantly affecting the plasma lipid profile of treated animals. eNOS expression was significantly increased in crocin treated mice [Male] (Crocin:2.786±0.239 vs Control:1.500±0.342, p=0.004) – [Female] (Crocin:3.500±0.522 vs Control:1.167±0.441, p=0.003), while HIF-1α expression was significantly decreased in crocin treated male and female mice compared to Controls (21.25±2.14 vs. 155.5±6.67, p<0.001).

Conclusions: Crocin treatment results in reduction of atherosclerotic lesions in ApoE knockout mice, by significantly affecting eNOS and HIF-1a expression at the atherosclerosis area.

PP.44.21 OMEGA-3 POLYUNSATURATED FATTY ACIDS IN HYPERTENSIVE POSTMENOPAUSAL WOMEN

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Objective: To asses erythrocyte membrane lipids fatty acids composition in hypertensive and normotensive postmenopausal women.

Design and method: 203 women with surgical and natural menopause were included in the investigation: the 1st group - 88 hypertensive patients (average age 43,2±2,7 years, menopause duration 4,3±2,1 years); the 2nd group - 115 normotensive women (average age 47,3±5,4 years, menopause duration 4,8±5,4 years). 35 healthy women were included in the control group. All patients underwent general clinical examination, body mass index (BMI) calculation, measurement of waist circumference, menopausal index evaluation, ambulatory blood pressure and electrocardiogram monitoring (Cardiotens-01, Meditech, Hungary), determination of general cholesterol, lipid fractions and glucose tolerance. We also assessed the proportion of different fatty acids in erythrocyte membranes. Statistical methods such as Cruskell-Walles, Dan and Spyrmen correlation criteria were used.

Results: All patients in menopause had expressed changes in fatty acids composition of erythrocyte membranes in comparison with healthy women: saturated acids relative content was increased, and unsaturated acids relative content was decreased, especially in hypertensive women. The most serious deviations concerned omega-3 polyunsturated acids: relative contents of alpha-linoleic acid in patients of the 1st group was 3,1 times less than in control group (P<0.001); patients of the 2nd group demonstrated 2,8 times decrease of this index in comparison with healthy women (P<0.001). The content of eicosapentaenoic acid in the 1st and the 2nd groups was 42% and 27% less than in control group, relatively (P<0.01). The same changes in the 1st and the 2nd groups were enrolled to docosapentaenoic and arachidonic acids: they were 3 - 2,1 times less and 2,8 - 2,4 times less than in healthy women, relatively (P<0.001). Main parameters reflecting arterial hypertension severity in postmenopausal women correlated negatively with alpha-linoleic, eicosapentaenoic acid content and common polyunsturated acids content (correlation coefficients from -0.32 to -0.58, P<0.001).

Conclusions: Postmenopausal women, especially suffering with arterial hypertension, have severe changes in fatty acids composition of erythrocyte membranes. This fact may reflect the role of detected disturbances in target organ damage and atherosclerosis progression in postmenopausal women.

PP.44.22 EFFECTS RESVERATROL VS ROSUVASTATIN ON LIPID PROFILE IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective: Evaluation of the effect of resveratrol compared with rosuvastatin on lipid profile in patients with essential hypertension.

Design and method: We included 73 patients (age 55,6±1,5 years). All patients were examined: physical examination, serum biochemistry, office measurement BP, ambulatory BP monitoring.
All patients were treated with standard antihypertensive therapy. Patients were divided into two groups: I group (n=38) rosuvastatin 20 mg, after 1 month 50 mg resveratrol was added. II group (n=35) resveratrol 50 mg, afte month 20 mg rosuvastatin was added. Follow-up of 2 months.
Level of total cholesterol patients I group was 6,3±0,2 mmol/l, after one month of observation-5,1±0,1 mmol/l, two months 4,6±0,1 mmol/l. Level of HDL changed as: 1,30±0,04/1,40±0,02/1,5±0,03 mmol/l, respectively. Level of LDL changed as 3,7±0,1/2,9±0,1/2,7±0,1 mmol/l, respectively. Level of the TG changed as 1,8±0,2/1,5±0,1/1,4±0,1 mmol/l, respectively.
In II group level of total cholesterol in the early follow-up was 6,8±1,2 mmol/l, a month-5,0±0,1 mmol/l, in two months-4,6±0,1 mmol/l. Level of HDL changed as: 1,4±0,04/1,5±0,04/1,9±0,4 mmol/l, respectively. Level of LDL changed as: 3,6±0,2/3,0±0,1/2,7±0,1 mmol/l, respectively. Level of TG changed so: 1,4±0,2/1,2±0,1/1,2±0,1 mmol/l, respectively.

Results: After analisys we noted that in resveratrol group afte one month level of total cholesterol decreased by 26,5%(δ-1,8)(p=0,07;r=0,136), two months another 8%(δ-0,4) (p=1,6;r=0,793), decreased all period was 32,4%(δ-2,2) (p=0,03;r=0,132). The level of TG decreased by 14,3% (δ-0,2) (p=0,03;r=0,854) after a month. Level of HDL increase 7,1%(δ+0,1) (p=0,003;r=0,663)/26,7% (δ+0,4) (p=0,13;r=0,242)/33,3% (δ+0,5) (p=0,08;r=0,197), respectively. Level of LDL decreased by 16,7% (δ-0,6) (p=1,56;r=0,746)/10% (δ-0,3) (p=2,03;r=0,864)/25% (δ-0,9) (p=1,95;r=0,618), respectively.
In rosuvastatin group a month observation a decrease in total cholesterol by 19%(δ-1,2) (p=0,943;r=0,552), after two monthes 7,9% (δ-0,5) (p=0,249;r=0,755), decreased all period was 30%(δ-1,7) (p=0,429;r=0,424). Level of TG decreased by 16,6%(δ-0,3) (p=0,004;r=0,805)/6,7% (δ-0,1) (p=0,02;r=0,81)/22,2% (δ-0,4) (p=0,0003; r=0,770), respectively. Level of HDL increase 7,7%(δ-0,1) (p=0,005;r=0,477)/7,7% (δ-0,14) (p=1,6;r=0,549)/15,4% (δ-0,002) (p=1,6;r=0,348), respectively. Level of LDL decreased by 21,6% (δ-0,8) (p=2,08;r=0,552)/7% (δ-0,2) (p=0,21;r=0,756)/27% (δ-1) (p=0,44;r=0,786), respectively.

Conclusions: We observed effective reduction LDL, total cholesterol, TG and increase HDL in patients with essential hypertension receiving as resveratrol, as rosuvastatin. But more than significant decrease of these parameters, we noted in group of resveratrol.

PP.44.23 HYPERHOMOCYSTEINEMIA IS A RISK FACTOR FOR CEREBROVASCULAR STIFFNESS IN HYPERTENSIVE PATIENTS, ESPECIALLY ELDERLY MALES

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Objective: Hyperhomocysteinemia is an independent risk factor for cardiovascular disease, especially stroke. The resistive index (RI) calculated using carotid flow velocity reflects a downstream arterial resistance and a risk of cerebral infarction.

Design and method: We measured serum homocysteine levels and performed carotid artery ultrasound and measured carotid RI in 261 patients with essential hypertension. The patients were divided into two groups according to their serum homocysteine level.

Results: The high homocysteine group (>=10 mol/L) had a lower eGFR (p<0.001) and higher uric acid level (p<0.001) and carotid resistive index (RI) (p=0.001) than the low homocysteine group. A higher RI indicates more advanced cerebrovascular stiffness. Carotid RI was associated independently with age and homocysteine level. The patients were stratified further according to age (<65 yr or >=65 yr) and gender, and the relationship between homocysteine and carotid RI then examined. Carotid RI was increased in the high homocysteine group compared with the low homocysteine group only in elderly males. Multiple regression analysis showed that serum homocysteine level was an independent determinant of carotid RI.

Conclusions: These results suggest that hyperhomocysteinemia is a risk factor for cerebrovascular stiffness in hypertensive patients, especially elderly males.

PP.44.24 EVOLUTION OF RENOVASCULAR ATHEROSCLEROSIS: A HISTOPATHOLOGICAL HYPOTHESIS

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Objective: Renovascular Atherosclerosis (RA) leading complications are severe hypertension (HT) and end stage renal disease (ESRD). However pathogenesis of the renal damage is not fully understood, being attributed to the interactions of different factors like RAAS, nefrosclerosis, ischemia, HT. Although diagnosis of RA is frequently done at its symptomatic phases (HT-ESRD), we thought that evaluation of its histopathological characteristics in asymptomatic phases could contribute to its better understanding. AIMS: to develop a histopathological characterization of asymptomatic RA and analyze its potential role in ESRD.

Design and method: We evaluated 139 subjects died due to suicide, murderer or accident consecutively admitted for autopsy (Judicial Morgue, Buenos Aires). To be included subject must have asymptomatic renovascular atherosclerosis with a unilateral plaque < 40% stenosis, plus mild HT and normal renal function when alive. A final population of 42 subjects were included after applying exclusion criteria (cardiovascular events, renal function impairment). We classified them in a) group RA (atherosclerotic renal plaque n: 21) b) group NA (normal renal arteries n: 21). Vessel specimens were fixed (IHC-Zinc, BD Biosciences Pharmingen) obtaining 4 µm sections, analized with HE, P.A.S. and Masson by two blinded expert. Atherosclerosis stage was defined according to AHA classification and Virmani.

Results: A high prevalence-71%- of plaques in AHA's Vc was observed, while 24 % were in stage IV 24%, 5% VIb 5%. Characteristics of histopathological findings are shown in table.

[illegible]	[illegible]
Adventitial neovascularisation	18
T Cell in cumulies	15
Reticular Fibrosis	14
Elastic laminae fragmentation	6
Intraplaque hemorraghe	4
Elastic fibras	4
T cells discmination	4
Endothelial disruption	3
Nuclear necrosis	2
Lipid nucleo	2
Thrombosis areas	2

Table. Histophatological findings in asymptomatic renal atherosclerotic plaques.

Conclusions: Advanced stages of atherosclerosis were found in asymptomatic renal plaques, suggesting a clinical- physiopathological dissociation phenomena. A intense neovascularisation provide a favorable environment for plaque nutrition and grow although in this early clinical phases. Plaque characteristics could lead to tromboembolization and immunoinflammatory activation as relevant mechanisms for ESRD.

PP.44.25 PRESENCE SUBCLINICAL CAROTID AND PERIPHERAL ARTERIAL DISEASE IN PATIENTS WITH ARTERIAL HYPERTENSION

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Objective: Ankle-brachial index (ABI) and carotid intima-media thickness (CIMT) are non-invasive markers of early atherosclerosis and allow the detection of a subgroup of patients at a high level of cardiovascular risk.
The aim of study was to determine presence subclinical carotid and peripheral arterial disease in patients with arterial hypertension (AH).

Design and method: The study enrolled 184 examinees divided into three groups. The first (I) group consisted of patients with AH and coronary artery disease (CAD), N=80, the second (II) group were patients with AH without CAD, N=54 and the third control group (III) were healthy examinees without AH, N=50. For all patients there was determined: risk SCORE, laboratory analyses, ABI, color doppler sonography of the carotid arteries.

Results: Cardiovascular risk SCORE was significantly higher in patients with AH (p<0,0001). The value of the ABI in patients with AH and CAD was the lowest (0,99±0,21) and significantly lower than in the second and third group (I vs II p<0,001, I vs III p<0,0001, II vs III p=0,01). Abnormal values ABI were found in 62.5% of patients, 46% <= 0.9, 16% >= 1.3. The value of the CIMT in patients with AH and CAD was the highest (1,01±0,19) and significantly higher than in the second and third group (I vs II p<0,0001, I vs III p<0,001, II vs III p=0,01). Carotid plaques were found in 69 (86%) of patients from the first group (vs.28 (51,85%) in the second and 6 (12%) in the third group), I vs II p<0.001, I vs III p< 0.001, II vs III p< 0.001). Carotid stenosis >= 50 % had 21% of patients in the first groups (vs. 5,5% in II , 0% in III group). They had a higher average number of carotid plaques (I vs II p <0,0001, and vs III, p< 0,0001) and percentage of stenosis. Abnormal values for both, ABI and CIMT, had 37(46%) examinees of the first and 6(11%) of the second group, p<0.001.

Conclusions: Ankle-brachial index and CIMT reveal a significant incidence carotid and peripheral arterial disease in patients with AH and CAD.

PP.44.26 THE CORRELATIVE ANALYSIS WITH ARTERIAL STIFFNESS, CAROTID IMT AND AORTIC VALVE SCLEROSIS IN HYPERTENSIVE PATIENTS WITH CORONARY ARTERY DISEASE

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Objective: The purpose of this study was to examine the relationship between carotid intima-media thickness (carotid IMT), aortic valve sclerosis (AVS) and indices of arterial stiffness, including pulse wave velocity (PWV) and augmentation index (AIx) in hypertensive patients with suspected coronary artery disease (CAD).

Design and method: The study included 44 patients who were scheduled to undergo coronary angiograpahy (25 males, 19 females, mean age 64.9) in hypertensive patients with suspected coronary artery disease. Carotid IMT and AVS measurements were done using high resolution ultrasound machine. PWV was measured using PP-1000 (Hanbyul meditech) at carotid, radial, femoral and dorsalis pedis arteries on supine position. So we got the three PWV including aorta, leg and arm. AIx of peripheral pressure and central pressure were measured using GAON 21A (Hanbyul meditech) at radial artery.

Results: Of the 44 patients, 25 patients (56.8%) were diagnosed as having CAD on coronary angiography. All patients had AVS. A relatively good correlation was obtained between the presence of the carotid IMT and PWV of the upper arm (p=0.009). There was a significant correlation between the presence of the CAD and PWV of the upper arm (P=0.05) and lower leg (P=0.039), and also Aix (peripheral AIx, P=0.041, central AIx, p=0.021). There were no correlation between the severity of CAD and AVS (P=0.322), the presence of CAD and the carotid IMT (meanIMT P=0.234, maxIMT P=0.299). But according to the severity of CAD, it seemed to have a tendency to increase the carotid IMT.

Conclusions: Of the four non-invasive methods, PWV, AIx and AVS may be considered as useful clinical markers for determining coronary artery atherosclerosis in hypertensive patients. Therefore there is association between the presence of the CAD and arterial stiffness in hypertensive patients.

PP.44.27 IS GLYCATED HEMOGLOBIN LEVEL AND SUBCLINICAL ATHEROSCLEROSIS RELATED IN NON-DIABETIC INDIVIDUALS?

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Objective: The purpose of this study was to analySe the relationship between glycated hemoglobin A1 (HbA1c) levels and subclinical atherosclerosis assessed by carotid intima-media thickness (IMT), presence of carotid plaque (CP) and pulse wave velocity (PWV) in patients without diabetes.

Table. OR for plaque presence according to HbA1c level

HbA1c Level (%)	Univariate OR	*p*-value	Multivariate OR	*p*-value
HbA1c <5.5% (n=54)	1		1	
5.5≤HbA1c<6.0 (n=113)	2.360 (1.16-4.80)	0.018	1.775 (0.74-4.27)	0.201
6.0≤HbA1c<6.5 (n=47)	3.636 (1.38-9.61)_	0.009	1.853 (0.59-5.79)	0.289

Data are relative odds (95% CI), Multivariate analysis adjusted for age, height, HTN, Previous PCI.

Design and method: From January 2011 through December 2012, carotid IMT and CP presence were evaluated in 214 non-diabetes patients (118 male, 96 female) with measurement of HbA1c, ankle-brachial index (ABI), brachial/femoral and heart to femoral PWV. HbA1c level was categorized into 3 groups (<5.5%, 5.5% to 5.9%, and 6.0% to 6.4%).

Results: Baseline characteristics were similar between three groups except age. There were no significant linear trends between groups either in PWV and carotid IMT measurement; however, the presence of CP showed significant linear trend (P for trend= 0.004). Odd ratios (ORs) of univariate model for presence of CP was 2.36 and 3.6 in the middle (5.5<= HbA1c<6.0) and highest HbA1c (6.0<=HbA1c<6.5) group compared with the lowest group (HbA1c <5.5%) (p=0.018 and p=0.009, respectively). Sub-analysis of 115 non-diabetic patients (57 male, 58 female) with hypertension showed poor agreement in linear increase of carotid IMT, PWV measurements and plaque presence according to the elevation of HbA1c level which the result might have been influenced by other factors.

Conclusions: Carotid IMT and PWV in non-diabetic individuals had poor correlation with HbA1c level; however, there was a significant linear relation between three groups in presence of CP.

PP.44.28 ATHEROSCLEROSIS IN DESCENDING THORACIC AORTA MIGHT BE INDEPENDENTLY RELATED WITH CORONARY ARTERY DISEASE ON COMPUTED TOMOGRAPHY CORONARY ANGIOGRAPHY

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Objective: Computed tomography coronary angiography (CTA) is a well-established modality for the evaluation of coronary artery disease (CAD) and also permits visualization of the descending thoracic aorta (DTA). Atherosclerosis in the DTA, a marker of diffuse atherosclerotic cardiovascular disease, is frequently observed, and, various imaging techniques have demonstrated the association between DTA atherosclerosis CAD. The aim of this study was to assess associations between DTA atherosclerosis and CAD.

Design and method: The study was a retrospective analysis of the findings in 237 patients performed CTA for evaluation of suspected CAD at our single center in the period between February 2006 and December 2008. The patients with history of CAD or coronary revascularization were excluded. In DTA analysis of CTA, the presence of atherosclerotic plaque was defined as wall thickness >,=2 mm in at least one DTA segment. In CAD analysis of CTA, the presence of atherosclerotic plaque and severity of luminal stenosis were determined from CTA. For each segment, the severity of luminal stenosis was visually scored as follows: non-significant CAD (<50 % stenosis) and significant CAD (>,=50 % stenosis).

Results: The patients were 107 men and 130 women (45:55%) with mean age of 66 years. The incidences of diabetes, hypertension, smoking and hyperlipidemia were 27.0% (n=64), 43.0% (n=102), 28.7% (n=68) and 34.2% (n=81), respectively. The incidences of DTA plaque, DTA calcification and significant CAD were 60.3% (n=143), 67.5% (n=160) and 47.7% (n=113), respectively. The incidences of DTA plague (significant CAD vs non-significant CAD, 76.1% vs 46.0%, p=0.032) and calcification (significant CAD vs non-significant CAD, 74.3% vs 61.3%, p=0.032) were significantly higher in significant CAD. In multivariate analysis after adjustment of CAD associated factor including age, sex, diabetes, hypertension, smoking, hyperlipidemia, renal function, ejection fraction and DTA calcification, DTA plaque is the independent predictor of significant CAD (HR: 3.6, 95% CI: 1.9-6.9, p<0.001).

Conclusions: The presence and severity of DTA atherosclerosis might be independently related with CAD on CTA.

PP.44.29 RELATIONSHIP BETWEEN ALCOHOL CONSUMPTION AND SERUM LIPID PROFILES AMONG MIDDLE-AGED POPULATION OF CHINA: A MULTIPLE-CENTER CARDIOVASCULAR EPIDEMIOLOGICAL STUDY

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Objective: We assessed the relationships between alcohol consumption and serum lipid levels among middle-aged Chinese population.

Design and method: Across-sectional survey on risk factors of cardiovascular disease was conducted in 2009-2010. There were 10154 (85.94%) participants were eligible for analysis. Self-reported lifestyle and clinical risk factors were collected using a questionnaire, and fasting serum lipid levels were measured.

Results: The overall prevalence of drinking is 34.07 % in male, 3.61% in female. Heavy alcohol drinkers (>= 30g per day) tended to be older, smoker, hypertensive, heavy physical activity and lower body mass index. High-density lipoprotein cholesterol level, apolipoprotein A1 level, low-density lipoprotein cholesterol / high-density lipoprotein cholesterol ratio and apolipoprotein B / apolipoprotein A1 ratio increased with the alcohol intake increase in both gender. An increase of 0.269 mmol/L triglyceride and decrease 0.269 mmol/L lipoprotein(a) were observed for male alcohol drinkers who consumed >=30 g alcohol per day compared with abstainers after controlling for all confounders. Additionally, an increase of Lipoprotein(a) level with the alcohol intake increase was observed in female.

Conclusions: Total cholesterol, high-density lipoprotein cholesterol and apolipoprotein A1 levels increased with the alcohol intake increase in both gender, and the lipoprotein(a) decreased with the alcohol intake increase in male. However, these associations in female still need further investigated.

PP.44.30 AGE AND DURATION OF HYPERTESNION ARE THE MOST POWERFUL RISK FACTORS FOR DEVELOPMENT OF SUBCLINICAL ATHEROSCLEROSIS

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Objective: During the last two decades, carotid ultrasound has been established as a screening tool for detection of subclinical atherosclerosis. Many studies have found statistically significant correlation between carotid intima- media thickness (IMT) and coronary artery disease and cerebro-vascular disease. That is why the IMT above 0.9 mm, or presence of plaque in the carotid arteries are considered in the current Guidelines for management of hypertension to be markers of targed organ damage.
The aim of our study was to find the correlation between various risk factors and subclinical carotid atherosclerosis in a group of hypertensive patients.

Design and method: We studied 72 hypertensive patients (40 female and 32 male) at mean age of 59,46±9,51. They were asked about their awearness and duration of hypertension, diabetes and smoking. Fasting blood samples for glucose, total cholesterol, LDL, HDL, triglycerides, uric acid, CRP and SR were collected. Bilateral ultrasonografic examination of the carotid arteries was performed. Patients with signs and symptoms of coronary artery disease or heart failure, cerebro vascular disease, renal failure or peripheral artery disease were excluded from the study.

Results: The mean values of the IMT were: 0.84±0.14 mm fot the left common carotid artery and 0.83±0.14 mm for the right one. We also found presence of plaque in 22.2 % of the asymptomatic hypertensive patients.
The correlational analysis showed that age and duration of hypertension were the only quantitative parameters with statistically significant correlation with IMT.
We also performed a binary logistic regression analysis. And again the age and duration of hypertension were the only predictors of subclinical atherosclerosis (defined as IMT above 0.9 mm or presence of plaque).

Conclusions: In our relatively small study, age and duration of hypertension were the only independent predictors for development of subclinical carotid atherosclerosis. That may by one of the explanations why hypertension is the most powerful risk factor for stroke. The modern medicine still can't stop the natural process of aging, but at least can slow down the premature aging by early detection and proper treatment of hypertension.

PP.44.31 ANNEXIN A5 MAY COUNTERACT INCIPIENT ARTERIAL STIFFNESS AND ATHEROSCLEROTIC VASCULAR DISEASE IN TREATED HYPERTENSIVE PATIENTS

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Objective: It has been demonstrated that annexin A5 (AnxA5) is associated with atherosclerotic cardiovascular disease and endothelial dysfunction: it seems to attenuate vascular inflammation and improve vessel wall function and plaque integrity.
The aim of our study is to investigate possible relations between annexin A5 and arterial stiffness assessed by means of cf-Pulse Wave Velocity (PWV), indicative of vascular organ damage.

Design and method: We enrolled 175 consecutive grade 1 hypertensive patients with fairy controlled BP values (HT) and 175 healthy controls (C). First, we assessed AnxA5 relationship with clinical variables (age; heart rate, HR; systolic and diastolic blood pressure, SBP and DBP; BMI and PWV) in the whole population (Pearson R). Then we compared AnxA5 levels in patients with (OD, n 193) and without (NOD, n 155) vascular organ damage (i.e PWV>= 10 m/sec) (T student).
Afterwards we repeated the same division within HT and C obtaining four groups (HTOD, n 110; HTNOD, n 35; COD, n 57; CNOD, n 114;) in which we compared AnxA5 concentrations (ANOVA).

Results: On the whole population (n= 350, 55±15 years) we found a correlation between AnxA5 levels and PWV (p 0.04, r 0.10), SBP (p 0.03, r 0.11), HR (p 0.01, r 0.13) and age (p 0.01, r 0.13), while it was not correlated with DBP and BMI.

AnxA5 plasma levels were higher in OD than in NOD (12.5±9.7 vs 10.1±7.46 ng/mL, p-value 0.005). Moreover, AnxA5 plasma levels were higher in HT-NOD and HTOD compared with CNOD (14.2±10.9 and 13.2±10.2 vs 8.8±7.31, p<0.05) even after adjusting for age.

Conclusions: Our preliminary data show that AnxA5 levels have a relationship with arterial stiffness in hypertensive and healthy subjects. We can speculate that AnxA5 can be upregulated in treated hypertensive patients in an attempt to counteract incipient aortic stiffness that is indicative of initial atherosclerotic disease.

PP.44.32 CARDIOTROPHIN-1 IS AN EARLY BIOMARKER OF HYPERTENSION-INDUCED TARGET ORGAN DAMAGE

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Objective: Hypertension induces alterations in several organs that due to their susceptibility to this pathology are called target organs. The search of early biomarkers to detect the initial insult has been a priority in the last decade. We have analysed the role of cardiotrophin-1 (CT-1), a cytokine with hypertrophic effects in heart and other tissues, as a potential biomarker of hypertension-induced target organ damage.

Design and method: We have analysed 299 hypertensive patients and 99 healthy controls. We evaluate systolic (SP) and diastolic (DP) blood pressure continuously during 24 hours. Renal function was assessed by microalbuminuria and albumin/creatinine index. Retinopathy was evaluated by non-midriatic retinography with a validated software. Ankle-brachial index (ABI) was used to determine arterial stiffness. Serum CT-1 was analysed by ELISA.

Results: CT-1 serum levels are correlated with SP and DP, as well as with microalbuminuria and albumin/creatinine index. Higher CT-1 levels are also correlated with lower ABI levels, and with higher degrees of retinopathy in hypertensive patients.

Conclusions: Higher CT-1 levels in plasma are related with higher blood pressure levels and with target organ (kidney, vessels, retina) damage.

PP.44.33 RISK FACTORS, TARGET ORGAN DAMAGE AND CARDIOVASCULAR DISEASE ASSOCIATED WITH THE CARDIO ANKLE VASCULAR INDEX

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Objective: To analyse cardiovascular risk factors, target organ damage and associated clinical conditions, according to the 2013 European Society Hypertension Guidelines, and which of them are associated with the Cardio-Ankle Vascular index (CAVI).

Design and method: We performed a cross sectional study and included 503 subjects, aged 30 to 75 years (mean: 60.35 ± 8.44), 54.3% men, without cardiovascular diseases from the MARK study, selected by consecutive sampling from a Spanish health center. Measurement: Cardio Ankle Vascular index (CAVI) using the VaSera device (Fukuda Denshi). We used systolic blood pressure (SBP), as a quantitative variable, and cardiovascular risk factors (RF), target organ damage (TOD) and diabetes, cardiovascular or renal disease, as categorical variables, according the 2013 European Guidelines on Hypertension. Multiple linear regression analysis using the stepwise method was performed.

Results: The mean CAVI was 8.47±1.06; in men 8.48 ±1.10 and in women 8.44±1.01 (p>0.05). 33.7% were less than 8 (normal), 34.9% were between 8 y 9 (borderline) and 31.3% were equal or higher than 9 (atherosclerosis probably). Mean BP was 134/81 mmHg. The mean number of RF was 2.79±1.24 and TOD 0.76±0.94.

In multiple linear regression analysis, considering CAVI as a dependent variable, with a corrected $R2 = 0.36$, the variables that remained in the equation were: systolic blood pressure (ß=0.01, 95%IC 0.01 to 0.02, p<0.001); male sex (ß=-0.25, 95%IC -0.42 to -0.08, p=0.004); age (ß=0.76, 95%IC 0.58 to 0.95, p<0.001); smoking (ß =-0.19, 95%IC -0.38 to 0.00); impaired fasting glucose (ß=0.23, 95%IC 0.02 to 0.47, p< 0.066); obesity (ß =-0.62, 95%IC -0.81 to -0.44, p<0.01); pulse wave velocity (ß =0.49, 95%IC 0.22 to 0.72, p<0.001) and diabetes mellitus (ß=0.32, 95%IC 0.12 to 0.53, p=0.002).

Conclusions: The risk factors associated with CAVI were, systolic blood pressure, male sex, age, smoking, impaired fasting glucose and obesity. Target organ damage as a cardiovascular disease was associated with pulse wave velocity, and diabetes mellitus.

PP.44.34 THE RELATIONSHIP BETWEEN THE CARDIO-ANKLE VASCULAR INDEX (CAVI) AND CARDIOVASCULAR RISK ESTIMATED WITH EUROPEAN AND AMERICAN RISK SCORES. MARK STUDY

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Objective: To analyze relationships between the Cardio-Ankle Vascular Index and cardiovascular risk estimated by scores from European and American populations.

Design and method: We performed a cross sectional study and included 503 subjects, aged 30 to 75 years (mean: 60.35 ± 8.44), 54.3% men, without cardiovascular diseases from the MARK study, selected by consecutive sampling from a Spanish health center. Measurement: Cardio-Ankle Vascular Index (CAVI) using the VaSera device (Fukuda Denshi). Risk factors and cardiovascular risk estimated by SCORE scale (2003), European Guidelines on Hypertension score (2013), Framingham D'Agostino score (2008) and American Heart Association (AHA) score (2013).

Results: The mean CAVI was 8.47±1.06; in men 8.48 ±1.10 and in women 8.44±1.01 (p>0.05). 33.7% of measurements were less than 8 (normal), and 34.9% were between 8 y 9 (borderline) and 31.3% were equal to or higher than 9 (atherosclerosis probably).

The CVR with the Framingham D'Agostino score was 20.05±13.25, with the AHA 2013 it was 13.20±9.89 and with SCORE it was 3.43±3.19. With the European guidelines on hypertension 2013 11% were in the low risk category (CAVI 7.99 ±0.85), 52% were at moderate risk (CAVI 8.31 ±1.00), 23% were at high risk (CAVI 8.76±1.00), and 14% were ar very high risk (CAVI 8.89±1.23) (p<0.01).

We found a positive correlation between CAVI with cardiovascular risk estimated using SCORE (r=0.550), Framingham D'Agostino (r= 0.326) and AHA 2013, (r=0.466) (p<0.001 for all). These associations were maintained after adjustment for age.

In multivariate analysis of variance, controlled by age, we found estimated marginal means of cardiovascular risk in all scores, a lower cardiovascular risk in CAVI < 8, intermediate cardiovascular risk in CAVI between 8-9 and a higher cardiovascular risk in CAVI => 9.

Conclusions: The Cardio-Ankle Vascular Index is directly associated with cardiovascular risk estimated by different scales based on European and American populations, and this is maintained after adjusting for age.

PP.44.35 FIBRINOLYTIC AND INFLAMMATORY ALTERATIONS IN FAMILIAL COMBINED HYPERLIPIDEMIA, AND THE IMPACT OF ANGIOTENSIN II

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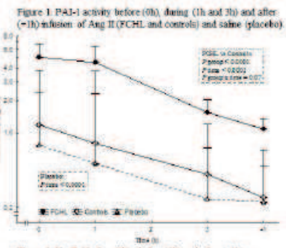
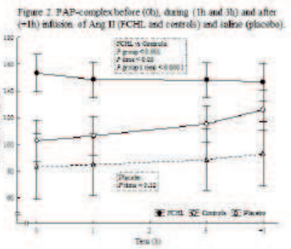
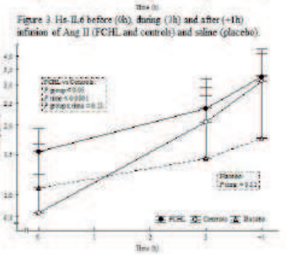
Objective: Subjects with familial combined hyperlipidemia (FCHL) have a poor vascular outcome. Angiotensin (Ang) II may be involved in the development of cardiovascular disease, which is characterized by haemostatic alterations and low-grade inflammation. We studied fibrinolytic and inflammatory alterations, and the impact of Ang II, in 16 otherwise healthy untreated subjects (11 men, mean age 47±6 years) with FCHL, and 16 age and sex matched healthy controls. Additional experiments with placebo (physiological saline) in 8 subjects verified stability of the experimental design.







Design and method: Plasma markers of fibrinolysis (plasminogen activator inhibitor-1 (PAI-1) activity) and plasmin-antiplasmin (PAP) complex), and inflammation (hs-IL6, leucocyte count, hs-CRP, and fibrinogen) were assessed in conjunction to Ang II infusion (10 ng/kg/min intravenously for 3 h). Blood was collected before, during, and 1h after Ang II infusion. Statistical analyses by repeated measures ANOVA, log transformation when appropriate.

Results: Baseline PAI-1 activity and PAP complex were higher in FCHL (both p<0.0001 vs controls). PAI-1 activity decreased during Ang II infusion, similarly in FCHL, controls, and by placebo (all p<0.0001, Figure 1), whereas PAP-complex was unaffected in FCHL and by placebo, but increased in controls (p<0.0001, Figure 2). Baseline hs-IL6, leucocyte count, and hs-CRP were higher in FCHL (p<0.01, p<0.01, and p<0.05 vs controls), while fibrinogen was similar in both groups. During Ang II, hs-IL6 increased in FCHL and controls (both p<0.0001), while the increase in placebo was non-significant (p=0.11, Figure 3). Also, leucocyte count increased in FCHL and controls during Ang II (p<0.0001 and p<0.001), while leucocyte count levels were unaffected by placebo. Fibrinogen was unchanged by Ang II in all groups.

Conclusions: FCHL exhibits signs of increased fibrinolytic activity and ongoing low-grade inflammation, and this may contribute to the development of future cardiovascular complications in patients with FCHL. In addition, Ang II has proinflammatory effects and appears to impair fibrinolysis in FCHL.

PP.44.36 EARLY EFFECT OF SMOKING CESSATION ON ARTERIAL STIFFNESS AND ADIPOSITY INDICES

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Objective: Smoking has been associated with increased arterial stiffness and low serum levels of adiponectin (APN), an adipocytokine with insulin-sensitizing, anti-inflammatory and anti-atherogenic properties. The objective of this study was to assess the early effect of smoking cessation supported by bupropion on arterial stiffness and APN levels of hypertensive individuals.

Design and method: Hypertensive smokers with no additional cardiovascular risk factors were administered 150 mg sustained-release bupropion twice daily for 9 weeks. Quitters constituted the active group and non-quitters the control group. Arterial stiffness was assessed as carotid-femoral pulse wave velocity (PWV) measured via an automatic computerized technique (Complior; Artech Medical, Pantin, France). Sandwich enzyme-linked immunosorbent assays were employed for the measurement of serum APN and cotinine, the latter used for validation of self-reported abstinence. Blood pressure measurements were performed in the non-dominant arm using a standard mercury sphygmomanometer.

Results: Among the 102 participants (mean age 50.1±9.4 years, 51 females, Brinkman index 508.9±87.5, body mass index 27.8±4.7 kg/m2, waist circumference 97.4±12.3 cm, baseline PWV 9.5±1.4 m/s and APN 6.4±1.4 mg/L), 42 (41.2%) had quitted smoking at week 9. Quitters showed significant post-cessation decrease in PWV (mean difference from baseline -1.3±0.5 m/s, 95% CI -0.3, -2.5; p<0.05) and pulse pressure (PP, mean difference -3.0±4.4 mmHg, 95% CI -1.5, -5.1; p<0.01), while their post-cessation APN levels increased (mean difference 1.5±0.6 mg/L, 95% CI 0.6, 2.8; p<0.01). Non-quitters' PWV, PP, and APN remained unaltered. PWV change in quitters showed highly significant correlation with APN change (r=0.855, p<0.001). In a multivariate linear regression model, age (standardized beta coefficient =0.387, p=0.008), APN levels (beta= -0.277, p=0.021) and PP (beta=0.480, p=0.002) were independently associated with post-cessation PWV, explaining about half of its variance (R^2 =0.498).

Conclusions: PWV and PP appear to decrease, whereas serum APN seems to increase early after smoking cessation in hypertensive subjects. This finding may provide further insight into the mechanisms related to the detrimental effects of smoking and the benefits of quitting with respect to large artery stiffness.

PP.44.37 CORRELATIONS OF AORTIC PULSE WAVE VELOCITY WITH MARKERS OF CALCIFICATIONS IN HYPERTENSIVE PATIENTS

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Objective: Osteoprotegerin (OPG) and receptor activator of nuclear factor kappa-B ligand (RANKL) have an important role in several aspects of the processes leading to vascular calcification. The aim of this study was to evaluate the relationship between OPG and RANKL and aortic pulse wave velocity (PWV) in hypertensive patients with or without coronary artery disease (CAD).

Design and method: This study was done on a total number of 223 hypertensive patients divided into 2 groups according to the presence or absence of CAD: 140 patients with angiographically confirmed CAD and 83 patients without CAD. The patients were compared to a control group consisting of 74 healthy subjects. Aortic pulse wave velocity and augmentation index were measured using the Medexpert Arteriograph. RANKL and OPG concentrations were determined using specific ELISA tests.

Results: The values of PWV were significantly higher in hypertensive patients with CAD compared to hypertensive patients without CAD and CONTROL group (12.6±0.73 m/s vs 12.1±0.98 vs 8.6±0.62 m/s, all p<0.001). A significant positive correlation was observed between PWV and OPG (r=0.833, p<0.001) and a significant negative correlation between PWV and RANKL (r=-0.540, p<0.001). According to the findings, we evaluated the ratio between OPG/RANKL as potential diagnostic biomarker of calcification and PWV and found a significant positive correlation (r=0.541, p<0,001).

Conclusions: These findings suggest that OPG and RANKL could become valuable tools for assessment of additional risk in hypertensive patients, expressing arterial calcification associated with arterial stiffness determined by PWV.

PP.44.38 RELATIONSHIP BETWEEN QUANTITATIVE MARKERS OF ARTERIAL CALCIFICATION AND INTIMA-MEDIA THICKNESS IN HYPERTENSIVE PATIENTS

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Objective: Osteoprotegerin (OPG) and receptor activator of nuclear factor kappa-B ligand (RANKL) are important regulators of mineral metabolism in both bone and vascular tissues. The aim of this study was to evaluate the relationship between OPG and RANKL and carotid intima-media thickness (IMT) in hypertensive patients with or without coronary artery disease (CAD).

Design and method: The prospective study was conducted on a total number of 223 hypertensive patients divided into 2 groups according to the presence or absence of CAD: 140 patients with angiographically confirmed CAD and 83 patients without CAD. The patients were compared to a control group consisting of 74 healthy subjects. OPG and RANKL concentrations were determined by ELISA.

Results: The values of OPG were significantly higher in hypertensive patients with CAD compared to hypertensive patients without CAD and CONTROL group (3.9±0.48 vs 2.8±0.62 vs 1.2±0.36 pg/ml, all p<0.001). The values of RANKL were significantly lower in hypertensive patients with CAD compared to hypertensive patients without CAD and CONTROL group (0.67±0.16 vs 1±0.84 vs 2±0.11 pg/ml, all p<0.001). A significant positive correlation was observed between OPG and carotid IMT (r=0.824, p<0.001) and a significant negative correlation between RANKL and carotid IMT (r=-0.454, p<0.001). It was found a significant positive correlation (r=0.511, p<0.001) between OPG/RANKL and carotid IMT.

Conclusions: These findings suggest that modifications of OPG and RANKL associated with increased carotid intima-media thickness may be used in cardiovascular prevention to detect hypertensive patients with a higher risk to develop atherosclerosis.

PP.44.39 HIGHER GRADES OF HYPERTENSION 'PLAQUE-IN' CAROTID ATHEROSCLEROSIS

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Objective: Essential hypertension (EH) is an established risk factor for carotid atherosclerosis. The present study sought to determinecontributing risk factors for carotid plaque development in patients with newly diagnosed EH.

Design and method: A total of 756 consecutive newly diagnosed, never treated patients with EH grade 1-3 (mean age 52±13 year, 53% males) referred to the outpatient antihypertensive unit of our institution were studied in accordance to the European Society of Hypertension guidelines. Individuals with diabetes or known cardiovascular disease were excluded.All participants under went carotid ultrasound for the assessment of carotid plaque(s) presence and morphology.

Results: The prevalence of carotid plaque(s) presence was 45.6% (1, 2 and >2 plaque(s): 21.6%, 16.1% and 7.9%, respectively). The median value of the percentage of stenosis was 20% (10-30%).The prevalence of stenosis>50% was 2%.Compared to patients without carotid plaques, patients with plaques were older (48±14 vs. 57±11, p<0.001), with higher prevalence of male gender (49% vs. 57%, p=0.025), smoking (30% vs. 41%, p=0.002), metabolic syndrome (43% vs. 51%, p=0.043) and dyslipidemia (34% vs. 51%, p<0.001), higher fasting plasma glucose (95±11 vs. 97±11, p=0.003), LDL-Cholesterol (133±33 vs. 145±37, p<0.001), triglycerides (114±55 vs. 125±59, p=0.007), log hs-CRP (0.11±0.5 vs. 0.23±0.5, p=0.017) and 24-hour pulse pressure (49±8 vs. 52±9, p<0.001) and lower glomerular filtration rate (82±17 vs. 78±22, p=0.02), while they did not differ with regard to 24-hour systolic pressure (125±11 vs. 127±13, p=0.085), diastolic pressure (76±9 vs. 75±10, p=0.16) and heart rate (74±9 vs. 73±9, p=0.17). Logistic regression analysis indicatedage (OR 1.07, 95%CI 1.05-1.09, p<0.001), male gender (OR 2.5, 95%CI 1.68-3.78, p<0.001), dyslipidemia (OR 1.63, 95%CI 1.11-2.41, p=0.014), smoking (OR 1.6, 95%CI 1.07-2.43, p=0.024) and hs-CRP (OR 1.11, 95%CI 1.04-1.18, p=0.003) as independent predictors of carotid plaque(s) presence. However, independently of age, gender, smoking status, fasting plasma glucose and LDL levels, grade 3 EH was associated witha 2-fold higher risk for the presence of plaque(s) compared to grade 1 EH.

Conclusions: Higher blood pressuredoubles the risk for carotid plaque development, independently of traditional cardiovascular risk factors.

PP.44.40 THE VASCULAR ENDOTHELIAL GROWTH FACTOR (VEGF). SOLUBLE VEGF RECEPTOR 1 (SFLT-1) AXIS IS DISTURBED IN EARLY DIABETIC NEPHROPATHY

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Objective: Vascular endothelial growth factors and its receptors have been implicated in the development of microvascular complications in patients with diabetes mellitus type II. However, their role in early diabetic nephropathy has not been clearly defined.

Design and method: Data from ROADMAP (Randomised Olmesartan And Diabetes MicroAlbuminuria Prevention) study, which included 4447 patients with a median follow up of 3.2 years were used. 2430 out of 4447 patients participated in a marker sub-study and half of those were treated with olmesartan. 190 patients in the marker sub-study had established microalbuminuria and 65 developed microalbuminuria after first sampling. A control group consisting of 65 patients was generated by matching for age, sex, BMI, HbA1c, duration of diabetes, baseline urinary albumin creatinine ratio (UACR), baseline GFR, systolic blood pressure and LDL. Serum VEGF and sFlt-1 levels were compared in the three groups. Urine VEGF levels were compared in patients with new onset microalbuminuria (MA) and in controls only.

Results: sFlt-1 was lower in controls than in patients with established or new onset MA (55.3 ± 8.1 vs 108.4 ± 4.0 and 110.8 ± 5.7 vs.; p<0.0001 vs. the other groups). The sFlt-1 levels showed only a weak correlation with the baseline UACR levels (r=0.03). Serum and urine VEGF did not distinguish between patients who developed MA and controls. Olmesartan did not have an effect on serum VEGF and sFlt-1 levels.

Conclusions: sFlt levels are higher in type II diabetics who have established microalbuminria and those that will develop microalbuminuria. Values are not affected by previous treatment with an angiotensin receptor blocker. The clinical implications of these findings must be further investigated.

PP.44.41 ALTERATIONS IN A PANEL OF SERUM BIOMARKERS PRECEDE THE DEVELOPMENT OF MICROALBUMINURIA (MA) IN PATIENTS WITH DIABETES MELLITUS TYPE II

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Objective: The aim of the study was to investigate if specific serum biomarkers indicative of vascular inflammation and endothelial dysfunction can predict the development of microalbuminuria in patients with diabetes mellitus type II.

Design and method: Data from ROADMAP (Randomised Olmesartan And Diabetes MicroAlbuminuria Prevention) study, which included 4447 patients with a median follow up of 3,2 years were used. 2430 out of 4447 patients participated in a marker sub-study and half of those were treated with olmesartan. 65 patients in the marker sub-study developed microalbuminuria after first sampling (cases). A control group was generated by matching for age, sex, BMI, HbA1c, duration of diabetes, baseline urinary albumin creatinine ratio (UACR), baseline GFR, systolic blood pressure and LDL. The inflammatory biomarkers sTNFR-I, sTNFR-II, ST2 (IL-33 receptor), the anti-inflammatory marker C1qR1 (receptor of C1q) and the endothelial stress markers Copeptin and Thrombomodulin were compared in baseline samples of cases and controls. Results of the univariate analysis are presented here.

Results: The inflammatory cytokine sTNFR1 did not differ between future MA patients and controls (1436±86 vs. 1569±66 pg/ml, p=0.246). The inflammatory markers sTNFR-II and soluble ST2 (IL-33 receptor) were significantly increased in patients with future microalbuminuria. The respective mean values were 3183±145, vs. 2858±90 pg/ml (p =0.047) for sTNF-RII and 14450±800 vs. 12464±568 pg/ml (p=0.039) for sST2. The anti-inflammatory marker C1qR (receptor of C1q) was significantly reduced in patients with future microalbuminuria. The mean values in both groups were 34±2.1 vs. 28±2.0 ng/ml (p=0.047). The endothelial stress markers Thrombomodulin and Copeptin were significantly increased in patients with future MA. Especially the results for copeptin were highly significant. The respective mean values in both groups were 4415±161 vs. 4067±96 pg/ml (p=0.054) for Thrombomodulin and 15±1,1 vs. 11±0.48 pg/ml (p=0.003) for Copeptin.

Conclusions: The alterations of serum inflammatory and endothelial stress markers prior to the development of microalbuminuria in patients with diabetes type II, adds to the evidence supporting its significance as a biomarker reflecting vascular inflammation and early vascular damage.

PP.44.42 ALISKIREN AND CAROTID INTIMA-MEDIA THICKNESS IN HYPERTENSIVE PATIENTS: THE EXPERIENCE OF A SPECIALIZED HOSPITAL AMBULATORY

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Objective: Anti-hypertensive drugs are similar in their capability of controlling BP; they may differ in the way they can protect patients against organdamage. The aim of this study is to examine whether Aliskiren, a direct renin inhibitor would influence structural vascular changes beyondthe effects of blood pressure reduction.

Design and method: Caucasian hypertensive patients with Hypertension grade 2 since 3 years with no other cardiovascular risk factorsand treated either with Aliskiren 150 mg.day or 300 mg.day (As) or with Atenolol 100 (group A) were recruited. Echodoppler test were performed to measure carotid medium-intima thickness at the beginning and after 36 months. These tests were performed by thesame operators who were blinded to previous values and therapy. Bloodpressure (BP) were monitored on a monthly basis by patients' general practitionersand the onset of any cardiovascular risk factors were checked onsixty monthly basis.

Results: One hundred and sixty-two patients were enrolled, aged 28-69, 44 were female. 82 PTS (27 female) belonged to group As and the remaining 80 patients (17 female) belonged to group A. With similar reductions in blood pressure, intima-media thickness was reduced below 0,6-0,9 mm in 81 of 82 PTS group As, no in group A.

Conclusions: Both drug therapy, Aliskiren 150 or 300 mg, once a day and Atenol are good in controlling and maintaining BP values. The A favourable effects on parietal thickness suggest that angiotensin II mediates structuralvascular changes, beyond the effects of blood pressure. This may be important in the prevention of cerebrovascular events.

PP.44.43 INDICES OF RESISTANCE OF RENAL ARTERIES PREDICTORS OF SYSTEMIC VASCULAR DAMAGE IN HYPERTENSIVES

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Objective: To demonstrate that the increase in renal resistant index (RI) can be considered predictive of severe alterations in arterial hypertension. In the literature, there are conflicting data on the possible relationship between increased IR and the intima-media thickness supraaortic vessels. New studies have shown that carotid IMT should be increasing with the progressive deterioration of renal function. The aim of our study was to evaluate, in hypertensive patients the possible correlation between IR and IMT.

Design and method: we enrolled and followed for 48 months 364 patients with arterial hypertension grade 2 (aged between 30 and 64 years), treated only with ace - inhibitors or angiotensin 2 inhibitors . Everyone has been practiced creatinine clearance (CC), Doppler ultrasound of the SAT and renal artery at time 0 and after 48 months.

Results: Patients with IMT >=0.9 mm showed both higher values of IR in the totality of the population studied (< 0.001), both in the subgroups with and without CHD (in both cases p >0,01). A close correlation was found between IMT and IR both in the whole study population (r = 0.43, p <0.001) and in the subgroups (r = 0 42 , p< 0.001) and without CKD (r = 0.039 ; <p0.001).

Conclusions: our results show a strong correlation between carotid IMT renal IR , the IR seem to confirm that , beyond its purely prognostic value of renal failure may be considered a spy of systemic vascular changes.

PP.44.44 ASSOCIATION OF APOLIPOPROTEIN B/ APOLIPOPROTEIN A-I RATIO WITH RAISED CAROTID INTIMA-MEDIA THICKNESS: MARKER OF SUBCLINICAL ATHEROSCLEROSIS IN PSORIASIS PATIENTS

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Objective: Psoriasis patients are at increased risk of cardiovascular diseases (CVD), including atherosclerosis. Previous studies have shown that measurement of serum apolipoprotein may help in prediction of cardiovascular disease, however association between apolipoprotein and carotid intima media thickness (CIMT) has not been studied in detail. The aim of this study was to measure CIMT and estimate its relationship with apolipoprotein B/apolipoprotein A-I ratio in patients of psoriasis.

Design and method: Serum lipid profile and apolipoprotein (apo A-I and apo B) were measured in 150 (75 male and 75 female) psoriasis patients and age-sex matched healthy controls recruited for the study. Carotid intima-media thickness and carotid plaques were simultaneously measured by carotid sonography. The75th percentile values used to determine high risk values for apo B, apo B/apo A-I ratio and mean CIMT were 1.2g/l, 0.73 and 0.70mm respectively.

Results: Prevalence of patients with raised CIMT was higher among patients with apoB/apoA-I ratio exceeding 0.73 as compared to those with ratio less than 0.73 (35% vs 16%, p< 0.001). We found that serum apoB (P < 0.05) and apoB/apoA-I ratio (p < 0.001) significantly correlated with raised CIMT in psoriasis patients. By multivariate regression analysis, we found that increased apoB/apoA-I ratio was associated with raised CIMT (p < 0.001) even after inclusion of other conventional cardiovascular risk factors.

Conclusions: The study shows that apoB/apoA-I ratio is associated with raised intima-media thickness and can be considered as a predictor of subclinical atherosclerosis in patients of psoriasis.

PP.44.45 EVOLUTION OF CAROTID INTIMA-MEDIA THICKNESS IN DIABETIC PATIENTS

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Objective: Was to evaluate carotid intima-media thickness (cIMT) and carotid injury and its progression with age in patients with diabetes in comparison with hypertensive patients and a control group.

Design and method: A cross sectional study was done between 2010 and 2014 on a population of 732 patients with age between 30 and 80 years, of which 314 (42,9%) diabetics, 267 (36,6%) hypertensives and 151 (20,6%) in the control group. Clinical, paraclinical data, carotid IMT and risk factors were analysed.

Results: The difference of cIMT between the control group and diabetics was 0.096 mm (CI 95%, 0.056-0.134), between the control group an hypertensives 0.052 mm (95% CI, 0.021-0.087) and between diabetics and hypertensives 0.041mm (95% CI, 0.011-0.073). After adjusting these differences for age, multiple liniar regression analysis documented a cIMT year increase of 0.005 mm in diabetics, 0.006 mm in hypertensives and 0.0045 mm in the control group. cIMT correlated in diabetics positively with male gender (p=0.01), age (p=0.006), hypertension (p=0.01), triglycerides (p=0.027) and inversely with HDLc (p<0.05). The incidence of carotid damage (CIMT greater than 0.9 mm and/or presence of atherosclerotic plaques) was greater in diabetics (88 cases, 28%) than in hypertensives (45 cases, 16.8%) and in the control group (7 cases, 4.6%).

Conclusions: CIMT was greater in diabetes than in the control and hypertensive patients, but its annual increase was greater in hypertensives than diabetics.

PP.44.46 INCREASED ARTERIAL STIFFNESS ASSESSED BY CARDIO-ANKLE VASCULAR INDEX IS AN INDEPENDENT RISK FACTOR OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION

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Objective: Arterial stiffness is an important risk factor of left ventricular diastolic dysfunction. Cardio-ankle vascular index (CAVI) reflects arterial stiffness and has been used as a novel method of screening for atherosclerosis. Increased CAVI is associated with the onset or prognosis of cardiovascular disease. On the other hand, the peak early diastolic mitral annular velocity (E') measured by tissue Doppler echocardiography has been widely used for assessing left ventricular diastolic function recently. Because E' is less influenced by left ventricular preload compared with parameters of conventional Doppler echocardiography. There are few reports which clarified the relationship between arterial stiffness assessed by CAVI and left ventricular diastolic dysfunction measured by tissue Doppler echocardiography. In this study, we investigated whether CAVI is associated with E' in patients with cardiovascular disease.

Design and method: From January 2008 until September 2013, we investigated 432 subjects with cardiovascular disease who were hospitalized in Kagoshima University Hospital, Japan. Among 432 patients, 72% of the subjects were male. Average age was 67 ± 11 years. All patients were performed CAVI. Left ventricular end-diastolic dimension (LVDd) and left atrial dimension (LAD) were measured by echocardiography. E' was assessed by tissue Doppler echocardiography.

Results: Measurements of echocardiography showed that average LVDd was 49.6 ± 7.7 mm, LAD was 39.9 ± 6.2 mm and E' was 5.47 ± 1.98 cm/sec. Average CAVI was 8.5 ± 1.3. Linear regression analysis showed that age (R=-0.381, P<0.0001), LVDd (R=-0.185, P<0.0001), LAD (R=-0.187, P<0.0001) and CAVI (R=-0.281, P<0.0001) negatively correlated with E'. E' did not correlate with systolic and diastolic blood pressure. Multiple regression analysis demonstrated that age (P<0.0001), LVDd (P<0.001) and CAVI (P<0.01) independently correlated with E'.

Conclusions: Increased arterial stiffness assessed by CAVI is an independent risk factor of left ventricular diastolic dysfunction measured by tissue Doppler echocardiography in patients with cardiovascular disease. CAVI is a useful non-invasive method to assess arterial stiffness and increased CAVI predicts left ventricular diastolic dysfunction.

POSTERS' SESSION

POSTERS' SESSION PS45

PUBLIC HEALTH

PP.45.01 HEALTH EDUCATION OF HYPERTENSION ON DRUG TREATMENT. THE INFLUENCE OF DEPENDENCY

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Objective: Through the high blood pressure patients health education, improve the high blood pressure patients with high blood pressure all aspects of knowledge, improve hypertension patients healed at the medical behavior, improve the patients with high blood pressure drug dependency, and ultimately improve the quality of life of patients with high blood pressure .

Design and method: The table of random number method, in May 2012 to October in LAN Zhou university second hospital of 200 cases of high blood pressure patients were randomly divided into the experimental group and the control group ,Each group of the 100 cases . The study group with collective knowledge teaching, multimedia demonstration, combined with individual talk, follows up, medication guide, daily life education guidance, etc; The comparison group issued only hypertension information, without any guidance, self-management. After two months follow-up, for drug dependency evaluation In the intervention respectively before and after the intervention follow-up ,the Morikis recommended evaluation of essential hypertension patients medication compliance of four questions .

Results: The experimental group of drug treatment dependency raised from 76% to 96%,;the control group drug treatment dependency raised from 76% to 86%,and the front life style population proportion of low salt,weight-control,exercises,smoking cessation and temperance raised respectively from 7.0%,8.0%,10.0%,11.0% to 38.0%,29.0%,66.0%,47.0%,(P<0.05).

Conclusions: The health education model that professional doctors conducted face to face talk to hypertension patients was successful. It enhanced the conscious of self-care, changed the unhealthy life style, and improved the treatment compliance, then finally resulted in effective anti-hypertension effect.

PP.45.02 SALT REDUCTION INTERVENTION TRIAL TO PREVENT CHRONIC DISEASES IN THE MUANG DISTRICT, CHAING RAI, THAILAND: BASIC CHARACTERISTICS AT BASELINE

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Objective: To estimate daily salt intake and basic characteristics of participants with high salt intake among those with a high cardiovascular disease (CVD) risk in northern Thailand.

Design and method: This study was a cluster randomised trial (February 2012 to March 2013) conducted among 793 community-dwelling participants with Framing general CVD risk scores >15%. All patients had visited diabetes or hypertension clinics at health centres in the Muang district (Chiang Rai, Thailand). We performed descriptive analysis of baseline data and used an automated analyser to estimate mean 24-hour salt intake in urine collected overnight for 3 days. Participants with daily salt intake >=10 g were defined as the "high salt intake group" based on median daily salt intake.

Results: Mean age and proportion of males were 65.2 years and 37.6% in the high salt intake group (N=431), and 67.5 years and 42.7% in the low salt intake group (N=362), respectively (P=0.01, P<0.01). Systolic and diastolic blood pressures did not differ significantly between groups. The high salt intake group comprised more patients with family histories of hypertension, antihypertensive drug use and exercise frequency (>=2 times weekly). In contrast, the high salt intake group had a lower ideal body mass index (18.5-24.9) and lower awareness of high salt intake compared to the low salt intake group. High salt intake participants with lower awareness of their high salt intake were younger and more often showed family histories of hypertension, relative to those with more awareness.

Conclusions: Descriptive analysis of baseline data showed characteristics associated with high salt intake, which included high levels of hypertensive medication, family histories of hypertension, and low awareness of high salt intake. Among the high salt intake group, those with low awareness of high salt intake were likely to have higher family histories of hypertension. Our data indicated that families often share lifestyles involving high salt intake, and discrepancies between actual salt intake and awareness of high salt intake may represent a need for salt reduction. Awareness of actual salt intake should be improved for each family.

PP.45.03 HYPERTENSIVE WOMEN ARE CHARACTERIZED BY POOR QUALITY OF LIFE COMPARED TO HYPERTENSIVE MEN

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Objective: Females and the elderly, demonstrate low scores of health-related quality of life (H-rQoL) as far as coronary artery disease is concerned. We assessed the hypothesis that age and gender have an influence on H-rQoL in the setting of essential hypertension (EH).

Design and method: We studied 154 subjects with untreated uncomplicated stage I-II EH (aged =54.9 ± 8 years, male =78 female =76 , office BP=152/92 mm Hg).Both female and male group of patients were matched for age, office BP and lipid parameters. The validated Greek version of the Short Form 36 (SF-36) General Health Survey questionnaire was administered to all participants. The eight subscales were further grouped into two summary scales: the physical component summary (PCS) and the mental component summary (MCS). Non-parametric Mann-Whitney ans Spearmann tests were performed.

Results: Females scored significantly lower in the physical functioning dimension when compared to men (Table). This decline in the female group is negatively correlated to age (r = -0.328, p=0.002).

Table. Comparison of SF-36 scores among male and female hypertensives.

SF-36 SCALES	MALE (n=78)	FEMALE (n=76	P-VALUE
Physical functioning	57.54	44.78	0.02
Role physical	49.95	50.14	0.71
Bodily pain	53.94	45.78	0.07
General health	54.28	47.78	0.29
Social functioning	52.65	48.32	0.42
Mental health	53.22	48.15	0.38
PCS	54.72	45.37	0.11
MCS	52.44	49.27	0.54
Total SF-36 score	53.34	47.46	0.31

Conclusions: Older women may represent a more vulnerable group of hypertensives, as far as their physical functional capacity is concerned. Quality of life has hitherto been underestimated but should be more intensively considered in parallel to hypertension control.

PP.45.04 EASTERN EUROPEAN HYPERTENSIVE IMMIGRANTS ARE CHARACTERIZED BY POOR HEALTH-RELATED QUALITY OF LIFE IN COMPARISON TO NATIVE HYPERTENSIVES

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Objective: Much of the variance in hypertension-related sequelae across ethnic groups, is highly related to deficits in accurate health-related data.We sought to evaluate the burden of migration on health-related quality of life (H-rQoL) in the setting of essential hypertension (EH).We hypothesised that immigrants would indicate lower scores in the most dimensions of H-rQoL than natives, reflecting differences in social-economic status.

Design and method: We studied 67 Eastern European immigrants with newly diagnosed untreated stage I-II EH (aged 51±15 years, 35 male, office blood pressure (OBP)=159/92 mm Hg), who immigrated to Greece within the previous two years and 61 hypertensives natives matched for age, gender and OBP. The validated Greek version of the Short Form 36 (SF-36) General Health Survey questionnaire was administered to all participants. The subscales were further grouped into two summary scales: the physical component summary (PCS) and the mental component summary (MCS). Non parametric Mann-Whitney tests were performed.

Results: Hypertensive immigrants scored significantly lower in all dimensions of SF-36 when compared to natives. (Table 1)

Table 1. SF-36 SCORING

SF-36 SCALES	IMMIGRANTS	NATIVES	P-VALUE
Role physical	39±13	68±24	0.001
General health	41±15	67±26	0.05
Vitality	33±12	72±27	0.001
Social functioning	28±12	75±26	0.001
Role emotional	31±13	74±28	0.001
Mental health	32±12	74±27	0.001
PCS	41±16	69±26	0.05
MCS	31±14	74±27	0.001
TOTAL SF-36	35±17	74±27	0.001

Conclusions: Immigration process and resettlement experience jeopardizes H-rQoL in the setting of EH. It is crucial for primary health care units and other social services to conduct screening programmes for hypertension and its impact to the psychological well-being of the migrating people.

PP.45.05 PREVALENCE OF ARTERIAL HYPERTENSION AND MAJOR CARDIOVASCULAR RISK FACTORS VARYING WITH ACCESS TO MEDICAL SERVICES IN A ROMA ETHNIC COMMUNITY. DATA FROM THE ROMA STUDY

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Objective: To evaluate the prevalence and clinical correlates of arterial hypertension (HTN) and major cardiovascular (CV) risk factors varying with access to medical services (AMS) in a Roma ethnic community. As this population is known to suffer from severe CV diseases, we aimed to show how AMS may influence life style and adherence to therapy in this group.

Design and method: 806 Roma adult subjects (age range 18-83 years) regardless of medical history were included between 2012 and 2013. Four hundred patients came from a low-AMS community and 406 came from a better-AMS community. For each subject we recorded demographic and anthropometric data, presence of major CV risk factors and blood pressure measurements using adequate cuff size. We defined visceral obesity as waist circumference >88 cm in females, >102 cm in males. Diabetes mellitus was considered as fasting glycemia >126 mg/dl or known diabetes.

Results: See table.

Parameters	Low-AMS (A)	Better-AMS (B)	p (A vs B)
Access to medical services, %	50.37	49.63	ns
Arterial hypertension, %	47.6	52.3	ns
Controlled HTN, %	34.11	55.63	0.01
Newly-diagnosed HTN, %	31.78	20.42	0.03
Awareness HTN, %	68.22	79.58	0.03
Drug-treated HTN, %	52.71	59.15	ns
Diabetes mellitus, %	33.33	27.46	ns
Dyslipidemia, %	62.02	85.92	0.01
Visceral obesity, %	70.54	71.83	ns
Obesity (BMI>30), %	56.59	51.41	ns
Smoking, %	45.74	46.48	ns

Conclusions: These groups seem to be equally affected by HTN. However, newly diagnosed cases, uncontrolled HTN and low adherence to drug-therapy were significantly more frequent in subjects with low AMS, while HTN control and awareness was significantly higher in the better-AMS group (p 0.03). The prevalence of some major CV risk factors such as smoking or obesity (especially visceral) was similar between the two groups, while dyslipidemia was more frequent among subjects with better AMS. These results may form the basis of future health or educational programs specially designed for this population.

PP.45.06 SYMPTOMS OF ANXIETY AND DEPRESSION ACROSS ADULTHOOD AND BLOOD PRESSURE IN LATE MIDDLE AGE: THE 1946 BRITISH BIRTH COHORT

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Objective: Previous studies testing the hypothesis that symptoms of anxiety and depression increase blood pressure (BP) levels show inconsistent and limited findings. We examined the association between those symptoms across adult life and BP in late middle age.

TABLE 1. [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 2. [illegible]

[illegible]	n (%)	Model 1	Model 2	Model 3	Model 4	Model 5
[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
p-value		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Design and method: Using data from 1683 participants from the MRC NSHD, we investigated associations between symptoms of anxiety and depression at ages 36, 43, 53 and 60-64 and systolic and diastolic BP at age 60-64. Multivariable linear regression was used to examine the effect on BP of symptoms of anxiety and depression at each age separately and as a categorical cumulative score based on the number of times an individual was classified as a 'case'. Models were adjusted for gender, BMI, educational attainment, socio-economic position, heart rate, lifestyle factors and antihypertensive treatment.

Results: Table 1 presents the general characteristics of the 1683 study members (52.4 % women) at age 60-64 by lifetime symptoms of anxiety and depression status.In table 2, the unadjusted model (model 1) showed that study members reporting case-level affective symptoms at 1 to 2 time-points had lower systolic BP at age 60-64 than those never meeting case criteria, as well as study members meeting criteria at 3 to 4 time-points (p-value for trend 0.001).After full covariate adjustment (model 5), we observed a clear inverse dose-response for lower systolic BP in relation to frequency of affective caseness suggesting a cumulative impact of anxiety and depression on systolic BP across adulthood (p-value for trend 0.022). Gender and BMI had a large impact on the estimates while not other confounders. Potential mediators such as heart rate and lifestyle behaviours had little impact on the association. A similar but weaker trend was observed for diastolic BP.

Conclusions: A cumulative effect of symptoms of anxiety and depression across adulthood results in lower systolic BP in late middle age that is not explained by lifestyle factors and antihypertensive treatment. Mechanisms by which mood may impact BP should be investigated.

PP.45.07 BUILDING COMMUNITY CAPACITY: ENGAGING INDIVIDUALS IN KNOWLEDGE-TRANSFER ON THE DETERMINANTS OF HYPERTENSION

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Objective: In Cape Breton, Nova Scotia hypertension is a major health problem. Almost one-third of the population over the age of twenty have hypertension and in people with diabetes rates increase to 70%. It is not known what people in Cape Breton know about hypertension and its determinants. The relationship between sleep quality and hypertension is also not known.
The purpose of this study was to assess: 1) the knowledge of participants of the determinants of hypertension; 2) participants' understanding of the relationship between sleep quality and hypertension and 3) to determine whether providing education on the determinants of hypertension leads to lifestyle changes.

Design and method: Participants were recruited from four communities in Cape Breton over a six-month period. Participants' knowledge of the determinants of hypertension and their understanding of the relationship between sleep quality and hypertension was assessed by a short questionnaire. Following completion of the questionnaire, education was provided on lifestyle behaviors for maintaining or achieving optimal blood pressure control. The participants were contacted at two-weeks and four-weeks following the education session to determine lifestyle changes, if any.

Results: Seventy-six individuals participated in the study, of which fifty-two were females and twenty-four were males. Descriptive statistics were carried out to characterize the study population. Responses to the questionnaire revealed 27.3 % of participants were aware that smoking was a determinant, 14.1 % associated a lack of physical activity with hypertension, 22.4% recognized a diet high in sodium was a determinant, 26.4% associated stress with hypertension and 7.6% of participants viewed poor sleep quality as a contributing factor to hypertension. Participants also demonstrated very poor understanding of the relationship between sleep quality and hypertension. Although self-reporting, 56% of participants reported implementing behavior changes for maintaining or achieving optimal blood pressure control.

Conclusions: Knowledge about the determinants of hypertension is poor in Cape Breton. The relationship between sleep quality and hypertension is also poorly understood. Community-based prevention and intervention programs for achieving or maintaining optimal blood pressure control must be developed.

PP.45.08 PROFILE OF THE ADULT ROMANIAN FEMALE HYPERTENSIVE

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Objective: Description of epidemiological features of arterial hypertension in Romanian adult female population.

Design and method: Adult females included in the national representative SEPHAR II survey were analyzed in terms of socio-demographic characteristics, cardiovascular risk factors, blood pressure and anthropometric measurements, subclinical target organ damage, established target organ disease, total cardiovascular risk, hypertension awareness, treatment and control.
Arterial hypertension, blood pressure control and total cardiovascular risv were defined according to the 2013 ESH-ESC Guidelines.
The profile of the Romanian female hypertensive was build using the mod of every above mentioned target variables.

Results: Between October 2011 –March 2012, 1038 adult females were included in SEPHAR II study, 438 of them being hypertensive (42.2%).
The majority of hypertensive women lives in urban area (61.9% vs. 38.1%) and associate other cardiovascular risk factors: dyslipidemia (80.8%), sedentary lifestyle (72%), visceral obesity (71,6%), metabolic syndrome (59%), family history of cardiovascular disease (25.8%), diabetes mellitus (18.7%), smoking (12%).
Of all hypertensive women, 10.3% were newly diagnosed with hypertension (107 subjects), while 31.9% of women were aware of their disease.
Regarding treatment of hypertension, 66.9% were receiving treatment, but only 23.5% attained blood pressure targets.
The majority of hypertensive women were receiving a combination of two hypertensive drugs.
The most frequent used antihypertensive drugs were: diuretics (61.4%), ACEI (58%), beta blockers (53.9%), calcium channel blockers (23.9%), sartans (14.3%), central acting antihypertensive drugs (0.3%).

Conclusions: The majority of hypertensive women in Romania lives in urban areas, and a large proportion of them associate other cardiovascular risk factors, the most frequent being dyslipidemia.
Most of the hypertensive women are aware of their disease, they receive antihypertensive drugs, but they don´t reach the recommended blood pressure targets.

PP.45.09 QUALITY OF LIFE IN MENOPAUSAL WOMEN WITH HYPERTENSION

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Objective: To determine the quality of life of menopausal women diagnosed of hypertension in a health district.

Design and method: A descriptive, cross-sectional, retrospective, observational study with no control group; that is, prevalence in the area of Primary Care Zone in Tarancón (Cuenca) on menopausal women amenorrhea 12 consecutive months. 400 postmenopausal women diagnosed with MS by NCEP ATP III participated in the study, from January 2010 until the first quarter of 2011. They fulfilled the Quality of Life questionnaire SF -12 to construct variables for the study. validated for the Spanish population.

Results: The mean age of women in the study was 66.93: the onset of menopause was 48.76years. The average time in menopausal women in the study was 18.11years. Regarding the quality of life perceived by the women in the study, obtaining eight dimensions of health profile and two component summaries, physical and mental:
1. General Health 52 % had a regular health perception; although it was good for 40.5%.
2. Physical Functioning most looked very limited physically, especially at climbing stairs (46.3 %).
3. The Role limitations-Physical health interfered with work and other tasks so that 46 % of women did less work than they would like.
4. Bodily Pain was no problem for 29.5 %, and it made a little harder to perform activities in 23%.
5. Vitality over half of women had this feeling of energy only sometimes.
6. Social Functioning in 43% of women, physical or emotional problems never interfered with social life; this only happened occasionally in 22% of cases.
7. Role-Emotional emotional problems had no negative impact on daily activities in more than 60% of women.
8. Mental Health while 57.3 % showed nervousness, 76.5 % were found rarely sad.

Conclusions: The mean scores of the physical component summary PCS12 is below the Spanish population mean; this also happens for the mental component summary MCS12, exceeding the population mean in women over 65 years. Factoring by age groups, no difference in the mental component is found. However, the physical component is significantly worse in women older than.

PP.45.10 DRINKING WATER SODIUM AND HYPERTENSION: A REVIEW OF EPIDEMIOLOGICAL EVIDENCE

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Objective: Saline water intrusion into freshwater resources in coastal areas is the major impact of climate change and global sea level rise. Water resources in all the eleven Asian mega-deltas and other large deltas such as the Nile and Mississippi are vulnerable to saline intrusion. Given food is the major source of dietary sodium; epidemiological studies assessing the health effects of increased intake through water have been scanty. An investigation of the human health impacts is urgently required to adopt appropriate adaptation strategies. In this systematic review of epidemiological studies we highlight the effect of drinking water salinity, measured with sodium content, on hypertension, as one of the potential health outcomes.

Design and method: We conducted a literature search using the electronic databases PubMed (National Library of Medicine 2011), Scopus (Elsevier 2011) and Web of Science (Thomson Reuters 2011). We identified the journal articles published in English since 1960.

Results: Of the 16 studies analysed, majority were conducted in children aged between 8-18 years. One study was conducted with young infants (< 2months), two other included population older than children and one study was conducted among pregnant mothers. Besides cross-sectional and ecological study (n=12), experimental (n=2) and prospective or retrospective follow-up (n=2) designs were adopted in the research. Seven cross-sectional studies showed statistically significant positive association between water sodium content and mean increase in blood pressure (1.8-4.0mmHg). Evidence from follow-up study (n=1) and experimental research (n=1) further supported this relationship.
In all the studies the level of sodium in drinking water ranged between (~100- ~400mg/L), except the study of coastal areas of Bangladesh where maximum level of sodium in water was 12.8g/L during dry season. And this was linked with a higher proportion of pregnant mothers with hypertension during dry (12%) than wet season (5%).

Conclusions: Our review of epidemiological studies suggests a potential effect of water sodium on human blood pressure despite methodological drawbacks. By study design, the evidence of association from cross-sectional studies is considered weak. Further investigation through hierarchical study design of prospective or retrospective type is warranted.

PP.45.11 PSYCHOLOGICAL DISTRESS PREDICTS THE DEVELOPMENT OF HYPERTENSION OVER 5 YEARS IN A BLACK POPULATION WITH OPTIMAL BLOOD PRESSURE

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Objective: The alarming increases in the prevalence and incidence of hypertension in black populations have devastating consequences evidenced by disturbing cardiovascular morbidity and mortality rates. This reality compels the evaluation of a wide range of potential exposures that may lead to the development of hypertension. We assessed psychological distress in a black population with optimal BP (<=120/80 mmHg) and how it relates to a 5-year change in BP.

Design and method: In an epidemiological study including 2021 Africans aged >35 yrs, we identified 478 individuals with optimal BP. Psychological distress was measured in 157 of these participants using the Kessler six-question K6 screening scale (implementing a 1-5 rating scale per item) adopted by the WHO and designed to monitor population prevalences of non-specific psychological distress. The K6 is known to be sensitive for discriminating between cases and non-cases of serious mental illness.

Results: Over 5 years, 17 of the 158 participants died and 34 were lost to follow-up. From the remaining 106 participants with optimal BP at baseline 17% manifested K6 scores exceeding the cut-off of 19, and 22.6% were hypertensive at follow-up.

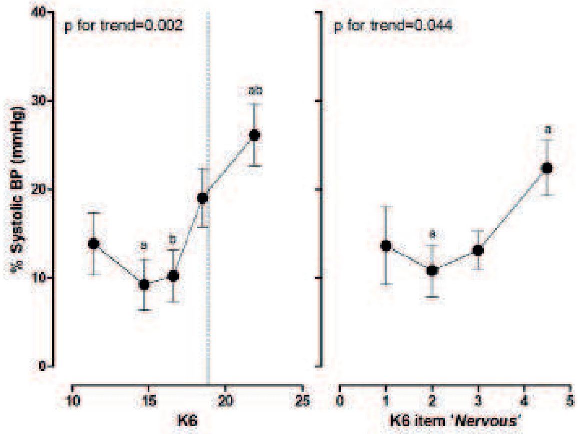

Fig. 1. Percentage change in SBP according to K6 measures of psychological distress.

In multivariable-adjusted analyses, the 5-year percentage change in SBP was independently explained by K6 (β=0.28; p=0.007). In multivariable adjusted Cox regression analyses, psychological distress predicted hypertension (for K6 the hazard ratio was 1.13 [1.01–1.30] and for the question on being nervous over the past month the hazard ratio was 1.93 [1.19–3.14]). Regression models were adjusted for baseline blood pressure, waist circumference, fasting glucose, high-density lipoprotein-cholesterol, γ-glutamyl transferase and HIV status.

Conclusions: Psychological distress as measured with the K6 predicted the elevation of SBP over 5 years in a black community. This result emphasises the potential usefulness of low-cost screening instruments in identifying individuals at risk for the development of cardiovascular disease in low-resource settings.

PP.45.12 EPIDEMIOLOGICAL STUDY OF HYPERTENSIVE EMERGENCIES AND URGENCIES: DATA FROM THE CARDIOLOGY DEPARTMENT OF A GREEK DISTRICT GENERAL HOSPITAL

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Objective: Arterial hypertension is a highly prevalent condition and evidence based recommendations guide diagnosis and management. One aspect of its clinical spectrum, hypertensive urgencies and emergencies, remains underrepresented in these guidelines partly due to the lack of epidemiological data. We sought to define the prevalence and study patient characteristics of hypertensive urgencies and emergencies in the Emergency Department of our hospital over a period of one year.

Design and method: We studied the records of 1109 patients who presented to the Cardiology Branch of our hospital's Emergency Department (ED) in the year 2010. We defined hypertensive urgencies (HU) as asymptomatic elevations of systolic blood pressure (SBP) >180 mmHg and/or diastolic (DBP) >120 mmHg and hypertensive emergencies (HE) as large BP elevations associated with clinical evidence of organ damage (hypertensive encephalopathy, stroke, acute pulmonary edema, acute renal failure).

Results: The prevalence of HU and HE was 14.9%. Our patients were mostly female (53%). Mean patient age was 71 years. Patients classified in the HU group (83.8%) had a mean BP of 185/105 mmHg; the most common reason for the ED visit was abnormal BP reading (41%). Patients classified in the HE group (16.1%) had a mean BP of 195/110 mmHg; the most common form of organ damage was acute cardiac failure (32%). 3% of the patients did not have a prior history of hypertension. In 92% of cases a specific cause for the BP elevation could be identified; most commonly non adherence to dietary and drug therapy. All HE patients and 22% of the HU patients were admitted to the Cardiology Department while the rest were admitted to the Short Stay Ward of our ED. All of the patients underwent serial laboratory testing, electrocardiograms and echocardiographic examinations.

Conclusions: Hypertensive urgencies and emergencies are a common clinical problem for the hospital based cardiologist. Such patients require hospital admission and in some cases prolonged stay and thus utilize a significant part of healthcare resources. It is speculated that many of these events could have been prevented through better patient education or adherence to treatment.

PP.45.13 GENDER RELATED HOSTILITY IN NEWLY DIAGNOSED ESSENTIAL HYPERTENSION

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Objective: A growing body of evidence indicate the implication of hostility in the elicitation and course of hypertension, however the exact nature of this phenomenon is poorly understood especially concerning the gender aspect. Taking into account this caveat the present study focuses to investigate the gender related hostility in newly diagnosed hypertension.

Design and method: The study population consisted of 107 newly diagnosed hypertensive Patients, 61 males (mean age=48.9±9.7) and 46 females (mean age=50.7±10.9) All subjects underwent 24-hour ambulatory blood pressure monitoring (ABPM) (Spacelabs 90207) in order to establish the diagnosis of hypertension and to exclude white coat hypertension. The subjects were measured on a working day and were instructed to perform as usually.
Exclusion criteria were current or recent use of medications including psychiatric and antihypertensive drugs, as well as the diagnosis of any systemic disease or psychiatric disorder.
In order to assess the hostility status all subjects completed the Hostility and direction of Hostility Questionnaire (HDHQ) which presents seven biologically-based independent dimensions of hostility. Acting out Hostility/Critic to the Others/Delusional-deranged Hostility/Self Critic/Guilt/Introversion-Extroversion and Direction.
The SPSS statistical package was used to store and analyse the data.

Results: There were not significant differences between the two groups concerning baseline characteristics as well as blood pressure measurements (office and ambulatory). Analyses revealed that male subpopulation as compared to the female one exhibited statistically significant increase regarding the urge to act out hostility(p= 0,014),an increasing introversion status(p=0,019), and they showed statistically increased the self rated self criticism (p= 0,002) .On the other hand the female subpopulation demonstrated an increased guilt dimension (p=0,027) compared to the male one. Finally, concerning the direction of hostility a clear dominance of the male population has been noticed (p=0,001).

Conclusions: The study provides further evidence indicating the gender related hostility differences between newly diagnosed hypertensive patients and this linkage might deserve greater attention from diagnosticians and health professionals.

PP.45.14 GENDER DIFFERENCES AND PERSONALITY TRAITS ASSESSED BY EYSENCK PERSONALITY QUESTIONNAIRE IN NEWLY DIAGNOSED HYPERTENSION

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Objective: There is growing evidence suggesting gender differences in essential hypertension explained by the specific role of sex hormones. However little is known about gender differences concerning personality traits in essential hypertension.
The aim of our study was to compare extroversion, neuroticism and psychoticism in men and women suffered from essential hypertension at the time of the diagnosis.

Design and method: The study population consisted of 106 newly diagnosed hypertensive patients.
All subjects underwent 24-hour ambulatory blood pressure monitoring (ABPM) (Spacelabs 90207) in order to establish the diagnosis of hypertension and to exclude white coat hypertension. The subjects were measured on a working day and were instructed to perform as usually.
Exclusion criteria were current or recent use of medications including psychiatric and antihypertensive drugs, as well as the diagnosis of any systemic disease or psychiatric disorder
In order to assess personality traits all subjects completed the Eysenck Personality Questionnaire (EPQ) which presents three biologically-based independent dimensions of temperament: Extraversion/introversion, neuroticism/stability, psychoticism/socialization.
The SPSS statistical package was used to store and analyse the data.

Results: The sample consisted of 64 males (mean age=48.9±9.7) and 42 females (mean age=50.7±10.9). There were not significant differences between the two groups concerning baseline characteristics as well as blood pressure measurements (office and ambulatory). Hypertensive male subjects present significantly higher levels of psychoticism (p=0.003) and neuroticism (p=0.04) compared to hypertensive females. Comparison between the 2 groups regarding extroversion revealed no statistically significant difference (p=0.4).

Conclusions: The present findings suggest that personality traits play an important role concerning gender differences in newly diagnosed essential hypertension. The differences in personality traits between hypertensive men and women should be considered in the management of newly diagnosed hypertensive patients.

PP.45.15 SOCIOECONOMIC STATUS AND HYPERTENSION AMONG ADULTS IN AN URBAN SETTLEMENT (KIBERA) IN NAIROBI, KENYA

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Objective: Using education, occupation and wealth index as socioeconomic measures, we examined the association between socio economic status and hypertension among adult residents of an urban settlement (Kibera) in Nairobi, Kenya.

Design and method: We conducted a community based cross-sectional survey among 1528 adults aged 35-64 years using the modified World Health Organization STEPwise approach to surveillance of chronic disease. Multivariable log-binomial regression models were used to estimate associations between socio economic status and hypertension . Body Mass Index was included into the model as it mediates the association between socio economic status and hypertension.

Results: The prevalence of hypertension was 27% (95% CI 27-29) with substantial variations across the age groups (18%, 35% and 52 %: 35-44, 45-54 and 55-64, respectively). We observed significantly higher prevalence of hypertension among participants with no formal education 34.3% compared to those with at least some primary (24.7%), secondary (26.3%) or tertiary (25.6%) education (p<0.05). Prevalence of hypertension for unemployed participants and those engaged in casual employment (28.8%) was similar to that observed for in participants engaged in formal (26.7%) or self-employment (25.7%). Among five wealth quintiles, prevalence of hypertension was highest amongst persons in the 5th (richest) quintile 32.9%. Compared to participants with normal weights, overweight (PRR=1.4, [95% CI: 1.14, 1.73]) and obese participants (PRR=1.6, [95% CI: 1.28, 2.04] were more likely to have hypertension. The model adjusted for age and gender indicated no association between all the SES measures and hypertension. However, when BMI was added to the model, having at least primary education reduced the risk for hypertension by 17%, (RR =0.83 [95% CI: 0.69-0.99]), as compared to those who had no education at all.

Conclusions: Hypertension among the urban poor adults cannot be solely attributed to SES. Further study is needed to determine whether marginal increases in wealth are associated with adoption of habits associated with increased risk for hypertension.

PP.45.16 EVALUATION OF THE PARAMETERS OF THE EURO QOL-5D QUESTIONNAIRE UNDER NORMAL CLINICAL PRACTICE CONDITIONS ON HYPERTENSIVE PATIENTS WITH NORMAL AND ELEVATED BMI

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Objective: The epidemic of obesity and obesity-related hypertension is an important public health challenge, increasing worldwide and paralleled by growing

incidence of metabolic syndrome. The psychological impact of these chronic conditions can be very disturbing. In practical terms the functional effect of an illness and its therapy upon a patient, as perceived by the patient- could be estimated by introducing the qualitative approach of - 'Health Related Quality of Life (HRQoL).
The aim of this study is to evaluate the impact of obesity on the quality of life of hypertensive patients.

Design and method: Randomized questionnaire based cross-sectional study was conducted in the Department of Cardiology, University Hospital. 130 patients with hypertension, stratified by age, sex and BMI (normal weight 18.5–24.9; overweight 25–29.9, obese 30-35) were chosen at random. Inclusion Criteria: Patients with diagnosis of essential hypertension on regular medication for at least the last 6 months. Administration of the EuroQol-5D (EQ-5D) at the time of admission of the patient. EQ-5D comprises 5 dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has 5 levels: no problems, slight problems, moderate problems, severe problems, and extreme problems. The height, weight, smoking/non-smoking status and standard laboratory parameters were recorded.

Results: Mean age of the participants was 63.1± 12.6 years. Male/female ratio was 0.78,distribution of patients as smoker/ex smokers/nonsmoker was 20%/12.3%/67.2%. The distribution of the patients in BMI groups was 37.7%/28.5%/33.8%. Most patients had no intake of nuts in their diet. Statistically significant differences between BMI groups were seen in Usual activity (p=0.005) and Self-care (p=0.044) dimensions of EQ-5D-5L with poorest outcome in the obese. We have found significantly positive correlation between BMI and usual activities (R=0.234, p=0.001) and between age and anxiety (R=0.366 p=0.045).Mean BMI of patients with extreme problems with usual activities is significantly greater than those with lower intensity of problems. Patients with extreme anxiety tend to have higher mean age.

Conclusions: Our findings showed that individuals with obesity and hypertension had impaired QoL in terms of health, mobility, usual activity, discomfort, and anxiety. Hence, non-obese hypertensives had a better sense of overall well-being.

PP.45.17 ADJUDICATION OF DEATH IN PURE STUDY IN MALAYSIA BY VERBAL AUTOPSY

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Objective: Prospective Urban and Rural Epidemiological Study (PURE) has been conducted in Malaysia since 2007, VA is used to adjudicate death events and to classify the broad patterns of mortality occurred during the cohort follow-up.

Design and method: A group of non-medical research workers has been trained to perform VA – a systematic retrospective inquiry interviews with the family members or caretakers of imminent decedents by using a standardized and validated checklist tool. Subsequently, they were needed to describe the chronology of events, the appearance of signs and symptoms, progression of the disease, history of similar episodes in the past and the details of treatment received prior to death, if any, in a narrative VA report. To enhance accuracy, any copies of relevant supportive medical documents, if provided, were submitted together with the reports. After reviewing the VA reports, trained clinicians assigned the most likely COD based on the case definitions set by PURE study and the 10th revision of International Classification of Diseases (ICD-10).

Results: From 2009 to 2013, a total of 121 cases of death were observed in PURE cohort population of 7297 subjects. Only 23.1% deaths occurred in the hospitals and certified by medical doctors. There were 5.8% deaths (7 cases) certified by non-medical registrars as "died of old age". After adjudication for all deaths, non-communicable diseases (NCD) were the leading cause of death; representing 71.9% (87 cases) of all deaths. Cardiovascular diseases accounted for the most NCD deaths (65.5%, 57 cases), followed by cancer (28.7%, 25 cases), and diabetes mellitus (2.3%, 2 cases).

Conclusions: Cardiovascular disease is still the leading COD in Malaysia. VA is useful assessment tool to adjudicate the COD observed in PURE study. It can reduce the misclassification of COD and reduce the proportion of deaths attributed to unspecified causes.

PP.45.18 PREVALENCE OF ANXIETY, DEPRESSION, COGNITIVE IMPAIRMENT AND THEIR ASSOCIATED FACTORS AMONG MALAYSIAN ELDERS WITH HYPERTENSION IN TWO RURAL COMMUNITIES

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Objective: Hypertension is a major chronic disease which increases tremendously throughout the years especially among the elderly. It may lead to both; major and minor complications. Depression, anxiety and cognitive impairment in individuals with hypertension are associated with the poor outcomes of the disease. This study aims to determine the prevalence of depression, anxiety, and cognitive impairment among elderly patients with hypertension attending health clinics in Hilir Perak and Sabak Bernam districts besides identifying significant factors that are associated with anxiety, depression and cognitive function in the same study group.

Design and method: Cross-sectional study was carried out in six randomly selected health clinics in Hilir Perak, Perak and Sabak Bernam, Selangor of Malaysia. A total of two hundred and nine eligible consenting respondents participated in the study. The baseline socio-demographic and clinical variables were recorded through face to face interview. The anxiety and depression symptoms were assessed using validated hospital anxiety and depressive scale (HADS) while cognitive impairment function was assessed using Elderly Cognitive Assessment Questionnaire (ECAQ). Data analysis was done using x2 test, simple and multiple logistic regressions.

Results: In this study, the prevalence of anxiety, depression and cognitive impairment among the elderly patients with hypertension were 16.3%, 18.2% and 12.4% respectively. From the study, weight measurement (p=0.002) and body mass index (p=0.005) were found to be significantly associated with anxiety while cognitive impairment showed significant association with educational level (p<0.001) and age (p<0.001) of a patient.

Conclusions: Study showed relatively higher prevalence of depression rather than anxiety and cognitive impairment among the elderly hypertensive patients in Hilir Perak and Sabak Bernam districts. Our findings could help medical staff identify high risk patients with hypertension for screening of mental disorders. Education of caregivers and medical staff about old age depression may increase its rate of detection and facilitate improved treatment.

PP.45.19 SODIUM, POTASSIUM AND IODINE EXCRETION AMONG NEW ZEALAND ADULTS: IMPLICATIONS FOR PUBLIC HEALTH

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Objective: To quantify population intake of iodine, sodium and potassium in New Zealand adults to assess the best approach for a sodium reduction strategy while optimising iodine and potassium status.

Design and method: Population based survey of New Zealand Adults, using urinary excretion as an indicator of dietary intake.
Between Feb-Oct 2012, adults aged 18-64 years were randomly selected via the electoral roll from the cities of Wellington and Dunedin, New Zealand. A snowballing technique was also employed to obtain a sample size of at least 300 adults. Participants had height, weight, and blood pressure measured, and were asked to collect a 24 hour urine sample.

Results: 301 adults completed the study. Mean BMI was 26.7 kg/m2, and mean systolic blood pressure was 126mmHg. Only 23% (95% CI 18,28) of adults had an Adequate Intake of potassium, and 76% (95% CI 71,81) of adults had a sodium excretion that exceeded recommended Upper Level of intake for sodium according to relevant Nutrient Reference Values. Mean 24 hour urinary (24hU) sodium excretion was 3373 mg/day (95% CI 3208, 3539) (3833 mg/day for men and 2934 mg/day for women). Mean 24hU potassium excretion was 2728mg/day (95% CI 2611. 2844) (3005mg/day for men and 2463mg/day for women). Mean sodium potassium ratio was 1.3. The mean 24hU iodine excretion was 124 (95%CI 117,132) µg/day and 32% (95% CI 27,37) of the population had a 24hr urinary iodine excretion <100 µg/day (the Estimated Average Requirement for iodine).

Conclusions: New Zealand adults had marginal iodine intakes, high sodium intake and low potassium intake. High sodium and low potassium intakes are associated with elevated blood pressure. Public Health interventions should focus on replacing processed foods with fresh fruit and vegetables, lowering sodium concentration in processed food, and extending iodised salt use in all processed food in order to maintain iodine status.

PP.45.20 RISK FACTORS AND BLOOD PRESSURE MANAGEMENT IN XIN JIANG REGION, CHINA: A CROSS-SECTIONAL SURVEY OF 2800 HYPERTENSIVE PATIENTS

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Objective: To understand the situation regarding cardiovascular (CV) risk factors, blood pressure (BP) control and antihypertensive therapy in 4 geographic areas across Xin Jiang, China, and provide evidence for further strategies to improve hypertension management and prevent CV disease.

Design and method: 2800 primary hypertensive patients aged >=35 years selected by multistage, stratified random sampling method participated in this cross-sectional survey. All subjects completed a survey and physical examination and their medical records were reviewed. BP was measured by OMRON electronic sphygmomanometer 3 times consecutively with at least 5-minute rest before measurement for each subject. Epidata3.1 with double data entry and SPSS13.0 were used for data analysis.

Results: 1199 male and 1601 female were included in this study. Distribution across age groups were 35~44 (6%), 45~54(18%), 55~64(30%), 65~74 (32%) and >=75 (14%) years respectively. Male subjects were more likely to self-report being current smoker (24%) and consuming alcohol (strong liquor) (17%). For total survey population, the percentage of subjects with average daily edible oil consumption >25 g was 78%. The prevalence of overweight, obesity and central obesity was 42%, 32% and 85%. 78% of the study population was under antihypertensive therapy and 70% self-reported taking medication regularly. BP goal (<140/90 mmHg) was achieved in 29% of patients. Furthermore, disparities were shown among the 4 geographic areas in treatment and BP control rate. The treatment rate ranged from 93% to 52%, and BP control rate ranged from 39% to 14%, with Ku Che area being the lowest both for treatment and control rate.

Conclusions: Overall BP control rate in the 4 geographic areas across Xin Jiang is sub optimal and the prevalence of CV risk factors is high within the population with hypertension. Hypertension is the leading risk factor for CV-related and all-cause mortality and improving BP control should be a priority for health system improvement. The most common modifiable CV risk factors are overweight, obesity, as well as smoking and alcohol consumption in males: these should be the priority for further prevention strategies. Ku Che area needs the most attention.

PP.45.21 THE RELATION BETWEEN HYPERTENSION AND DIFFERENT DEMOGRAPHIC DATA AMONG HYPERTENSIVE SUDANESE PATIENTS

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Objective: This study aimed to detect the relation between hypertension and certain demographic data in Sudanese hypertensive patients.

Design and method: This study was a cross-sectional study. Data was collected from 222 hypertensive patients via structured questionnaire and analysed using Software Package for Statistical Analysis.

Results: With conform to the international pattern in which males are more affected by hypertension than females (males 66.2% , females 33.8%). The most affected age group was 41- 60 (61.1%). The most affected geographical area was the North (62.3%) followed by the East (23.9%), and the least affected region was found to be the South (6.6 %). Married subjects were more than singles constituting 89.2% of the total study population, although the study doesn't denote whether the diagnosis of hypertension was made before or after marriage. 93.2% of the study sample lived with their families. The study revealed that only 71.6% of the study sample had good compliance to treatment and scheduled physician visits, and that within those, patients with negative family history (who constituted 28.4% of the total study population) showed better compliance to treatment and scheduled follow up visits (78.04% of the patients with negative family history) than those with positive family history where 67.8% of them showed better compliance. The study shows that married patients showed better levels of compliance 73.13% than single patients. Possibly due to better access to medical service, patients originating from the north showed better compliance (70.45%) than those living in other regions of the Sudan. Disregard to origin most patients lived in desert environments (97.67% of those originating from the North and 66.66% of these originating from the East).

Conclusions: As the study shows, patients who live in stressful environments must be given information on stress and its effect in increasing blood pressure and development of hypertension and its complications, as patients originating from the East showed lower compliance, they must be targeted for health-educational programs to increase awareness. Efforts must be made to study the relation between the above mentioned variables and their contribution to the development of hypertension.

PP.45.22 BLOOD PRESSURE CONTROL AND USE OF ANTIHYPERTENSIVE MEDICATIONS AMONG PATIENTS WITH CHRONIC KIDNEY DISEASE IN PAKISTAN

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Objective: To screen adults aged >=40 years for chronic kidney disease (CKD) and assess the existing management of these patients for blood pressure control, and use of antihypertensive medications.

Design and method: It was a cross-sectional study conducted on 2873 adult participants from low- and middle-income communities in Karachi. CKD was defined as estimated glomerular filtration rate (eGFR) <60 mL/min/1.73 m² estimated by CKD-EPI Pakistan (modified CKD-EPI with correction factor, 0.686 × CKD-EPI^{1.059}) or urinary albumin to creatinine ratio >=3.4 mg/mmol. KDIGO (Kidney Disease Improving Global Outcomes) 2012 Clinical Practice Guideline based disease-specific definition of hypertension in CKD (BP >140/90 or BP >130/80 mm Hg for those with UACR < 3.4 mg/mmol and >= 3.4 mg/mmol, respectively) was used to define the condition.

Results: Among 359 (12.5%) individuals with CKD, 267 (74.4%, 95% CI: 69.5 – 78.8%) had concomitant hypertension. About 48.7% (42.6 – 54.9%) of these patients were on antihypertensive medications, and less than 20% had their blood pressure controlled to conventional target of <=140/90 mm Hg. Beta blockers were most commonly prescribed antihypertensive agent (16.7%, 95% CI: 11.9 – 21.1), followed by various combinations of antihypertensive medications (13.5%, 95% CI: 9.6 – 18.2%). Only 9.7% (6.5 – 13.9%) were on blockers of renin-angiotensin system.

Conclusions: CKD is common among Pakistani adults especially among older individuals with co-morbidities. The sub-optimal control of blood pressure and use of angiotensin converting enzyme inhibitors among patients with CKD highlight the need to integrate CKD prevention and management along with other non-communicable diseases in Pakistan.

PP.45.23 HYPERTENSION SCREENING AT HAIR SALONS: PRELIMINARY RESULTS OF A VOLUNTEER-BASED COMMUNITY HEALTH PROMOTION PROGRAM

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Objective: To assess the acceptance and usefulness of a hypertension (HTN) screening program for women set at local hair salons.

Design and method: We invited 22 local hair salon owners to participate to a HTN screening program which was limited to offering an automatic upper arm device (ESH 2002 validated) for blood pressure (BP) measurement at the waiting area. Each participating owner was provided with two devices, a display with instructions of use, patients' booklets about hypertension and anonymized questionnaires inquiring demographic, somatometric and clinical information. No option of referring to a hypertension specialist was available, though hair salon staff and patrons could contact the research team for advice and guidance unconditionally.

Results: Five hair salons, out of 19 that had initially accepted to participate, were randomly selected. A total of 1938 BP measurements were stored in the devices' memory, 683 questionnaires were completed and the research team was contacted 219 times within one month (see Table). Of note, the grossly estimated clientele would reach around 1600 women revealing the high degree of acceptance of the program, though no objective index could be calculated. In total, 15% of device measurements were above high normal values and would correspond to either newly diagnosed HNT (second measurement required) or to poorly controlled known HTN. It should be stressed that 53 women without HTN who completed the questionnaire had abnormal BP values, including the 29 women who also contacted the research team. It could be speculated that approximately 2% of women would be first diagnosed with HTN following the completion of the initial phase of the screening program.

Conclusions: Hypertension screening in the hair salon setting was proved to be conveniently applicable and well accepted both by owners and by customers and could lead to the new diagnosis of hypertension for 2% of the female clients. Further research is warranted to assess the effectiveness of the program.

	Device Measurements	Completed Questionnaires	Team Contacts
n	1938	683	119
mean SBP (mmHg)	138	145	148
mean DPB (mmHg)	76	83	85
history of HTN (n, %)	n/a	396 (58%)	63 (53%)
mean age (years)	n/a	48	44
SBP≥140mmHg and/or DBP≥90mmHg			
with hHTN (n, %)	n/a	97 (14%)	52 (44%)
no hHTN (n, %)	n/a	53 (8%)	29 (24%)
total	291 (15%)	150 (22%)	81 (68%)

SBP, systolic blood pressure; DBP, diastolic blood pressure; HTN, hypertension; hHTN, history of hypertension

PP.45.24 THE EFFECT OF 2-YEAR INTERVENTION ON BLOOD PRESSURE IN THE COMMUNITY OF JAPANESE SMALL ISLAND HABITANTS

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Objective: There is few report on the effect of a comprehensive intervention on blood pressure (BP) control and salt restriction in the community level. We investigated the effect of 2-year intervention on BP in the community of Japanese small island habitants.

Design and method: Subjects were 391 habitants of Oshima Island and we finally recruited 186 of them (mean age 71.38 years, women 64.0%) who completed our interventional course. At baseline, 12 months and 24 months later, we measured clinic BP, body height, and body weight. Subjects were also asked to collect their first urine in the morning to measure salt excretion and urine albumin-to-creatinine ratio (UACR). A 24-h urinary salt excretion was estimated using INTERSALT formula. As interventions, we took diet history questionnaire and provided dietary counseling by dieticians or students of the graduate school of nutrition. Continuous spreading of the educational information on 'Hypertension' and 'Salt restriction' was also made through outpatient service and community journals.

Results: Among all subjects (N=186), estimated 24-h urinary salt excretion showed a significant decrease from baseline (9.36±2.17 g/day) to 12 months (9.02±2.11 g/day, p<0.05), while it increased at 24 months (9.38±1.94 g/day). As a result, the percentage of those who achieved the target level of salt restriction (advocated by the Ministry of Health, Labour and Welfare, or the Japanese Society of Hypertension) did not show a significant change. On the other hand, both systolic and diastolic BP decreased significantly during the 12 and 24 months follow up period (baseline: 145±22/78±11 mmHg, 24 months: 138±17/72±11 mmHg, p<0.01). Among hypertensive patients (N=155), number of subjects on antihypertensive medication increased, and those under <140/90 mmHg increased significantly. The UACR also showed a significant decrease from baseline (30.8±116.6 mg/gCr) to 24 months (22.1±46.8 mg/gCr, p<0.01).

Conclusions: A continuous medical and nutritional intervention to the community may result in better control of hypertension, while further approach is necessary to encourage salt restriction in small island habitants.

PP.45.25 COEXISTENCE OF PM2.5 AND LOW TEMPERATURE IS ASSOCIATED WITH HIGH HOME BLOOD PRESSURE LEVEL

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Objective: The effect of fine particulate matter (PM2.5) on the relationship between temperature and BP level is not well known. We performed this study to investigate whether or not there's any interaction between temperature and PM2.5 concentration on home BP level.

Design and method: During 91 days in spring 2013 (from April 1st to June 30th), we gathered daily information of the temperature and the PM2.5 concentration in Munakata city, Japan. We created the database using all home BP data available, and matched temperature/PM2.5 data during the period above in 40 hypertensive patients. Home morning and evening SBP, DBP, pulse pressure (PP) and pulse rate (PR) were analysed. Pearson's correlation analyses were used to analyse the relationships between temperature, PM2.5 and BP/PR parameters. General Linear Model (GLM) was used to calculate the interaction between temperature and PM2.5 on home BP parameters adjusting for sex, age, and BMI.

Results: There were 40 subjects; female 52.5%; mean age 74.4±6.9 years; and mean BMI 24.2±3.6 kg/m2. Both 6AM-temperature and mean-temperature showed significant inverse associations with PM2.5 (r=-0.28, p<0.001, and r=-0.04, p<0.05). Table shows the associations between temperature, PM2.5 and BP parameters. Temperature data were inversely associated with all morning and evening home SBP/PP/PR data except for evening PP. However, PM2.5 data solely was not associated with any of these parameters. There were significant interactions between 6AM-temperature and PM2.5, and mean-temperature and PM2.5 on morning home SBP (both p<0.01) and on evening home SBP (p<0.05 and p<0.01). The relationship was also seen for home PP (p<0.05). However, there were no interactions between temperature and PM2.5 on home PR.

Table. Correlations between temperature, PM 2.5 and home BP parameters

	Morning home SBP (mmHg)	Evening home SBP (mmHg)	Morning home PP (mmHg)	Evening home PP (mmHg)	Morning home PR (bpm)	Evening home PR (bpm)
Temperature of 6 o'clock in the morning (℃)	-0.19***	-0.06**	-0.05*	0.02	-0.07***	-0.07***
Mean temperature of the day (℃)	-0.18***	-0.10***	-0.04*	0.01	-0.06**	-0.06**
PM 2.5 (μg/m³)	-0.002	-0.03	-0.01	-0.005	0.03	0.01

This table shows the correlations between temperature, fine particulate matter and home BP parameters
PM 2.5, particulate matter 2.5; PP, pulse pressure; PR, pulse rate
Values are correlation coefficients. *p<0.05, **p<0.01, ***p<0.001.

Conclusions: High concentration of PM2.5 and low temperature existing together could be associated with high home BP level. Meteorological relationship between low temperature and PM2.5 would be one of the mechanisms of it.

PP.45.26 TRENDS IN PREVALENCE, AWARENESS, TREATMENT AND CONTROL OF HYPERTENSION IN THE REPUBLIC OF SEYCHELLES (AFRICAN REGION) BETWEEN 1989 AND 2013

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Objective: We assessed the awareness, treatment and control of hypertension in the Seychelles between 1989 and 2013. In the Seychelles, heath care is free to all inhabitants within a national health system, inclusive all hypertension medications.

Design and method: Four surveys were conducted in 1989, 1994, 2004 and 2013 (Seychelles Heart Studies I, II, III and IV) in random samples of the population aged 25-64 (N >1000 and participation rate >75% in each survey). BP was measured with an oscillometric device in 2013 (Omron M3) and mercury devices (Boso) in previous surveys, with cuff width adapted to arm circumference. The mean of the second and third BP readings is considered.

Results: Results varied by age. Data at age 45-64 years are shown in the Table (*: χ <0.05).

	Men					Women				
	1989	1994	2004	2013		1989	1994	2004	2013	
n	281	261	308	259	*P*	302	278	362	317	*P*
BMI ≥30	4.7	9.2	19.4	19.7	*	30.0	37.0	43.9	44.1	*
Median MAP (mmHg)	122.4	127.0	121.2	122.2	ns	119.8	122.5	117.2	117.6	*
BP ≥140/90	60.0	67.9	57.0	53.0	*	53.3	53.4	43.9	43.0	*
BP ≥140/90 or Rx (HBP/Rx)	61.4	69.0	64.5	64.9	ns	56.9	56.7	61.0	64.0	ns
% aware (of HBP)	37.7	34.8	64.7	65.1	*	52.8	57.1	80.4	75.2	*
% treated (of aware)	39.5	61.6	60.8	75.4	*	67.5	70.9	80.0	88.4	*
% controlled (of treated)	9.4	7.5	24.5	35.7	*	18.7	14.6	36.9	50.7	*
% controlled (of HBP/Rx)	0.9	1.1	6.2	11.4	*	3.8	3.4	14.5	21.6	*

Conclusions: Median MAP (expectedly insensitive to treatment) did not increase over time despite increasing obesity prevalence. Nearly two thirds of adults aged 45-64 had hypertension (HBP or treatment): this proportion did not decrease over time, consistent with more persons being treated (including some people without confirmed HBP). BP detection, treatment and control improved markedly over time, with more favorable rates in women than men. Improved BP control (e.g. decreasing prevalence of BP >=140/90) likely partially accounts for decreasing cardiovascular mortality rates between 1989 and 2012 reported in the Seychelles. Yet, the proportion of hypertensive persons with controlled BP is still far from optimal and there is a need to further strengthen both clinical and public health approaches for BP reduction.

PP.45.27 PECTORAL ANGINA MEDICATION WITH SIDE EFFECTS IN ORAL CAVITY

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Objective: Drug-induced gingival overgrowth is a known side effect of certain chemotherapeutic agents used for the treatment of systemic disorders. Gingival enlargement induced by nifedipine, a calcium channel blocker, has been reported in human and animal studies. Candidal infections often develop because of immune suppression.

Design and method: A 51 year old male presented with a chief complaint gingival hemorrhage and difficulty in inserting his denture, noted for a period of approximately 3 months. Thorough clinical examination revealed a generalized gingival enlargement involving the mandible and maxilla. Gingival hemorrhage is noted on probing, but not to an extensive degree. Candidal hyphae were present on the oral mucosa.

Results: A thorough review of the medical history revealed the following: 5 years history of treatment for hypertension; cigarette smoking (4/day); policystic kidney with chronic kidney deficiency; 31 years of working in chemistry laboratory.
General evaluation reveals mild hypertension (180/90 mmHg), bradycardia (50 b/min), edema and venectasia in lower limbs and mild parestesis in fingers. The patient notes that he suffers from hypertension, angina and difficulty in breathing at rest. The patient is presently under treatment for his angina and, approximately 4-5 months ago he was prescribed Felodipine for this condition. Felodipine is an antianginal drug belonging to a class of pharmacological agents, the calcium channel blockers. Unfortunately, one of the adverse effects of this medication is generalized gingival hyperplasia. Clinically, the generalized gingival hyperplasia (enlargement), in most patients, appears 2 to 3 months after the initial administration of the Felodipine.

Conclusions: The main cause for gingival hyperplasia in our patient probably was drug-induced over-growth, and bacterial plaque but in a smaller degree.
The patient was advised: to keep a meticulous oral hygiene; for antianginal drug substitution; dental reevaluation and treatment.

PP.45.28 WORKING OUTCOME AFTER MYOCARDIAL INFARCTION: STUDY OF FACTORS AFFECTING THE OCCUPATIONAL REHABILITATION

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Objective: The improved ventricular function, increased functional capacity assessed in METS and the making of a cardiac rehabilitation program improves working outcome after myocardial infarction. The return to work after a myocardial infarction is conditioned by a number of clinical factors, psychological and business that may affect work performance. The aim of this work is to evaluate the working outcome three months after a myocardial infarction.

Design and method: We examined 124 patients (109 M, 15 F), working age (48 ± 11 years) with recent myocardial infarction at 3 months after hospital discharge. 72% were exposed to risk of biomechanical overload with the handling of loads, 28% administrative employees. 88% had undergone PTCA, 12% had been treated with medical therapy alone. All resumed work between 1 and 2 months after the event.
The working outcome was evaluated by the number of lost work days through the administration of the questionnaire Work Performance Scale (WPS) which allows us to study the perception of job performance and through the questionnaire HADS (Hospital Anxiety and depression Scale) to assess anxiety and/or depression presence. The clinical variables studied were the ejection fraction, functional capacity and execution of a program of cardiac rehabilitation. Statistical analysis was performed using the Student's T test for unpaired data.

Results: The WPS scores were lower in patients who had a decline in ejection fraction (EF), lower functional capacity and who had not cardiac rehabilitation. Higher scores on the HADS-anxiety questionnaire correlated with a lower EF, with a lower functional level in METS. A similar correlation for the scores of the questionnaire HADS-depression. No workday was lost in the group that had carried out the cardiac rehabilitation, with EF >= 45% and with greater functional capacity (METs> 5).

Conclusions: A lower functional capacity, a decline of EF and the non-operation of the cardiac rehabilitation are related to a worse outcome of work. The non-operation of cardiac rehabilitation is strongly associated with elevated levels of anxiety and/or depression. All of these factors must be considered by the competent doctor for the reintegration of heart disease.

PP.45.29 DIETARY HABITS AND PHYSICAL ACTIVITY OF HYPERTENSIVE PATIENTS WITH CORRELATION TO DEMOGRAPHIC DATA IN WEST SOBA, SUDAN

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Objective: Ascertain the extent of physical activity and dietary habits and possible correlation with age, gender, educational level and duration of hypertension in Sudanese hypertensive.

Design and method: A cross-sectional study, conducted in the West-Soba Health-centre on the International Day of Hypertension – May-2012. The study group compromised hypertensive patients attending the health centre for follow up., where data was collected using a structured questionnaire which and analyzed via Software Package for Statistical Analysis.

Results: The study consisted of 90 females and 49 males; all hypertensives and residing West Soba; their ages ranging between 26 years to 85 years with a mean 54.2±11.497. The study revealed that 19.7% of the sample added more than two tea spoons of salt to food per day, and more than half added only one teaspoon. Majority ate big amounts of vegetables which denoted eating vegetables besides daily salad serving; yet 1.5% ate no vegetable at all. Concerning type of meat; more than one third reported eating all types of meat; 18% ate beef only and only 10% reported eating chicken and fish only. 71% of the sample did no regular significant physical activity and only 10% performed regular physical activity more than twice per week. However; no significance relation was found between age; gender; educational level or duration of hypertension and the dietary and physical habits of the samples (p:>0.05; significance correlation p:<0.05).

Conclusions: The unhealthy habits of the hypertensive residents of West Soba are addition of salt, intake of fatty meat (red meats) and lack of physical activity.

The findings of this study suggests that further interventions should focus on health education on diet and particularly physical activity since it is not effected by economic status (Sudan; is a third world country), this of course necessitates certain strategies to so that information gets to all hypertensive patients of all ages and educational levels.

PP.45.30 HIGH NORMAL BLOOD PRESSURE TRIPLES CARDIOVASCULAR MORTALITY IN A SWEDISH POPULATION

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Objective: The aim was to investigate the risk of cardiovascular disease (CVD) associated with different blood pressure categories from optimal blood pressure to manifest hypertension. Few previous studies have investigated the complete blood pressure distribution.

Design and method: A random population sample in south-western Sweden was invited for a survey of cardiovascular risk 2002-2005. In all, 2816 subjects aged 30-75 years participated (76%). All were exposed to a physical examination including blood pressure, anthropometrics, and an OGTT. Blood pressure was categorised according to ESH/ESC guidelines from optimal (<120/<80 mm Hg, both) to high normal blood pressure (130-139/85-89 mm Hg, the highest alternative). Manifest hypertension was based on a known diagnosis, or in new cases on three blood pressure readings >=140/>=90 mm hg (one or both) with 2 weeks interval. Information on lifestyle and psychosocial characteristics was collected by validated questionnaires. Information on incident cases of CVD over a mean 8 years follow-up was collected from national registers. Fatal and nonfatal CVD comprised myocardial infarction, heart failure, arterial fibrillation, percutaneous coronary intervention, and coronary artery intervention by-pass grafting. Hazard ratios with 95% confidence intervals were estimated by Cox proportional regressions using optimal blood pressure as reference. All analyses were adjusted for differences in age, sex, BMI, HOMA-ir, ApoB/ApoA1, hs-CRP, smoking, alcohol consumption, physical activity, and education.

Results: Outcomes were equal in men and women and an interaction-term between sex and blood pressure categories was non-significant. Men and women were thus combined in further analyses. In those 1353 participants with optimal blood pressure there were 11 events (0.8%) of CVD. In 615 with normal blood pressure there were 20 events (3.3%) with a HR of 2.6 (1.06-6.47). Corresponding outcome in normal high, temporarily high, and manifest hypertension, respectively, were: 25 (8.5%), HR 3.4 (1.4-8.4); 12 (9.2%), HR 2.4 (0.8-6.8); 68 (16.4%), HR 3.6 (1.5-8.9).

Conclusions: Individuals with high normal blood pressure should be identified and advised on lifestyle changes to decrease global risk and to prevent progression to manifest hypertension. Population strategies targeting normotensive individuals should also be improved.

PP.45.31 SALTSWITCH: A SMARTPHONE APPLICATION TO HELP CONSUMERS MAKE LOWER SALT FOOD CHOICES

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Objective: Existing front-of-pack labeling (FoPL) schemes are difficult for consumers to understand and so we developed a phone app FoodSwitch to help consumers identify healthier foods in stores. As processed foods are largely responsible for excessive dietary salt intakes, and reducing salt intake is key to reducing blood pressure levels, we then adapted this app so that it could be used to help consumers select lower salt food choices in the supermarket.

Design and method: The original FoodSwitch app was based on a database containing nutritional information and barcodes for 50,000 Australian packaged foods, categorised into >850 categories., The app highlighted levels of total fat, saturated fat, sugar and salt through traffic light labels based on UK Food Standards Agency guidelines. Nutrient profiling criteria was applied to each product to calculate which items appeared as healthier choices within the app. The SaltSwitch filter was then applied so that when people scanned a product only the lowest salt options were displayed.

Results: FoodSwitch was created in January 2012 and downloaded by >400,000 users in 18mths. A SaltSwitch filter option for hypertensives was introduced in November 2012 resulting in 8,000+ downloads in the week after release. When the barcode of a food product is scanned, SaltSwitch displays the traffic light colour for total fat, saturated fat, sugar and salt. A listing of lower salt products is shown on the screen. Nutritional information for >30,000 additional products has been obtained from users through a crowd-sourcing function integrated within the application. Nutritional information for >300 products is still sent in by users each week. The app has been launched in New Zealand with huge success and will be launched in the UK in February 2014, with plans to launch in China, India and the USA by 2015.

Conclusions: SaltSwitch has enabled hypertensive consumers to more easily identify lower salt food choices. With the WHO identifying salt reduction as one of the "best buys" for population blood pressure reduction, there appears to be significant opportunity for this approach in many other countries.

PP.45.32 INFLUENCE OF HEALTH CARE IN SUMY CITY POPULATION

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Objective: Reforming the health care system in Ukraine is one of the priorities of modern social policy and an integral part of the socio-economic transformation of the Ukrainian state as a whole, as highlighted in the Economic Reform Program for 2010/2014. The main objective of the reform is to improve the health care of public health, to ensure equal and fair access of all citizens to health care of appropriate quality.
The aim of the study was to analyse the real impact of health care institutions on the state of health of Sumy city.

Design and method: The study was performed using statistical, analytical and informative method, expertise and descriptive modelling. We analysed the medical and demographic population Sumy, morbidity, disability and primary activity was investigated outpatient and inpatient facilities from the point of discharge of standard during their maximum load (January-March).

Results: The study showed that a significant positive impact, existing health care system on health Sumy were found. We observe a paradoxical phenomenon - in recent years, with increasing numbers of doctors in not achieved a significant reduction in mortality and morbidity. Increased morbidity cardiovascular diseases, particularly hypertension, malignant neoplasms and mental illness, increased mortality from tuberculosis are higher than the regional level primary disability. Along with the deterioration of the health care system in the last 10 years there were two opposite processes - increasing number of physicians (23.5%) and reducing the number of beds (34.3%).
The family doctors perform it reached 94.6% in the 'narrow' specialists barely exceeded half, and in-patient medical institutions function was performed at 60.3%. Analysis of the use of hospital beds has shown that employment rates beds in recent years, is lower than the regional and national figures (in 2011 it decreased to 313.2 days., The regional rate - 319.6 days, Ukraine - 326.9 days).

Conclusions: This study confirms the validity of reforming the health sector based on the priority of primary health care through the development of family physicians.

PP.45.33 SPATIAL VARIATIONS OF SODIUM AND POTASSIUM INTAKE IN ITALY AND ASSOCIATIONS WITH SOCIO-ECONOMIC STATUS

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Objective: Inequalities in socio-economic status (SES) translate into inequalities in health. In Britain, salt intake is higher in low SES, independently of geographic variations. We aimed to assess geographic and SES gradients in sodium (Na) and potassium (K) intake in Italy.

Design and method: We conducted an analysis on the Italian Observatory Epidemiological Cardiovascular/Health Examination Survey (OEC/HES) 2008-2012 cohort, a sample of Italian adult population (39-75y: n=4,975). 100 men and 100 women were randomly sampled in 20 Italian regions and urinary electrolytes were measured as part of the MINISAL-GIRCSI to assess the habitual dietary Na and K intake. The methods included a questionnaire covering socio-demographic information, lifestyle, and physical activity, anthropometric measurements and a 24h urine collection. Two indicators measured SES: education and occupation. Bayesian geo-additive mixed models were used to assess the spatial effect, SES pattern and nonlinear effects of covariates of Na and K excretions via Markov Chain Monte Carlo simulations using 18 mainland regions.

Results: A significant north–south pattern of Na excretion was found from posterior probability maps after controlling for important socio-demographic factors. Participants living in southern Italy had a significantly higher Na excretion than the other regions. When compared to occupation I (top managerial occupations), occupations III and IV had, on average, a 6.5% higher Na excretion. When compared to those with a university degree, participants with primary and junior school education had, on average, a 5.9% higher Na. The SES gradient explained the spatial variation. K excretion was higher in central and in some southern regions. Those in occupation V (low-skill workers) showed, on average, a significantly 3% lower K excretion compared to occupation I. However, the SES gradient only partially explained the spatial variation.

Conclusions: Na and K intake vary across Italy. Crucially, salt intake is significantly higher in less advantaged social groups. This gradient is independent of confounders and explains the geographical variation. There are geographic and SES variations in K excretion, a bio-marker of K intake. K intake is higher in central and southern regions and is lower in low-skill workers.

PP.45.34 BLOOD PRESSURE DECREASE WITH A MOBILE PHONE-BASED SYSTEM TO SUPPORT SELF-MANAGEMENT

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Objective: The effectiveness of a mobile phone-based system for supporting self-management of hypertension was evaluated in relation to its impacts on blood pressure and to patients' own evaluations.

Design and method: Components of the system were derived in interviews with patients and clinicians and included: 1) a module for self-report of clinical outcome (blood pressure, pulse), lifestyle (medication intake, physical activity, stress) and wellbeing (general health, symptoms) variables; 2) a module for automatically delivering tailored periodic reminders and encouragements; 3) a module for enabling feedback illustrating relationships between self-report variables. The system was designed for use on all mobile phones with internet access. 50 hypertensives (age=mean 60, 48% female) were recruited from primary care and performed self-reports once daily during 8 weeks. The feedback module was accessible at any time. Patients were interviewed about their experiences during and at the end of the study.

Results: A mean decrease in systolic blood pressure of 4.9mmHg was observed between the first and last ten days of interaction with the system. Patients considered the system to be easy to use and helpful in self-managing their hypertension by generating new insights into the interrelationships of drug intake, physical activity and stress with blood pressure, symptoms and wellbeing.

Conclusions: The system seems to be a useful tool to help patients gain awareness of the interplay between clinical outcomes, lifestyle factors and wellbeing, which may ultimately lead to better self-management and thereby control of their hypertension. Analyses are currently being conducted to identify characteristics of patients who are likely to benefit most from the support system.

POSTERS' SESSION

LATE-BREAKERS POSTERS' SESSION 3

PP.LB03.01 PREDICTORS UNFAVORABLE PROGNOSIS IN PATIENTS WITH ESSENTIAL HYPERTENSION IN 20 YEARS ACCORDING GUIDELINES ESH 2013

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Objective: The aim of longitudinal study was to determine possible hemodynamic and humoral predictors unfavorable prognosis in hypertensive patients (pts) according new guideline ESH 2013 and to evaluate the occasiones of death.

Design and method: At baseline 145 patients (pts) were screened for stage 1 and 2 hypertension. Left ventricular (LV) structure were assessed by M-mode echocardiography. LV hypertrophy was defined as a LV mass index (LVMI) more 115 g/m2 in men and more 95 g/m2 in women. At the reexamination in 20 years 102 alive pts were included into the first group (gr.), in 2-nd gr. - 43 hypertensive pts died from cardiac and vascular fatal complications :stroke, acute myocardium infarction, aorta aneurysm, pulmonary thrombembolia, sudden death. These groups were identical for age (approximately 43 years), pulse rate, systolic blood pressure level at the baseline investigation.

Results: The diastolic blood pressure (DBP) was more significantly ($p<0.001$) increased in the 2-nd gr. 109,46±1,48 mm Hg than in the 1-st gr. 102,3±1,00 mm Hg at the initial examination. The normal LVMI consisted 50,5% in the 1-st gr. and 29,3% in the 2-nd gr. Results indicated a very high prevalence of LV hypertrophy (LVH) in the 2-nd gr. - 83,4% against 65,2% in the 1-st gr. ($p<0.05$). We observed concentric LVH in the 2-nd gr. more often – in twice time (1-st gr.:16,8%; 2-nd gr.: 38,1%). In group of died pts (2-nd) level cortisol of blood were significantly ($p<0.01$) higher 600,71±75,23 nmol/l than in the 1-st gr. 342,18±53,87 nmol/l.

Group patients	NLVG	CLVR	CLVH	ELVH
1-st group, %	34,7	14,7	16,8	33,7
2-nd group, %	16,7	4,8	38,1	40,5

NLVG – normal left ventricular geometry, CLVR – concentric left ventricular remodeling, CLVH – concentric left ventricular hypertrophy, ELVH – eccentric left ventricular hypertrophy.

Conclusions: Our scientific data suggest that increase DBP, LVMI, especially concentric LVH, level of cortisole are predictors unfavorable survival rate in pts with essential hypertension in a long-term (20 years) follow up.

PP.LB03.02 ASSOCIATION BETWEEN LEVELS OF ERYTHROPOIETIN AND PATHOLOGICAL CYTOKINES IN PATIENTS WITH CHRONIC HEART FAILURE AND ANEMIA

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Objective: Among the possible reasons of anemia increase of pathologic cytokines (PC) product, tumor necrosis factor –α, capable to cause either immunosuppression and lowering of erythropoietin activity, erythrocytes formation in red bone marrow and iron metabolism is of great interest .The on this relation and on regess of symptoms chronic heart failure . Purpose of investigation to study relation to levels of erythropoietin and pathological cytokine of patients in chronic heart failure with anaemic syndrome and erythropoietinic effect and security of continuous erythropoietin reseptor activator methoxy polyethilenglicol-epoietin beta its impact.

Design and method: 94 patients in chronic heart failure NYHA class 3 - 4 with a left ventricular ejection fraction of 40% or less and with anemia were included in investigation (58 males, 36 females).46 patients received traditional treatment of chronic heart failure (1 group) and 48 patients were treated additionally with erythropoietin (2 group). The reason of chronik heart failure was coronary heart disease (postinfarcticcardiosclerosis) n=45, or chronic heart disease with diabetes mellitus of the 2 -nd type n=15, with arterial hypertension n=14, or coronary heart disease+arterial hypertension+diabetes mellitus n=20. Percutaneous erythropoietin 50 IU monthly to patients without iron deficiency for a period of 6 months. Echocardiography parameters, plasma NT and pro-BNP, cytokines,erythropoietin, ferritin and 6-minute walking test were assessed at baseline and after treatment.

Results: In patients with chronic heart failure and anemia in 2 group erythropoietin treatment increased Hb levels by 22,4% ($p<0,05$) and erythropoietin serum levels by 29,3±4,3 IU/ml ($p<0,001$). Increased erythropoietin level was associated with decrease of cytokines levels. IL -1 by 36,6% ($p<0,001$), IL- 6 by 54,3% ($p<0,05$),TNF-α by 48,3% ($p<0,05$) compared with patients in 1 group.

Conclusions: Correction of anemia in patients with chronic heart failure with percutaneous methoxy poliethylen glicol epoietin injections 50 IU monthly for 6 month period to improve erythropoietin deficit and cytokines aggression and associated anemia, symptoms and quality of life.

PP.LB03.03 THE DUAL REGULATORY EFFECTS OF CALCIUM CHANNEL BLOCKERS IN SIGNAL TRANSDUCTION IN VASCULAR SMOOTH MUSCLE CELLS

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Objective: RGS2 (regulator of G-protein signaling-2)-deficient mice exhibit persistent vascular constriction and severe hypertension, and genetic variations of RGS2 occur in hypertensive patients. Moreover we have known that RGS2 mRNA expression was up regulated by angiotensin II (Ang II) stimulation in vascular smooth muscle cells (VSMC). This study was to disclose the role of calcium channel blockers (CCBs) in signal transduction through RGS2.

Design and method: VSMCs were isolated from thoracic aortas of male Wistar rats and cells between passages 4 to 6 were used at semi-confluence growth state. VSMC were incubated in azelnidipine, amolnidipine or cilnidipine (~40nM) and cells were collected. RGS2 mRNA expression was performed by real-time quantitative reverse transcription-polymerase chain reaction (QRT-PCR).

Results: Azelnidipine (~4nM and ~40nM) dose-dependently increased RGS2 mRNA expression in VSMC ($p<0.01$). On the other hand, RGS2 mRNA expression was increased with cilnidipine (~40nM) stimulation and the cells were pre-incubated with PKC inhibitor for 30 minutes, PKC inhibitor significantly decreased cilnidipine-induced RGS2 up-regulation by 50% ($p<0.05$).

Conclusions: These results suggest that CCBs decreased post-receptor signal transduction through the up-regulation of RGS2 mRNA expression and this up-regulation of RGS2 mRNA expression possibly via N-type calcium channel.

PP.LB03.04 ACUTE CARDIAC FAILURE COMPLICATED WITH ACUTE RENAL FAILURE (CARDIORENAL SYNDROME)

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Objective: The aim of our study was to evaluate the prevalence of acute renal failure in acute heart failure patients and the efficacity of different medications such as diuretics and inotropic agents in the treatement of cardiorenal syndrome.

Design and method: A representative sample of 195 patients, hospitalised in the cardiology clinic, University Hospital Center in Tirana , with acute heart failure symptoms, in 2008- 2013.
There were colected personal datas about hospitalisation period, cardiovascular risk factors, acute heart failure symptoms (dispnea in rest, exertional dispnea, ortopnoea, nocturn dispnea), angina pectoris, periferal oedema, pulmonary rales, jugular veins distention.

All patients were measured blood preasure, glicemia, creatininemia, uremia, electrolits, cholesterol, HDL- cholesterol, LDL- cholesterol, Triglicertides, BMI. All patients underwent ECG examination and echografic examination.

Results: Overall the prevalence of acute renal failure in acute heart failure patients was 22.6% (44/195).
It was higher in man than in woman, respectively 73% and 26,7%.
It was not found significant association between ejection fraction and the presence of acute renal failure.
It was observed diminution of the creatinine leves in patients treated with diuretics (p = 0,01987) compared with patients that didn' t use diuretics.
It was not found significant association between creatinine levels and the use of inotropic agents.

Conclusions: In our study the prevalence of acute renal failure in acute heart failure patients was 22, 6% aproximately that reported in other similar studies (19- 45%) and it was higher in patients aged 50- 70 years old.
The use of diuretics is very important in the improvement of renal function, evaluated with creatinine blood levels.
Inotropic drug are useful in the relief of heart failure symptoms but they are not significant in the acute renal failure prognosis.

PP.LB03.05 METABOLISM DISORDERS AS FACTOR OF ENDOTOXEMIA IN GERIATRIC PATIENTS WITH CORONARY HEART DISEASE

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Objective: Nowadays the role of endotoxemia in the pathogenesis of many diseases, which leads to a change in reactivity or acts as an independent syndrome, is studied intensively. It is important the development and use of diagnostic approaches for the study of biochemical mechanisms of endotoxemia in elderly patients with coronary heart disease (CHD) against the background of adjuvant therapy, which was the aim of our work.

Design and method: It was provided clinical and laboratory observations among 91 elderly patients diagnosed with coronary artery disease: stable angina (60 patients received combined therapy with the use of pentoxifylline and 31 people who received standard therapy). Clinical material (blood plasma) was picked via venopunction using blood systems Monovette (Sarstedt, Germany) with an anticoagulant K-EDTA. The level of moleculas with average weight (MAW), malondialdehyde (MDA), lipid peroxidation (LPO) and catalase and uric acid (UC) was determined with a standard set of reagents on biochemical analyzer Metrolab 1600-DR (Argentina).

Results: Investigations of the treatment dynamics in elderly patients with CHD showed the increasing of biochemical markers of endotoxemia: MAW, UC, lipids and prooxidant status indicators - MDA, LPO. Disorder of antioxidant status is determined not only through the increasing of pro-oxidant, but also through reducing the antioxidant status via lowering of catalase level. Treatment with purine metabolism activator -pentoxifylline caused the improvement of investigated biochemical marker indexes, comparing to the control group.

Conclusions: Results obtained during clinical studies of endotoxemia in elderly patients with CHD have shown that endogenous intoxication leads to the development of severe disease. Studies of endotoxemia is an important step to recovery, because allow to detect the risk of pathological conditions on the early stages of the disease, which makes it possible to take the necessary measures to prevent the development of disease and the leveling its consequences on the early stages.

PP.LB03.06 IMPACT OF VALSARTAN 160 MG ON OFFICE BLOOD PRESURE, ABPM AND HBPM IN CHINESE PATIENTS WITH MILD TO MODERATE HYPERTENSION

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Objective: Recently, measurement of BP out of the clinical office has received a lot of attention. A few clinical trials have reported 160 mg as starting dose of valsartan. The goal of the present study was to determine the efficacy and safety of valsartan 160 mg in Chinese hypertensive patients.

Design and method: This prospective, multi-centre, open-label, single treatment group study included outpatients who had mild to moderate essential hypertension. Patients were naïve to hypertension treatment or were on antihypertensive monotherapy with MSSBP<160 mmHg and MSDBP<100 mmHg. They received a 2-week treatment of valsartan 80 mg per day, followed by 160 mg per day for the remaining 8 weeks. The primary efficacy variables included change in office MSSBP/MSDBP at week 10 from week 2 and week 0.

Results: 195 patients were included in intent to treat (ITT) population, and 179 completed. The average age was 52.9 years. At week 10, change in MSSBP/MSDBP compared with baseline was -15.6 /-11.1 mmHg (P<0.001), while the change was -4.6 /-2.2 mmHg (P<0.001) when compared with week 2. The reduction on average of 24-hour ABPM was -6.1 /-4.4 mmHg (P<0.0001) and the reduction in HBPM was -13.3 /-9.1 mmHg (P<0.0001). At week 2, control rate of office BP was 40.5%, which increased to 56.9% at week 10. After 10-week treatment, the control rate of SBP/DBP using 24h ABPM increased to 23.4%. The control rate of HBPM was 66.7% at week 10 compared to 26.1% at baseline, and was 80.4% among the patients whose office BP reached the goal. The proportion of patients who transformed from non-dipper into dipper was 41.2% (P<0.05) at week 10. After 10 -week treatment, 75.0% of patients with initial evidence of morning BP surge at baseline did not demonstrate a morning BP surge. The incidence of drug related AEs was 3.1%, and the number of AEs leading to discontinuation was 1.5%.

Conclusions: This study demonstrated that valsartan 80 mg-160 mg was well tolerated and significantly reduced office BP, 24h ABPM, as well as HBPM in Chinese patients with mild to moderate hypertension.

PP.LB03.07 DAILY HYPERVENTILATION IN OBSTRUCTIVE SLEEP APNEA SYNDROME

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Objective: Each episode of apnea during sleep in patients with obstructive sleep apnea (OSA) is accompanied by hyperventilation, arising in response to hypoxia. Possibly, the incorrect breathing rhythm persists in the daytime as well. The purpose of our research is to detect hyperventilation in patients with OSA and to discover its relationship with various parameters of cardiopulmonary monitoring.

Design and method: The study involved 44 patients aged 33 to 75 years (mean 53.86±10.09 years) with mild to severe stages of OSA. There were 21 women and 23 men. The cardiopulmonary monitoring was performed to confirm the diagnosis and to clarify the severity of OSA. The screening system ApneaLink (ResMed, Germany) was used. The hyperventilation was evaluated using the determation of carbon dioxide in final portion of exhaled air (FetCO2) using the device TIDAL WAVE (Novometrix, USA). The analysis was performed using computer software Statistics 6.0. The significance level was defined as $p<0.05$.

Results: The hyperventilation was revealed in 79.5% of patients. The average value of FetCO2 was 4.35±0.6%. We find that the increase of OSA severity significantly leads to decrease of hyperventilation ($r=0.45$, $p=0.01$).

Conclusions: The increase of OSA severity leads to decrease of hyperventilation. We suppose that it is due to hypoventilation because of obesity and limited movement of diaphragm in such patients. It is confirmed by almost all derived indicators of the OSA severity. Thus hyperventilation accompanies the cessation of breathing during sleep but does not recur in the daytime, and, moreover, with the number of episodes of apnea (AHI) of CO2 in final portion of exhaled air is close to normal.

PP.LB03.08 RELATIONSHIP BETWEEN BLOOD PRESSURE CONTROL AND RISK OF NEW ONSET ATRIAL FIBRILLATION IN ELDERLY PATIENTS WITH HYPERTENSION: LONG-TERM FOLLOW-UP AFTER CORONARY BYPASS GRAFTING PROCEDURE

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Objective: Postoperative atrial fibrillation (AF) occurs in up to 40% coronary bypass grafting (CABG) procedures.We assessed the hypothesis that blood pressure (BP) lowering therapy may decrease the incidence of new-onset AF in elderly patients with hypertension in the long-term follow up after CABG.

Design and method: A total of 380 patients>65 years with hypertension, who underwent CABG procedure were studied and devided into four groups based on mean office BP achieved: a normotensive group (n=102), a HTN group with goal BP control (n=98), HTN group with poor BP control- (n=78) and HTN group with moderate BP control (n=102). Patients were followed for 48 months.

Results: The incidence of new onset AF during 48 months was significantly higher in HTN group with poor BP control (hazard ratio: 6.02; 96% confidence interval: 2.322-18.020; p<0,001). The incidence of new onset AF depended on long-term level of BP control.

Conclusions: In the long-term follow up patients after CABG procedure, poor BP control increased the risk of new onset AF in elderly patients with hypertension.

PP.LB03.09 THE USE OF ANTHROPOMETRIC INDICATORS IN PREDICTING HYPERTENSION IN EMPLOYEES OF PUBLIC UNIVERSITY RESTAURANTS, SÃO PAULO, BRAZIL

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Objective: Evaluate the best anthropometric predictor of the determination of arterial hypertension in adults among the indexes BMI, waist-to-height ratio (WHtR) and the Body Shape Index (ABSI).

Design and method: Cross-sectional study with a universe of a Public University of São Paulo City (N = 174) restaurant employees between 21 and 65 years old. The data collection involved structured socioeconomic questionnaire, blood pressure measurement, weight, height and waist circumference. Hypertension was defined as blood pressure > or = 140/90 mmHg or use of antihypertensive medication. Analyzed which of the studied indexes, presented itself as a better predictor of hypertension in this population through analysis of Poisson regression with robust variance were performed (confidence interval = 95%), with hypertension or not the outcomes. A comparison of the adjustment of the prediction models was through the Akaike Information Criterion (AIC).

Results: The prevalence of hypertension and overweight / obesity were respectively 23.0% and 60.9%. The best predictors were the ABSI ((RP=2.20; IC95% 1.19-4.07), BMI (RP=1.07; IC95% 1.011-1.13) and the WHtR index wasn't a good predictor (RP=3.07; IC95% 0.30-52.5), as can be analyzed by its values of prevalence ratio and confidence interval. There was a slight difference between the models with BMI (AIC = 201.19) and ABSI (AIC = 202.32). There were no significant differences in model fit for predicting BMI and ABSI. Thus, BMI was found to be the best anthropometric index to predict the chance of hypertension in this population.

Conclusions: These results corroborate the fact that the BMI index is being globally accepted as a predictor of hypertension.

PP.LB03.10 THE RELATIONSHIP OF A BODY SHAPE INDEX AND CARDIOMETABOLIC RISK FACTORS IN OBESE HYPERTENSIVE PATIENTS WITH DIFFERENT DEGREES OF HYPERTENSION

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Objective: It is known that accumulation of excess fat in the abdominal cavity leads to the development of diabetes mellitus, cardiovascular diseases and, as a consequence, increases the risk of premature death. "A Body Shape Index" (ABSI) is a recently proposed index that standardizes waist circumference for body mass index (BMI) and height.
The aim of our study was to investigate the relationship between the body shape index and cardiometabolic risk factors depending on the degree of arterial hypertension.

Design and method: 102 obese hypertensive patients on average age 54.9±9.94 matched in age and sex were examined. All patients underwent clinical examination, assessment of carbohydrate and lipids metabolism and determine the level of apolipoproteins (Apo B and A-I). According to the criteria of the IDF (2005) was diagnosed abdominal obesity (AO). The patients were divided into 3 groups according to the degree of hypertension.

Results: AO was diagnosed in 80% hypertensive patients with 1st degree, in 77.36% hypertensive patients with 2nd degree, and in 84.62% hypertensive patients with 3d degree. No significant relationship between ABSI and cardiometabolic risk factors was identified in hypertensive patients with 1st degree. While positive significant correlation between ABSI and systolic blood pressure (SBP) (R=0.27; p<0.05), pulse blood pressure (PBP) (R=0.31; p<0.05) and negative significant correlation with high density lipoprotein cholesterol (HDL-C) (R=-0.31; p<0.05) in hypertensive patients with 2nd degree has been revealed. Along with this ABSI was associated with very low-density lipoprotein cholesterol (VLDL-C) (R=0.37; p<0.05), triglycerides (TG) (R=0.34; p<0.05), with levels of Apo B (R=0.38; p<0.05) and Apo B/Apo A-I ratio (R=0.34; p<0.05) in hypertensive patients with 3d degree. No significant relationships with ABSI and indicators of carbohydrate metabolism in the surveyed groups.

Conclusions: Our data suggest that ABSI is associated with hemodynamic parameters and lipid profile in obese hypertensive patients with second degree, and lipid profile and indicators lipidotransport's system in obese hypertensive patients with third degree, but is not associated with carbohydrate metabolism.

PP.LB03.11 IS A COMPLETE RIGHT BUNDLE BRANCH BLOCK WORSE THAN AN INCOMPLETE ONE?

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Objective: To evaluate the risk in terms of cardiovascular morbi-mortality imposed by an incomplete right bundle branch block in comparison to a complete right bundle branch block.

Design and method: Design, scope and primary care framework or level, selection criteria, number of included subjects, number of responding subjects and number of dropouts, interventions (if applicable), response evaluation variables and methods. Statistical analysis, limitations, ethical-legal aspects.
Retrospective cohort study.
Population: 288 patients treated in an urban healthcare centre who did not have any cardiovascular disease at basepoint, and who underwent some sort of ECG between 2000 and 2013, as a result of which a right bundle branch block (RBBB) was found.
Variables: age; gender; presence of cardiovascular risk factors (CRF): arterial hypertension, hyperlipidemia, diabetes; presence of a complete or incomplete RBBB; cardiovascular accidents (CVA): heart failure, coronary heart disease, cerebrovascular disease, auricular fibrillation; mortality.

Results: 53.5% of patients (n=153) were male, the average age was 64.26 (SD:18).69.8% (n=201) had an incomplete RBBB, whereas 30.2% (n=87) showed a complete RBBB. The average of those with an incomplete RBBB was 60.71 (SD:17.8), that of those with a complete RBBB 70.78 (SD:16.4).
13.4% (n=27) of patients with an incomplete RBBB, and 20.7% (n=18) of those with a complete RBBB suffered from some CVA, but the differences between the groups were not statistically significant (p=0,119; OR: 1,68; IC 95%; 0,87 to 3,25).
As regards the deaths, 3.5% (n=7) of patients with an incomplete RBBB died, and 11.5% (n=10) of those with a complete RBBB (p=0.008; OR: 3.60; IC 95%; 1.32 to 9.80). Adjusted for age and cardiovascular risk factors, the risk of death was 2.27 (IC 95%; 0,63; 8,14).

Conclusions: No differences were found in terms of the risk of suffering a cardiovascular accident or the risk of death between patients with a complete right bundle branch block and those with an incomplete RBBB.

PP.LB03.12 CARDIOVASCULAR MORBI-MORTALITY ASSOCIATED WITH RIGHT BUNDLE BRANCH BLOCK

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Objective: To assess the risks involved with right bundle branch block (RBBB) in cardiovascular morbi-mortality.

Design and method: Study: Retrospective Cohort.
Population: 1,531 patients treated at an urban health center who underwent an electrocardiogram (ECG) between 2000 and 2013, and who did not with present any cardiovascular disease at baseline.
Variables: Age, gender, presence of cardiovascular risk factors (hypertension (HTN), diabetes (DM), dyslipidemia), presence or absence of RBBB, mortality and cardiovascular events (CVE), such as Heart failure (HF), coronary heart disease (CHD) and cerebral vascular accident (CVA).

Results: 47.9% were male, with an average age of 63.6 years (SD: 17.6), and 19.5% had a RBBB.
Follow-up time was 5.6 years (SD 2.8, min 0.7, max 13.9).
11.1% (n = 171) patients suffered some CVE and 3.9% (n = 60) died during the follow-up time.
In comparison to patients who presented a normal ECG at all times, patients with an RBBB had an odds ratio (OR) of 1.68 of suffering a CVE (Confidence interval (CI) of 95%, 1.17 to 2.42). This risk was 1.57 after adjusting for age, gender, HTN and DM (CI 95%, 1.07 to 2.31).
The HF OR was 2.01 (CI 95%, 1.10 to 3.70), the CHD OR 1.4 (CI 95%, 0.7 to 2.8), and the CVA OR 1.14 (CI 95%, 0.6 to 2.19).
The risk of death in patients with RBBB was 1.8 (CI 95%, 1.03 to 3.23). This risk was slightly lower after adjusting for age, HTN, and DM (OR 1.7, CI 95%, 0.9 to 3,2).

Conclusions: Patients with an RBBB have a higher risk of suffering a cardiovascular event (especially, heart failure) compared to patients with a normal ECG. The risk of death was slightly higher, although not statistically significant, in patients with an RBBB.

PP.LB03.13 VALIDATION ACCORDING TO ESH INTERNATIONAL PROTOCOL OF SOMNOTOUCH NIBP, A DEVICE FOR NONINVASIVE CONTINUOUS BLOOD PRESSURE MONITORING

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Objective: Conventional 24h ambulatory blood pressure (BP) monitoring has several important limitations including discontinuous nature of BP measurements and poor acceptance by many patients due to discomfort associated with repeated cuff inflations. This discomfort may affect nocturnal sleep quality, potentially leading to spurious elevation of nocturnal BP. Somnotouch NIBP is a novel cuffless continuous BP monitor, based on pulse transit time (PTT) measurement. Aim of this study was to assess its validity in accordance with ESH International Protocol (IP), 2010 revision.

Design and method: Somnotouch NIBP (Somnomedics, Germany) estimates BP based on the PTT measurement derived from simultaneous recording of ECG and finger photoplethysmogram. Based on the arterial wall stress-strain characteristics a function was derived linking changes in transmural pressure with PTT (BP increase translates into arterial wall stiffening and PTT is consequently reduced). Validation of the device was performed according to ESH IP (comparison with ausculatory method, mercury manometer) adapted to the peculiar characteristics of the device. In particular, as the device requires initial calibration with cuff measurement, a 15 minute interval between calibration and validation measurements was introduced to verify calibration maintenance.

Results: The study included 33 patients (age range 25-78, M/F 22/11, arm circumference 20-32cm) from low, medium and high BP strata as required by IP. All validation requirements of the IP were fulfilled (Table). The device was well accepted and no major technical problems were encountered although movement artefacts remain a relevant issue as for oscillometric monitors.

Table. Summary of validation outcome. Columns A,B,C report number of differences between reference and tested devices (out of a total of 99 differences) in systolic (S) and diastolic (D) BP, for each of the 3 BP difference ranges. Columns D and E report number of subjects with 2 out of 3 (D) or 0 out of 3 (E) BP differences ≤5 mmHg. For detailed validation requirements see O'Brien E. et al. Blood Pressure Monitoring 2010;15:23-38.

Requirement:	A ≤ 5 mmHg	B ≤ 10 mmHg	C ≤ 15 mmHg	D 2/3 ≤5mmHg **	E 0/3 ≤5mmHg ***	Result
Required	*73^a or 65^b **	*87^a or 81^b **	*96^a or 93^b **	*≥ 24*	*≤ 3*	
SBP – achieved	76	91	95	28	2	PASS
DBP – achieved	93	99	99	32	0	PASS

* - two out of three criteria (columns A,B,C) must be fulfilled for threshold *a*; three out of three criteria must be fulfilled for threshold *b*

Conclusions: Somnotouch NIBP fulfils ESH IP validity requirements and represents a potentially useful option for cuffless 24 h BP monitoring with lesser interference with nocturnal sleep compared with traditional cuff-based BP monitoring methods.

PP.LB03.14 EVALUATION OF BLOOD PRESSURE RESPONSES TO TREADMILL EXERCISE TEST IN NORMOTENSIVE OFFSPRINGS OF HYPERTENSIVE PARENTS

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Objective: Hypertension (HT) is a progressive disease with a prehypertensive phase of the disease. The most important feature of this period is the abnormal cardiovascular reactivity to various stressors. Therefore, in our study, we focused on normotensive children of hypertensive parents (NCHP) which is a special group under risk and planned to evaluate these children in various age groups. To explore this issue, we studied whether or not NCHP show higher cardiovascular reactivity at different steps of exercise test and recovery period from their negative history counterparts.

Design and method: This study enrolled 110 normotensive children aged 6-18 years. Sixty-two children with parental history of hypertension formed the NCHP group while 48 without parental history formed the control group (NCNP).

Results: Gender, age, weight, height and body mass index showed no statistical difference between the groups (p>0.05). Exercise test was performed to all participants according to the Bruce protocol. Resting systolic blood pressure (SBP), stage-2 SBP, stage-3 SBP, maximal SBP and SBP at 1st, 3rd and 6th minutes of recovery period were significantly higher in the study group than in the control group (respectively p=0,001, p=0,001, p=0,009, p=0,007, p=0,02, p=0,001 and p=0,001). Maximal and submaximal heart rate and blood pressure variability according to the resting values were showed no statistical difference between the groups (p>0.05). When the age groups were compared, no statistically significant differences were found between the measurements of 6-10 age group. After 10 years of age, with begining of puberty, it was noticed that NCHP group showed significantly higher SBP levels than the control group.

Conclusions: In our study, we stated that children who are at risk of HT showed more exaggerated cardiovascular responses during the test and recovery period to physical stress created by exercise testing. This response was particularly evident after 10 years of age. Before the development of HT, identification of high risk individuals make it possible to prevent or delay the emergence of the disease by some dietary and lifestyle modifications.

PP.LB03.15 DECREASED LEVEL OF CORD BLOOD CIRCULATING ENDOTHELIAL COLONYFORMING CELLS IN PREECLAMPSIA

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Objective: Preeclampsia is a pregnancy-related disorder associated with increased cardiovascular risk for the offspring. Endothelial colony-forming cells (ECFCs) are a subset of circulating endothelial progenitor cells that participate in the formation of vasculature during development. However, the effect of preeclampsia on fetal levels of ECFCs is largely unknown. In this study, we sought to determine whether cord blood ECFC abundance and function are altered in preeclampsia.

Design and method: We conducted a prospective cohort study that included women with normal (n=35) and preeclamptic (n=15) pregnancies. We measured ECFC levels in the umbilical cord blood of neonates and characterized ECFC phenotype, cloning-forming ability, proliferation and migration towards VEGF-A and FGF-2, in vitro formation of capillary-like structures, and in vivo vasculogenic ability in immunodeficient mice.

Results: We found that the level of cord blood ECFCs was statistically lower in preeclampsia than in control pregnancies (P = .04), a reduction that was independent of other obstetric factors. In addition, cord blood ECFCs from preeclamptic pregnancies required more time to emerge in culture than control ECFCs. However, once derived in culture, ECFC function was deemed normal and highly similar between preeclampsia and control, including the ability to form vascular networks in vivo.

Conclusions: This study demonstrates that preeclampsia affects ECFC abundance in neonates. A reduced level of ECFCs during preeclamptic pregnancies may contribute to an increased risk of developing future cardiovascular events.

PP.LB03.16 HYPERTENSION AND OBESITY CO-EXIST PROBLEMS IN CHILDREN

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Objective: High blood pressure in children and adolescents is a growing health problem that is often overlooked by physicians. This study aimed to identify these risk factors for cardiovascular disease in children.

Design and method: This was a community base cross sectional study in a representative stratified and randomly selected children of urban area (6-18 years old) from 16 cities in northern Iran. Clinical and anthropometric variables and family history were taken by trained research team. Children with high blood pressure in first visit, schedule for two another visits and mean of blood pressure was recorded for them. Abnormal cutoff for blood pressure and laboratory results have been determined base on standard reference.

Results: Out of 453 children sampled, 54.1% was male and 44.4% was above 14years old. 18% children had family history of hypertension. The risk of overweight and obesity was greater in older subjects as 2.45 %, 10.1% and 20.6% in under 10 years, 10 -14 years and more than 14 years old respectively($p<0.001$). Hypertension was observed in 7.1% of children that was higher in older children.

Conclusions: These findings should be considered in preventive measures to reduce the future risk for cardiovascular diseases among children in this area.

PP.LB03.17 ONE THIRD OF TOMORROW'S DOCTORS ARE AT HIGH RISK OF DEVELOPING NON COMMUNICABLE DISEASES: A CROSS SECTIONAL STUDY AMONG MEDICAL STUDENTS FROM A DEVELOPING COUNTRY

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Objective: The objective of this study was to assess the prevalence of modifiable risk factors of major Non Communicable Diseases (NCDs) among the third year medical students of Kathmandu Valley in Nepal.

Design and method: This was a cross sectional study using a simple random sampling technique to select 3 medical colleges. All the third year medical students (n=191) from the selected medial colleges were participated in the study.

Results: In this study, 62.3% were male and 37.7% were female. The mean age of the respondents was 21.5±1.0 (sd) years. One fifth (n=39) of medical students were current tobacco users and 29.3% (56) were current alcohol drinkers. Majority (85.6%) of medical students did not consume recommended level of fruits and vegetables. One third (n=59) of medical students were involved in low level of physical activity and 42.9 %(n=82) were involved in moderate level of physical activity. A total of 7.3% (n=14) respondents did not have any risk factors considered in our analysis, 60.2% (n=115) had only one risk factor and 32.4% (n=62) had two or more than two risk factors of NCDs.

Conclusions: Almost one-third of medical students were found with two or more risk factors for NCDs showing one third of tomorrow's doctors are at high risk of developing NCDs. Considering the evidence that more risk factors put them at higher risk of non-communicable diseases; interventions are needed to change unhealthy behavior among medical students.

PP.LB03.18 EFFECT OF STOCK MARKET INDICES ON BLOOD PRESSURE CONTROL AND MORTALITY

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Objective: There exists evidence of a consistent relationship between the strength of the economy and the health of the population. There are no studies examining the relationship between stock markets and cardiovascular measures at an individual level. As blood pressure is closely linked to stress, it is plausible that fluctuations in the financial markets can have an impact on blood pressure and we hypothesise that this will have an impact on blood pressure control and outcomes in treated hypertensive patients attending the Glasgow Blood Pressure Clinic.

Design and method: Financial stress was calculated as the cumulative sum of daily FTSE-100 in 5000 units over the 7 days (FTSE-5K-7d) preceding the clinic visit, hospital admission and death. The period of study was 2001 to 2011 the period of maximum stock market fluctuations. Longitudinal BP measurements over a 4 year period at least 1 month apart and excluding the first visit BP was analysed using Generalised Estimating Equations and cause specific outcomes were analysed using binary logistic regression adjusted for relevant baseline covariates.

Results: The longitudinal BP analysis included 1030 patients and 3921 blood pressure measurements, while the outcome analysis included 865 IHD and 1913 non-IHD events. The mean age was 57(14) years, baseline BP 160/95 (26/13). The mean inter-visit interval was 2.6 (2.4) months. The average FTSE-5K-7d was 7.27(1.12). Each unit increase in FTSE-5K-7d was associated with a 1 mmHg lower SBP in addition to the 0.14 mmHg monthly SBP reduction observed in the patients. There was no significant association with diastolic BP. Each unit increase in FTSE-5K-7d was associated with reduced risk of IHD events during the study period (O.R=0.925; 95% CI=0.867. 0.987; p=0.019) and this was independent of deprivation scores.

Conclusions: We show for the first time that short term stock market fluctuation is a significant predictor of BP control and IHD events at an individual level. This suggests more intensive cardiovascular prevention measures may be required during periods of economic turmoil.

PP.LB03.19 CHRONIC FATIGUE SYNDROME VERSUS DEPRESSIVE DISEASE. HOW IMPORTANT IS BLOOD PRESSURE!

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Objective: Assessment of blood pressure in 109 patients aged between 20 and 50 years, suffering from clinical depression - depressive syndrome unspecified - evolution with less three years.

Design and method: Of 109 patients admitted, 97 (89%) were female with a mean age of 24 years ranging between 20 and 44 years old, and 82 (75,2%) had between 20 and 37 years old and the remaining 27 (24,7%) are aged overdose 44years. 101 patients (92,6%) were aware of a family history of cardiovascular risk factores (CRF), and 36 (33%) were known to have hypotension.

Results: 71 patients (65.1%) had mean values of systolic blood pressure of 92 mmHg (range between 102 and 82 mmHg) and diastolic blood pressure of 52 mmHg (ranging between 68 and 47 mmHg). The other 22 patients (20.2%) with mean values of systolic blood pressure of 110 mmHg (range between 122 And 102) with an average diastolic blood pressure of 70 mmHg (ranging between 78 And 62 mmHg). Values were confirmed by AMBP.
ECG and echocardiography are normal in all patients, verifying TILT teste positive in all 38 (53,5%) of patients screened.

Conclusions: It's very important an early differential diagnosis of Chronic fatigue syndrome (CFS) and depressive syndrome, either by immediate therapeutic requirements and to establish a proper prognosis for the patients.

PP.LB03.20 METABOLIC DISORDERS, DEPRESSIVE SYNDROME AND CARDIOVASCULAR DISEASE

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Objective: 189 patients with psychiatric depressive syndrome and metabolic changes. Therapeutic response.

Design and method: 189 patients admitted consulting with family and personal cardiovascular risk factores, metabolic changes and several years of orientation in Psichyatry.
Started treatment with serotonin reuptake inhibitors, statin, lifestyle modification, with frequent optimization and adjustment of therapy.

Results: 78% with an excellent response, gaining autonomy, adequate sleep, arterial normotension, advantages in lipidic and metabolic profile in patients aged between 20 and 35 years old, 66% of the total, of both sexes
The remaining 22% found the case patients aged 35 to 50 years of wich 92% are men and 8%women.

Conclusions: There is a statistically significant relationship beetwen depressive syndrome and cardiovascular changes in metabolism with response to therapy beetwen the diferente age groupes studied and even varying between gender.

PP.LB03.21 DEPRESSION AND CARDIOVASCULAR DISEASES. WHAT'S THE LINK?

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Objective: Evaluation methabolic and cardiovascular diseases in 189 depression patients with Psichyatric diagnosis, who we found a significant correlation between this with family cerebro, cardiovascular and Methabolic diseases.

Design and method: All the patients done a cardiovascular, clinical, anthropometric and biochymical study, and we begin the medical therapeutic with SSRI and statins and methabolic therapeutics with changes in the lifestyle after Duplex scanning and verify in follow up the Clinical evolution, cholesterol HDL and Cholesterol LDL with anothers inflamatory factors and carótide and vertebral EcoDopler.
We know from clinical, anatómical and pathophysiological observation that the disease first start in the posterolateral aspect of the bulb and, in this earliest form it Is a fibrous plaque that as a uniform and smooth covering. As the begining of the lesions progress where by the time the plaque envolves entire bulb and the origin of the external carotid artery as well

Results: We found a good response with SSRI and statins with methabolic therapeutics and lifestyle changes because 98% have rise cholesterol HDL, anothers inflamatory factors and carótide changes where we know from clinical observation that the disease first start in the posterolateral aspect of the bulb and, in this earliest form it Is a fibrous plaque that as a uniform and smooth covering. We have an excellent behaviorial response.
With this results, that depression syndrome can be predictive to Cardio and Cerebrovascular methabolic diseases, where the high-grade lesions are the most dangerous and are the ones that we most be able to detect with a high degree of accuracy.
We alloways found a good correlation between hypotension (poor iintravascular pressure) and the change properties of tha arteries as a dramatic effect in the shape of the arterial pressure waveform!

Conclusions: Depression syndrome can be predictive to Cardio and Cerebrovascular methabolic diseases, where the high-grade lesions are the most dangerous and are the ones that we most be able to detect with a high degree of accuracy.

PP.LB03.22 RELATION BETWEEN WHITE COAT EFFECT WITHIN A SINGLE VISIT AND STROKE. A CROSS SECTIONAL STUDY FROM BEIJING

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Objective: Blood pressure variability (BPV) has been identified as an important new risk factor for cardiovascular events. White coat effect (WCE), measured as the first systolic blood pressure (SBP) measurement minus the mean of the second and the third measurements, is a type of BPV within a single visit. We investigated the relationship between WCE and stroke risk in this study.

Design and method: 2972 participants who had 3 measurements of BP within one single visit were included. Participants were divided into three groups according to their WCE percentiles: Group 1 (WCE2.5-97.5, 2.5-97.5th percentiles of WCE), Group 2 (WCE2.5, 0-2.4th percentiles of WCE) and Group 3 (WCE97.5, 97.6-100th percentiles of WCE). A multiple logistic regression model was used to analyze the relationship between WCE and stroke adjusted for age and BMI groups, gender, smoking status, hypercholesterolemia, SBP, hypertension, diabetes mellitus, IMT thickening, brachial-ankle pulse wave velocity (baPWV) abnormality and carotid plaque.

Results: Traditional risk factors, such as age, gender, hypertension, diabetes, and obesity were related to stroke ($p<0.05$). CIMT thickening, carotid plaque, ba-PWV abnormality were also related to stroke ($p<0.05$). Compared to WCE2.5-97.5 group, the OR for stroke in WCE2.5 group was 2.78 (95%CI: 1.22, 6.36, p=0.015). After adjusting for age and BMI groups, gender, SBP, diabetes, hypertension, hypercholesterolemia, smoking status, cIMT thickening, carotid plaque and ba-PWV abnormality, the correlation became stronger, OR increased to 2.94 (95%CI: 1.16, 7.50, p=0.023).

Conclusions: WCE2.5 is associated with stroke independently, further studies are needed to be conducted to assess the cause and effect relationship.

PP.LB03.23 PATIENTS' ACCEPTANCE AND PREFERENCE FOR AMBULATORY BLOOD PRESSURE MONITORING IN LIMASSOL, CYPRUS

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Objective: To investigate patients' attitude towards ambulatory blood pressure monitoring (ABPM), especially after recommendation from NICE to perform ABPM in every newly- diagnosed hypertensive patient.

Design and method: We created a questionnaire, after extensive literature review, concerning ABPM acceptance, tolerance and side effects. Answers were in Likert scale (not at all, little, medium, quite a lot, very much). ABPM and Home Blood Pressure Monitoring (HBPM) were both offered to our patients. We asked which method they prefer, for follow up examination. Study population consisted of 103 patients referred to our department for blood pressure evaluation, from November 2013 until April, 2014. The device used for ABPM was Tonoport V.

Results: Patients mean age was 53.8 years (standard deviation=14.3). All patients agreed to ABPM and HBPM. None refused answering the questionnaire. One patient failed to complete ABPM. Only 30% completed HBPM, for various reasons (forgot to measure blood pressure, forgot to bring the results, did not have time to measure blood pressure). Sixty five patients (64.5%) preferred ABPM to HBPM, which was contradictive to findings from previous research. Fourteen patients (13.5%), showed equal preference to both methods and 22% preferred HBPM for reevaluation. Eighty patients (79%) experienced minimal movement restriction and only 4.5% found it quite a lot or very restrictive. Eighty four patients (83.5%) felt restriction to every-day activities and only 4.5% found it quite a lot or very restrictive. Ninety seven patients (96.5%) didn't find the noise annoying. Eighty one patients (80%) had no or little problem with sleep and 14 (13.5%) had severe problem. Seven patients (6.5%) felt like talking it off during night time and four during day time. Five (4.5%) had medium and 4.5% had more than medium pain locally. Five had medium and quite a lot irritation, none had more severe. One mentioned medium and one quite a lot of bruises. 92.5% had no or little objection to do ABPM again. Ninety-nine patients (98.5%) believed it was not a waste of time.

Conclusions: Our patients seem to prefer an once-and-for all examination, whose most serious side effect is sleep disturbance.

PP.LB03.24 INDICATIONS OF THE EXAMINATION AND RESULTS TO PATIENT'S TREATMENT AFTER ESTIMATION OF BLOOD PRESSURE WITH AMBULATORY BLOOD PRESSURE MONITORING IN LIMASSOL, CYPRUS

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Objective: We assessed the reasons to perform Ambulatory Blood Pressure Monitoring in our office and how the examination influenced treatment.

Table 1. Reason for testing and Result to treatment

Reason for testing	N %	Result to treatment	N%
First diagnosis	18,5%	Start medication	16,5%
Out of target	38,5%	Stop medication	0%
Resistant hypertension	7%	Adjust medication	43,5%
Marginal values	21,5%	Current treatment	21,5%
Suspicion for WC effect	10,5%	Avoid starting medication	9,5%
Suspicion for MH	2%	Referral to reevaluation	9%
Other reason	2%		

Table 2. Marginal values

Marginal values	N%
Start medication	9%
Adjust medication	36.5%
Current treatment	27.5%
Avoid starting medication	18%
Referral to reevaluation	9%

Table 3. First diagnosis

First diagnosis	N%
Start medication	57.5%
Avoid starting medication	5.25%
Referral to reevaluation	31.5%

Table 4. Suspicion for WC effect

Suspicion for WC effect	N %
Start medication	18%
Current treatment	36%
Avoid starting medication	36%

Design and method: One hundred and two patients were recruited, age 18 to 85, mean=53.8, SD=14.3.ABPM had been performed in the previous six months, from November 2013 until April, 2014. The patients' reason for referring was stated by their physician (first diagnosed, out of goal, resistant hypertension, marginal values, white-coat suspicion, masked hypertension suspicion, other reason). The decision to change treatment was taken based on the results of ABPM and patients' risk stratification.

Results: There were seven reasons we performed ABPM in Limassol's General Hospital outpatient department for hypertensive and this is how the exam affected treatment (t.1). 1. The most common reason (38,5%), was having office blood pressure values out of target. Twenty nine of them (74%) had their medication changed, after ABPM. Seven of them (18%) were proven to have white-coat effect and continued their medication. 2. From 22 patients (21.5%) with marginal office blood pressure values, two started medications (9%), 8 (36%) had their treatment adjusted, 6 (27%) continued their treatment, 4 (18%) avoided starting medications (18%), two (9%) were referred to reevaluation (t.2). 3. Nineteen patients (18.5%) were referred as first diagnosed with hypertension. From them, only 57.5% was started on medication and 31.5% referred for reevaluation. Only one patient had white-coat syndrome (5.25%), which is lower than knowledge from previous research (t.3). 4. From eleven patients with suspicion for white-coat effect, two (18%) were prescript medication, four (36%) continued current treatment and four avoided treatment (36%) (t.4). 5. Seven patients (6.5%) were referred for resistant hypertension. 6. Two patients were suspicious of having masked hypertension and one indeed started medication. 7. Finally, two were referred for other reason (investigation for hypotension).

Conclusions: On the whole, 44 patients (43.5%) had their treatment adjusted, based on ABPM, 10 patients (9.5%) avoided treatment and only 21.5% continued their current treatment. Ambulatory blood pressure monitoring can alter patients' treatment.

PP.LB03.25 CARDIOVASCULAR RISK FACTORS AFTER CARDIOVASCULAR EVENTS, NEGLECTED ISSUE

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Objective: Cardiovascular diseases are the first cause of death in the world and many studies revealed prognostic effect of control of risk factors after coronary events.

Design and method: In a cross sectional study, a representative sample of urban population from 16 cities in northern Iran underwent study. Represents above 20 years old were interviewed and examined by a trained research team. Then a blood sample was drawn for biochemical testing. Data analysis was done with SPSS 14 software and x^2 test was used.

Results: A total of 2028 adults aged 20-79 years were selected from the general population. 173 participants (8.5%) were known cases of cardiovascular diseases who were taking medication, with mean age of 58.7 ± 13.2 years.35.8% of cases had obesity(BMI more than 30 kg/m2) Vs 25.5% among other people(p<0.004). Central Obesity was found among 54.1% of cases and 34.3% others (p<0.000). There was not any significant differences between smoking habits between two groups(11% vs 13.3%).72.3% of the patients had at least one lipid metabolism abnormality that this rate was 46.2% among other participants(p<0.000). Blood pressure was uncontrolled in 37.3% of cases in comparison to 16.8% in others. Diabetes was diagnosed in 28.8% cases and 8.8% other persons (p<0.000).

Conclusions: This study shows that inadequate attention is paid to risk factors after cardiovascular events .An educational program about risk factors to patients is recommended.

PP.LB03.26 EFFECT OF VALSARTAN/AMLODIPINE ON BLOOD PRESSURE CONTROL RATES IN CHINESE PATIENTS WITH DIABETES, CHRONIC KIDNEY DISEASE OR AGE >80 YEARS

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Objective: To determine the blood pressure control rates based on the 2013 ESH/ESC hypertension guidelines in patients treated with valsartan/amlodipine that had diabetes, chronic kidney disease or were age >80y from the CHINA STATUS II study, and to assess adverse events (AEs) in patients stratified according to BP level.

Design and method: 1865 hypertensive patients with diabetes, 355 with chronic kidney disease and 746 who were very elderly (>80 years) from the CHINA STATUS II study were evaluated. All patients received 80/5 mg valsartan/amlodipine SPC for 8 weeks. Chi-square test and Student's t-test were used in comparison.

Results: After treatment with valsartan/amlodipine SPC for 8 weeks, BP levels significantly decreased in the hypertensive patients with diabetes, chronic kidney disease and the very elderly. Based on the most recent definition of BP control as per the 2013 ESH/ESC guidelines, 75.8% patients attained BP control rate in CSII. Control rates in patients with diabetes were 69.2%, 69.6% in patients with chronic kidney disease and 89.0% in patients aged >80y. The total number of adverse events in this patient population was 164. Patients with diabetes had fewer AEs with blood pressure ranging from 130-139/80-84 mmHg compared to those whose BP was <130/80 mmHg (0.04% vs 0.07%, p = 0.0367). Fewer adverse events were also observed in elderly patients in the higher BP range, ie., 140-150/90 mmHg compared to <140/90 mmHg (0% vs 0.09%, p<0.001). In addition, drug-related adverse events were also significantly greater in elderly patients with BP<140/90 mmHg compared to those with BP 140-150/90 mmHg (0.04% vs 0%, p = 0.1076). For patients with CKD, there was no significant difference in the incidence of adverse events in patients with BP levels 130-139/80-89 mmHg and in patients with BP levels < 130/80 mmHg (0.01% vs 0.02%).

Conclusions: According to the definitions in the 2013 ESH/ESC hypertension guidelines, the majority of hypertensive patients with diabetes, CKD and aged >80y reached their BP control rates. Fewer adverse events occurred in patients with diabetes and in those >80 years old at the less strict BP targets compared to more stringent BP goals.

PP.LB03.27 CHANGE IN SYSTOLIC BLOOD PRESSURE DURING THE FIRST WEEK OF ACUTE STROKE IS NOT ASSOCIATED WITH FUNCTIONAL STATUS AND LONG TERM MORTALITY IN THE ELDERLY

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Objective: Recently we have shown that elevated systolic blood pressure (BP) recorded by 24 hour BP monitoring (24HBPM) during the first day of acute stroke is associated in elderly patients with unfavorable outcome. We designed a study to assess, with 24H BPM, whether the change in systolic BP levels during the first week of stroke, is associated with short-term functional status and long-term mortality in elderly patients.

Design and method: We studied 150 patients with acute stroke (69 males), mean age at admission 83.6 ±5.5 years. 24H BPM was recorded within 24 hours of admission and one week after hospitalization. After 7 days, patients were assessed for functional status according to the modified Rankin Scale (mRS), and were subsequently followed for mortality up to 7.5 years (mean 1.68 ± 1.73).

Results: After 7 days, 24H systolic BP decreased from 147 ± 21 to 140 ± 20 mm Hg (P < 0.001). Functional status improved and mRS decreased from 4.2 to 3.7. During follow up, 87 patients (31 males and 56 females) had died. Mortality rate was higher in females (69% vs. 45%; p<0.01) and in patients with a history of congestive heart failure. Average systolic BP recorded by 24HBPM predicted short-term functional status and long-term mortality. The change in BP was not associated with short-term functional status and long-term mortality.

Conclusions: Despite the unfavorable effect of elevated admission 24H systolic BP in acute stroke, the change in BP during the first week of stroke is not associated with short-term functional status and long-term mortality in elderly patients.

PP.LB03.28 FUNCTIONAL AND STRUCTURAL HEART CONDITIONS ASSOCIATED WITH WHITE-COAT HYPERTENSION IN COMPARISON WITH TRUE HYPERTENSION AND NORMAL BLOOD PRESSURE STATES

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Objective: This study attempts to evaluate functional and structural cardiac states using echocardiography assessment in patients with white coat hypertension in comparison with true hypertension and normotensive conditions.

Design and method: The study population consisted of 72 individuals, aged 25 to 75 years, who were consecutively referred to the Cardiology Clinic at Shariati Hospital, Isfahan in 2013.The subjects were assigned to four groups; white-coat hypertensives (n = 20), controlled true hypertensives (n = 20), uncontrolled true hypertensives (n = 12), and a normotensive group (n = 20).

Results: Whilst the four sub-groups in the study exhibited similar gender distribution, normotensive subjects were significantly younger, but there was no discrepancy in mean age between white-coat hypertensive and other hypertensive subgroups. Univariately comparing functional and structural cardiac parameters of 'white-coat hypertensives' to other study groups revealed lower deceleration time and E' wave velocity and higher E wave velocity and left ventricular internal dimension indices compared to the other two hypertensive groups. The median of cardiac mass was higher in 'white-coat hypertensives' compared with the normotensive group (127.5 versus 101.1, $p = 0.005$). After adjustment for sex and age, the white-coat hypertensive group revealed differing results in two indices, E' wave velocity and IVST, when compared with the other three.

Conclusions: A number of features can be identified as being hallmarks of white coat hypertensives: specific functional and structural cardiac changes such as lower IVST in comparison with uncontrolled hypertensives; presence of diastolic dysfunction, which is not found in normotensives and greater cardiac mass than in normotensives, less than in uncontrolled hypertensives but closest to that of controlled hypertensives. As a result, although the prognosis for patients with white coat hypertension is not as grave as for those with true hypertension it is considerably worse than among the normal population.

PP.LB03.29 APELIN AS A MARKER OF AN INSULIN RESISTANCE IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective: Aim of investigation was to estimate a serum level of apelin in patients with essential hypertension (EH) and insulin resistance (IR).

Design and method: 94 patients (pts) with EH were examined. Clinical and laboratory methods were used. Diagnosing was done according ESH 2009 guidelines. Apelin-12 plasma levels were detected using ELISA (Phoenix pharmaceuticals).

Results: Pts were age sex matched, were divided according fasting insulin into 2 groups (1 - over 12,2 mOD/ml – 57 pts; 2 - less than 12,2 mOD/ml – 37 pts). Apelin level was significantly higher in pts with EH and IR (0,32±0,22 pgr/ml) comparing to 2gr (0,21±0,09 pgr/ml) and control (0,13±0,01 pgr/ml). Apelin correlates with IR Caro index (r=-0,38; <0,05), fasting insulin (r=0,49; <0,05). In pts of 2 gr. apelin correlates with HbA1c(r=0,52<0,05). FINDRISK questionnaire results showed significantly higher data in pts with EH and IR, means increased risk of of type 2 diabetes development.

Conclusions: Insulin resistance was estimated in 54,5%. It was accompanied by overexpression of apelin, increased risk of type 2 diabetes development, pronounced changes in lipids profile and high atherogenic index. It's possible to use apelin activity as a marker of insulin resistance in patients with essential hypertension.

PP.LB03.30 GENDER FEATURES OF LEFT VENTRICULAR MYOCARDIAL REMODELING AND THE DEVELOPMENT OF CHRONIC HEART FAILURE IN PATIENTS WITH POSTINFARCTION CARDIOSCLEROSIS

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Objective: Determine gender differences in the etiology, as well as remodeling of the left ventricle (LV) in patients with chronic heart failure (CHF) and arterial hypertension (AH).

Design and method: The study included 112 patients of both sexes, aged 45 to 60 years with CHF which were examined on the basis of Azerbaijan Scientific Research Institute of Cardiology. The patients were divided into 2 groups: 1st gr. 60 males, mean age 54,8 ± 3,3 years, and 2nd gr 52 women, mean age 55,8 ± 3,1 years. To assess cardiac hemodynamics all patients underwent echocardiography using Vivid 3 GE.

Results: According to our research leading cause of heart failure in women is 50.5% of cases of hypertension, ischemic heart disease 23.7% . While in men is the undisputed leader of CHD, forming 78.3% of CHF (80.3% in men with CHF occurred after myocardial infarction). According to our research in women more often than men CHF develops type of diastolic dysfunction (DD), and left ventricular ejection fraction remained unchanged. Since DD occurs in men at 65,8% vs 76,4% of women when $p < 0{,}05$. In the group of women was more common prognostic unfavorable remodeling - eccentric hypertrophy of the left ventricle: 68% vs. 54.5% among men ($p < 0{,}05$), concentric left ventricular hypertrophy: 21% in women vs 19,1% ($p > 0{,}05$).

Conclusions: Patients with CHF are a number of gender-specific: the prevalence of hypertension in women, and coronary heart disease in men. While in women with CHF often recorded diastolic dysfunction and characterized by the development of prognostically adverse remodeling types: eccentric and concentric LV hypertrophy.

PP.LB03.31 ARTERIAL HYPERTENSION MODELED BY IN VITRO TREATMENT OF RED BLOOD CELLS WITH TRYPSIN

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Objective: Rheological studies of erythrocyte membrane (RBC) are useful to analyze and model the microcirculatory disturbances observed in arterial hypertension (HT). Previous studies have shown that erythrocyte anionic charge (CAE) decreases affecting intercellular interactions. The aim of this study was to model in vitro the CAE decrease observed in hypertensive patients, by mean of the digestion with trypsin. At the same time, the impact of these changes in the rheological properties of the erythrocyte membrane and in the intercellular interaction mechanism was evaluated.
Using exploratory data techniques, a comparative study of hemorheological parameters of hypertensive patients with RBC normotensive donors altered by treatment in vitro with different concentrations of trypsin, was carried out in order to assess their potential contribution to the prethrtic state in these patients.

Design and method: Measurements of CAE by spectrophotometric analysis with the Alcian Blue dye were carried out to quantify the effect of trypsin on RBC. Erythrocyte aggregation kinetics was analyzed with an Erythroaggregameter determining the time required to reach 50% of maximum RBC aggregation (t50%).

Results: Results show a decrease in the CAE in erythrocytes of normotensive donors enzymatically treated ($p<0.05$) and hypertensive patients ($p<0.005$) compared to control. Similar EAC values of erythrocytes from HT and RBC treated with trypsin solution 2mg/mL were found. There was a significant decrease ($p<0.05$) in t50% with increasing trypsin concentration, yielding similar t50% values for RBCs of HT with healthy RBCs treated with trypsin solution 2mg/mL. In vitro modeling

proved to reproduce the RBC alterations in HT, establishing that 2mg/mL trypsin treatment produces similar changes to those found in this pathology.

Conclusions: The results obtained in this study indicate that alterations in the components of erythrocyte membrane by the enzymatic treatment, which has the effect of reducing in CAE, could be related to alterations present in RBC from HT. The increase in erythrocyte aggregation plays a crucial role in microcirculatory level, increasing the probability that aggregates obstruct the microcapillaries. This work represents an interdisciplinary study that allows evaluation, modeling and understanding the alterations in the erythrocyte membrane which take place in hypertension.

PP.LB03.32 HYPERTENSION IS THE MAIN FACTOR IN PATIENTS TREATED BY PCR, LONG-TERM STUDY

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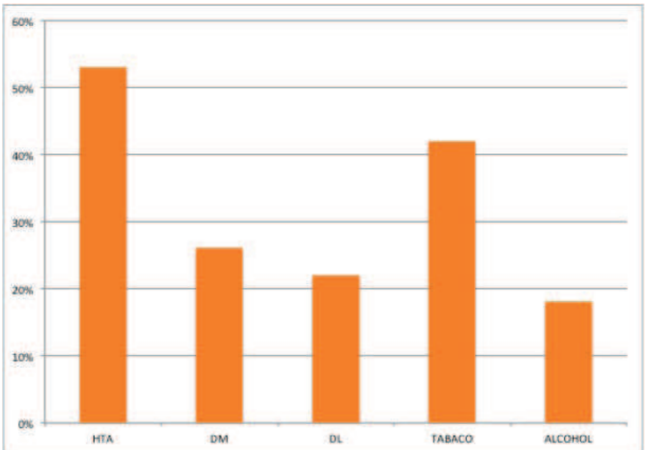
Objective: Know the main risk factors, determinants and outcomes of patients diagnosed with cardio-respiratory arrest (PCR) in our environment.



Design and method: A retrospective study of patients diagnosed with PCR is performed (on admission to hospital and / or UCI) between January 2010 until 31 December 2013 inclusive. We reviewed 453 summaries, of which only correspond to actual PCR 405 patients (89%).

Results: In 74 % of cases the etiology was cardiac ($p < 0.0131$), with 80 % PCR outpatient (home and public place) and 20% hospital, 73.8% men and 27%women, mean of 63 years. Women average 5 years older than men ($p < 0 , 059$) . Among the highlights risk factors hypertension , a major factor is found in more than half of the sample, 67 % of cases: of which 53 % of patients had been diagnosed previously, while the remaining 14 % was diagnosed during hospitalization. As the second most important risk factor is smoking 42 % of cases, followed by DM diagnosed at the time of the event, 26 % of patients and dyslipidemia present in 22% of them. Significant differences in gender were found, noting that males were more smokers and drinkers, however, had less hypertension frequently. Of all hypertensive patients, 27% were male versus 40 % female.
53% of cases had a history of previous heart disease (Coronary 25.3 %, valvular disease 10%, 5 % DCM 5% hypertrophic cardiomyopathy, congenital diseases 1%). The initial rhythm in most patients was ventricular fibrillation in 83 % of cases, compared to 20 % with asystole.

Conclusions: The main FR present in most patients with PCR is the HTA. It is confirmed that a percentage of the population is not HT aware of their condition, noting a predominance in women. The PCR has a poor prognosis in the short and medium term, occurring mainly in patients with previous heart disease, hence the importance of control of CVRF.

PP.LB03.33 RELATIONSHIP OF PULSE PRESSURE INDEX AND CAROTID INTIMA-MEDIA THICKNESS IN HYPERTENSIVE ADULTS

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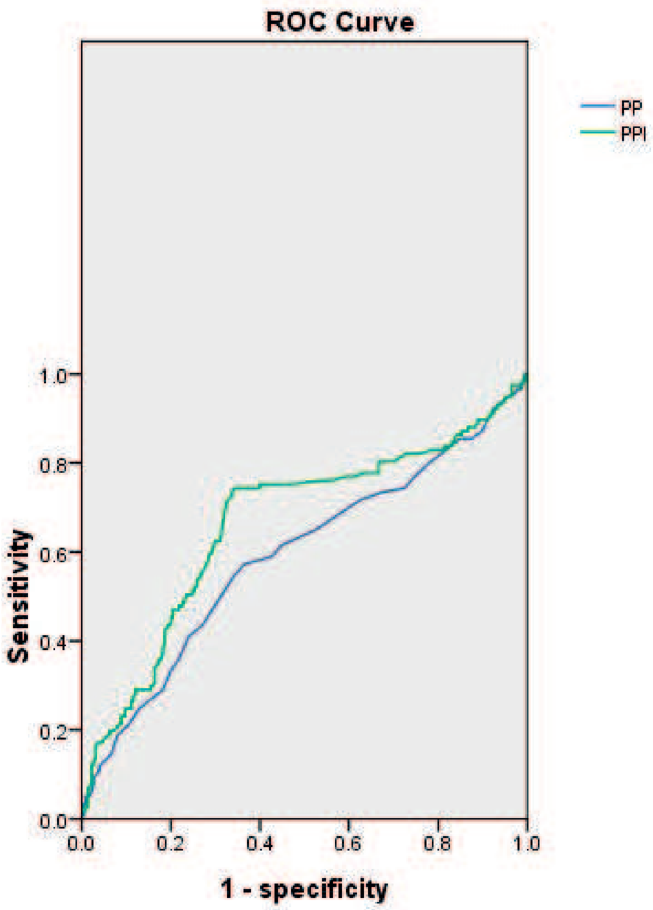
Objective: To evaluate the relationship between pulse pressure index (PPI) and carotid intima-media thickness (CIMT).

Design and method: Observational trial was design and 342 patients newly diagnosed as essential hypertension without anti-hypertensive therapy were enrolled. According to the cut-off value of CIMT, 342 participants were divided into normal (less than 0.9mm) and increased CIMT groups (equl or higher than 0.9mm). Baseline characteristics were compared, logistic regression analysis and receiver operating characteristic curve (ROC) were performed.

Results: Approximately 34.2% of participants (n=117) were with CIMT equl or higher than 0.9 mm and participants in increased CIMT group were more elderly. Diastolic blood pressure was lower in increased CIMT group than normal group (79.3±10.8 mm Hg vs 83.8±9.4 mm Hg, $P<0.001$), whereas pulse pressure (PP) (59.3±20.2 mm Hg vs 53.6±15.5 mm Hg, $P=0.004$) and PPI (0.43±0.09 vs 0.38±0.08, $P<0.001$) were significantly higher in increased CIMT group. CIMTs were 1.11±0.11 mm and 0.76±0.12 in increased group and normal group respectively ($P < 0.001$). After adjusted for the traditional risk factors for atherosclerosis such as age, smoking, body mass index, fasting blood glucose, triglyceride, LDL-C, systolic blood pressure and diastolic blood pressure, only PPI was found an independent determinant for CIMT increase, and the odd ratio was 1.644 (95% interval confidence 1.280-2.112, $P < 0.001$). The ROC evaluations showed that area under the curve for PP to predict CIMT increase was 0.591±0.034, and PPI was 0.664±0.033 (see Figure 1). PPI was more powerful than PP in discriminating CIMT increase ($P=0.006$).



Conclusions: Collectively, our study reveals that PPI is a valuable parameter for the preliminary screening of hypertensive patients who have an increased risk of atherosclerosis. In rural and remote places where echocardiography maybe not easily available, measuring PPI can provide important clues to physicians that who has already developed arterial impairment and who should undergo more thorough investigation and intensive therapy. More studies are warranted to demonstrate the predictive value of PPI for cardiovascular outcomes.

PP.LB03.34 24-HOUR AORTIC AMBULATORY BLOOD PRESSURE ASSOCIATES BETTER THAN BRACHIAL 24-HOUR AMBULATORY BLOOD PRESSURE WITH INDICES OF COMMON CAROTID ARTERY HYPERTROPHY

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Objective: Evidence suggests the superiority of aortic pressure compared to brachial pressure on the evaluation of vascular damage and prognosis of cardiovascular disease (CVD); 24-hour ambulatory blood pressure monitoring (ABPM) is regarded as the optimal method for assessing blood pressure (BP) profile. The non-invasive 24 hour aortic ABPM is now feasible and we have previously shown that 24-hour average aortic BP is associated better with left ventricular hypertrophy than 24-hour brachial BP. The aim of our study was to examine the association of 24-hour aortic and brachial ABPM with standard indices of common carotid artery hypertrophy, such as the intima media thickness (IMT) and cross sectional area (CSA).

Design and method: In 490 subjects (aged 54±13 years, 57% men, 79% hypertensives) referred for CVD risk assessment non-invasive 24-hour aortic and brachial ABPM was performed using a validated oscillometric brachial cuff-based devise (Mobil-O-Graph, IEM). Common carotid hypertrophy was assessed by high-resolution ultrasound in plaque-free segments. Linear association between BP and IMT or CSA was assessed and the Hotelling's-Williams' was used for the comparison of correlation coefficients within the same sample.

Results: The spearman correlation coefficients of systolic pressure with left/ right common carotid artery IMT and CSA are shown in the table. Comparative analysis revealed that 24-hour systolic pressure correlated significantly better than 24-hour brachial with the IMT and CSA.

Conclusions: Non-invasively assessed 24-hour average aortic pressure is strongly associated with common carotid artery IMT and CSA and better than 24-hour average brachial pressure.

Table. Spearman correlation coefficients between 24-hour brachial and aortic pressure with common carotid intimal medial thickness (IMT) and cross sectional area (CSA).

	Right IMT	Left IMT	Right CSA	Left CSA
24-h brachial SBP	0.206*	0.209*	0.255*	0.241*
24-h brachial PP	0.292*	0.235*	0.217*	0.247*
24-h aortic SBP	0.250*#	0.244*	0.309*#	0.292*#
24-h aortic PP	0.301*	0.239*	0.262*	0.288*

SBP: systolic blood pressure, PP: pulse pressure, * $p<0.001$, # $p<0.05$ for aortic versus brachial corresponding pressure using Hotelling's – Williams' T_2 test

PP.LB03.35 THE SEASONAL CHANGES OF VISIT-TO-VISIT BLOOD PRESSURE VARIABILITY IN PATIENTS WITH ARTERIAL HYPERTENSION

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Objective: The aim of study was to define the seasonal fluctuations of visit-to-visit blood pressure variability in patients with arterial hypertension (AH) in Moscow Region.

Design and method: We assessed clinical blood pressure (BP) level of AH patients (n=98) without serious concomitant diseases. We used the database of 8 studies (from 1996 until 2011), including more than 1500 measurement BP. We analyzed only those clinical BP dates that have been carried out within one season, 2-4 times in untreated patients. During the study patients completed the QL questionnaire. (J.Siegrist et all.). The mean BP (MBP) was assessed as: MBP = (1/3systolic BP)+(2/3diastolic BP). Then we calculated the arithmetic mean and SD visit-to-visit of the MBP during the 2-4 measurement BP (by M.A. Brickman method). We used ANOVA program (SAS 6.12) for statistical analysis and general Linear Model. Procedure for statistical analysis adjustment for age, sex and duration of AH and Fisher's (F) test.

Results: We obtained the following results of seasonal change of visit-to-visit variability: summer SDMBP (11,7±2,1 mm Hg) was significantly greater that winter SDMBP (6,7±1.2 mm Hg) and autumn SDMBP(6,64±1,09 mm Hg) ($p<0.05$). We found the same tendency for systolic and diastolic SDBP but the differences were not statistically significant. The VI scale scores of the QL questionnaire (level of social support of family, friends, colleagues) was associated with SDSBP (F=4,96, p<0,02).

Conclusions: In summer visit-to-visit BP variability achieve its maximum, but in winter and autumn – is lower. The quality of life scores associated with the visit-to-visit SBP variability in patients with AH in Moscow Region.

PP.LB03.36 VISIT-TO-VISIT AMBULATORY BLOOD PRESSURE VARIABILITY IS ASSOCIATED WITH DEMOGRAPHIC, SOCIAL AND PSYCHOLOGICAL FACTORS IN PATIENTS WITH ARTERIAL HYPERTENSION

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Objective: The aim of study was to define relationships between the social, psychological and demographic factors and visit-to-visit variability of the ambulatory blood pressure in patients with arterial hypertension (AH) in Moscow Region.

Design and method: We assessed 400 ambulatory blood pressure monitoring (ABPM) data (from 1996 until 2011) of AH patients (N=101) without serious concomitant diseases. ABPM monitor (Spacelabs 90207) was applied after the washout period (at 8.30-10.30 am). We defined daytime (d) period as 8.00-22.00, nighttime (n) – 0.00-6.00, evening (e) – 21.00-23.00, morning (m) – 6.00-8.00 and workplace period (w) as 11.00-19.00. Only the repeated ABPM carried out 2-4 times in 1-2 weeks were included into analysis in untreated patients The value of visit-to-visit ambulatory BP variability were determined as the average and within-patient SD (by A. Matsumoto method), separately for each period (day, night, evening, morning and workplace periods). During the study patients completed the QL questionnaire. (J.Siegrist et all.). We used General Linear Model Procedure for statistical analysis adjustment for age, sex and duration of AH and Fisher's (F) test.

Results: We found the following factors that were significantly associated with the ambulatory systolic and diastolic BP (SBP and DBP) visit-to-visit variability (SD): 1) IV scale scores of QL questionnaire (negative psychological well-being) - with SDSBPe (F=6,71, p<0,01); 2)VII scale scores (reflects the degree of ability for social contacts) with SDSBPw (F=5,01 p<0,03), SDSBPd (F=8,88, p<0,003) (negative correlation for all); 3) age with SDSBPe (F=4,66, p<0,03), SDSBPd (F=7,26, p<0,009), SDSBPw (F=4,00, p<0,05,); SDDBPd (F=4,22, p<0,04).
Thus, evening visit-to-visit variability SBP depends on the negative psychological well-being (IV scale scores), but SBP variability for day and workplace periods – on the ability for social contacts (VII scale scores). Age has been associated with the visit-to-visit ambulatory BP variability for day, workplace and evening periods.

Conclusions: The quality of life scores (negative psychological well-being, ability for social contacts) have relations with the magnitude of the ambulatory visit-to-visit variability in patients with AH. The ambulatory visit-to-visit variability increases with age.