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RELATIONSHIP BETWEEN ENDOTHELIAL DYSFUNCTION, INTIMA MEDIA THICKNESS, HYPERTENSION AND OTHER CARDIOVASCULAR RISK FACTORS IN ASYMPTOMATIC SUBJECTS

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Aim: To evaluate endothelial function and intima media thickness (IMT) in relationship with hypertension, other traditional cardiovascular risk factors (CVRF) and C- reactive protein (PCR).

Methods: We enrolled 156 patients, mean age 64 ± 11 years (M/F = 111/45). Patients underwent: anamnesis, physical examination, measurement of body weight and height and blood pressure. The following parameters were also measured: total cholesterol, HDL-C, LDL-C, triglycerides, glycemia and hs-CRP. Flow mediated vasodilatation (FMD) of the brachial artery and IMT of the carotid and femoral arteries by echo-Doppler ultrasonography was also evaluated.

Results: Patients with CVRF, compared with patients without CVRF, showed an impaired FMD ($7.1 \pm 3.6\%$ vs $9.8 \pm 4\%$, $p < 0.05$) and higher values of mean carotid IMT (1.37 ± 0.29 mm vs 1.05 ± 0.19 , $p = 0.03$). Age ($r = +.32$, $p < 0.005$), systolic blood pressure ($r = +.21$, $p < 0.05$), TC ($r = +.14$, $p < 0.05$), hs-PCR ($r = +.24$, $p < 0.005$) were directly correlated with carotid IMT, while femoral IMT was correlated with systolic blood pressure levels ($r = +.17$, $p < 0.005$), smoking ($r = +.075$, $p < 0.05$), age ($r = +.31$, $p < 0.005$) and male gender ($+0.34$, $p < 0.02$). Regarding the relationship between FMD and cardiovascular RF we observed an inverse linear correlation between age ($r = -.27$, $p < 0.005$) and systolic blood pressure ($r = -.24$, $p < 0.05$). Concerning biochemical parameters, we demonstrated that TC ($r = -.08$, $p < 0.05$), LDL-C ($r = -.09$, $p < 0.005$) and hs-PCR ($r = .23$, $p < 0.005$) were inversely correlated with FMD. Finally carotid IMT was negatively and inversely related to endothelial function ($r = +.43$, $p < 0.001$).

Conclusion: Present data indicate that hypertension and other traditional cardiovascular RF as well as elevated levels of hs-CRP are associated with impaired endothelial function and increased IMT, and that the presence of carotid IMT is significantly correlated with endothelial dysfunction.

Key Words: C Reactive Protein, Cardiovascular Risk Factors, Endothelial Dysfunction

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PROGNOSTIC IMPACT OF HYPERTENSION AND CAROTID LESIONS IN A FIVE YEARS FOLLOW-UP

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Aim: To evaluate prognostic impact of carotid lesion (CL) and arterial hypertension (AH) on cardiac and cerebrovascular adverse event (AE).

Methods: From a database of 668 patients we studied 236 hypertensives (H)(M/F=109/127), mean age 64 ± 10 years and 236 normotensives (N), matched for sex and age. All patients underwent complete physical examination, a carotid arteries echo-Doppler ultrasonography and blood measurement of glycaemia, complete lipid asset, fibrinogen (F) and high sensitivity C-reactive protein (hs-CRP). Patients were classified according to ultrasound data in: a) normal subjects; b) patients with intima-media thickening (IMT); c) patients with atherosclerotic carotid plaque (CP). Patients were asked about symptoms or previous history of coronary artery disease, and were followed up for a period of five years.

Results: If compared to N, H were, more frequently diabetics (35% vs 17%, $p < .0001$), obese (if with a BMI > 30 : 28% vs 13%, $p < .005$) and

with a family history of cardiovascular disease (64% vs 52%, $p < .05$). Moreover H had an higher prevalence of CL (IMT or CP) compared with N (ANOVA: $p < 0.01$). They more frequently experienced AE (25% vs 17%, $p < .05$) especially if they had a family history of CVD (76% vs 59%, $p < .05$) or they were older (67 ± 9 vs 63 ± 10 y.o., $p < .05$). Increased levels of trygliceride TG (138 ± 80 vs 116 ± 50 mg/dl, $p < .01$), F (340 ± 87 vs 311 ± 76 mg/dl, $p < .05$), hs-CRP (0.64 ± 0.15 vs 0.53 ± 0.21 mg/dl, $p < .005$) were related with an increased risk of AE. Patients with CP were also at higher risk of AE (61% vs 34%, $p < .05$). AH ($p < .05$, $r = +0.111$), older age ($p < .01$, $r = 0.11139$), increased levels of TG ($p < .01$, $r = +.141$), F ($p < 0.005$, $r = 0.163$) and hs-CRP ($p < 0.05$, $r = 0.103$), were predictors of AE events during the follow up.

Conclusion: H had a higher prevalence of CL, diabetes and obesity, compared with N. AE events occurred more frequently in H during the follow up as well as in those patients with higher levels of F and hs-CRP. Our study underlines the importance of evaluating global cardiovascular risk and intervening with primary prevention strategy in H patients not only to reduce blood pressure values but also for the prognostic benefits that we may obtain beyond that. The evaluation of inflammation markers may be an important tool for the detection of global CV risk.

Key Words: Adverse Cardiac Events, Arterial hypertension, Carotid Lesions

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COHERENT POLARIMETRY MICROSCOPY: A NEW DIAGNOSTIC TECHNOLOGY

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In recent years coherent polarimetry microscopy (CPM) became widely used in military and space innovations as a diagnostic remedy. According to current concepts of histological nature of bioobjects their structure can conceived as multifractal. The fractal nature of the majority of biological tissues stimulates creation and implementation of new optical methods in diagnostics and analysis of biological properties. The object of this research is to study the complex of polarization parameters of the laser radiation scattered by system of the hypertensive humans' blood formed elements, plasma, heart tissue and blood vessels.

He-Ne laser radiation with the wavelength of $0.6328 \mu\text{m}$ by means of collimator transforms into a collimated beam, then passing through linearly polarized plane, quarter-wave phase shifting plane with optical axis oriented at the angle of 45° to the polarization plane of laser radiation. As a result a circular polarized wave is formed with ability to change polarization azimuth without changing the intensity and frequency/coherence. Digital microcam and respective software is used.

Data obtained at the study showed that the images of blood, even for co-axial and crossed polarizers and analyzers, aren't coherent: non-zero intensity areas are observed. By means of additionally performed quantitative studies of speckle polarization states formed by individual erythrocytes, thrombocytes, leucocytes and monocytes we concluded: correlation zones that correspond to erythrocytes are polarized elliptically; biospeckles of the boundary field, corresponding to thrombocytes are also polarized elliptically, but level of their ellipticity is considerably smaller; ensembles of leucocytes/monocytes are practically linearly polarized; the character of the distribution of azimuth values and polarization ellipticities is random. Polarizing features of heart tissues and blood vessels are even more remarkable as every layer consists of optically different and differently oriented microstructures. Pathology involving arterial structures is usually accompanied by the sufficient enlargement and disorientation of intima structures while inner layers became more anisotropic.

Decades passed since Doppler introduced his phenomenon, but modern angiology is impossible to imagine without this "routine" technique.