

is an important step toward precision diabetology, as uniform diagnostic criteria often mask distinct pathophysiological subtypes. The aim of this study was to identify distinct metabolic sub-phenotypes in GD based on insulin sensitivity and beta-cell secretory capacity.

Methods: Study included 90 pregnant women who underwent 75 g 2-hour OGTT between 24–28 weeks of gestation. Based on the results, participants were divided into groups: Group A (GD, $n = 50$) and B (NGT, $n = 40$). We analysed maternal age, pre-conception BMI, and family history of type 2 diabetes (T2D). To evaluate metabolic profiles, the Matsuda Index (MI) and Strumvoll 2 Index (S2I) were used as markers of insulin sensitivity and secretion.

Results: Age did not differ significantly between the study groups (Group A: 34.78 ± 0.82 vs. B: 31.36 ± 0.79 years; $p = 0.396$). However, group A showed a significantly higher pre-conception BMI (26.47 ± 0.82 vs. 22.48 ± 0.25 kg/m²; $p < 0.01$) and higher prevalence of family history of T2D (64.7 % vs. 30 %; $p < 0.001$). Metabolic assessment showed Group A had significantly lower MI: 3.25 ± 0.34 vs. 6.55 ± 0.67 ; $p = 0.01$ and reduced S2I: 289.93 ± 3.29 vs. 806.47 ± 4.54 ; $p < 0.01$. To explore heterogeneity, Group A was stratified into clusters using the 25th percentile thresholds for MI and S2I within the GD cohort. Cluster 1 (resistant, 13.2 %) was defined by MI ≤ 2.0 , Cluster 2 (Secretory Deficit) by S2I < 275.0 and 3 as mixed phenotype (29.7 %). Differences were observed across clusters in pre-conception BMI (Cluster 1: 26.8 vs. 2: 24.1 vs. 3: 25.4 kg/m²; $p = 0.009$) and insulin sensitivity (MI: 1.81 vs. 4.98 vs. 3.01; $p < 0.001$). Structural differences via S2I approached significance (Cluster 1: 296.7 vs. 2: 274.0 vs. 3: 288.4; $p = 0.054$).

Conclusion: Our study confirms GD is highly heterogeneous condition, characterised by distinct metabolic sub-phenotypes driven by varying degrees of insulin resistance and secretory failure. In line with this, recognising these clusters particularly high-BMI resistant phenotype represents vital step toward precision medicine and more personalised treatment in GD.

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Artificial intelligence-based retinal screening for cardiometabolic prevention: a 3-month real-world evidence study

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Aims/Hypothesis: Overweight, obesity, and type 2 diabetes (T2DM) increase the risk of microvascular complications, including diabetic retinopathy (DR). AI-based retinal screening may enable early detection of retinal damage and support cardiometabolic prevention. This study aimed to assess the prevalence of positive AI-based retinal screening and its association with glycaemic and vascular parameters in a real-world prevention setting.

Methods: During a 3-month period, 301 consecutive adults with overweight, obesity, or T2DM were recruited. All participants underwent comprehensive cardiometabolic assessment including anthropometric measures, fasting glucose, HbA_{1c}, carotid intima-media thickness (cIMT), carotid stenosis, and flow-mediated dilation (FMD). Retinal screening was performed using the Airen AI system. Statistical analyses included ANOVA and multivariate logistic regression.

Results: Only 42 patients (the 14 %) resulted positive at the retinal screening (RS+), and a subsequent visit with the ophthalmologist confirmed the retinal alteration in all. RS+ prevalence increased progressively with worsening glycaemic status: from 21 % (fasting glucose < 100 mg/dl) to 29 % (between 100 and 125 mg/dl) to 50 % (≥ 126 mg/dl), and from 10.3 % (HbA_{1c} < 5.7 %) to 20 % (between 5.7 % and 6.5 %) to 69 % (HbA_{1c} > 6.5 %), $p < 0.001$ for both. Significant trends were also observed across vascular and endothelial parameters, with RS+ rates increasing across cIMT categories, from 26.8 % (< 0.75 mm) to 34.1 % (0.75–0.85 mm) to 39.1 % (> 0.85 mm) ($p < 0.001$), and decreasing across FMD categories, from 52.8 % (< 20 %) to 27.8 % (20–30 %) to 19.4 % (> 30 %) ($p < 0.001$). At multivariate logistic regres-

sion, RS+ was independently associated with HbA_{1c} (OR 2.29; 95 % CI 1.65–3.17; $p < 0.001$), carotid stenosis (OR 1.06; 95 % CI 1.03–1.09; $p < 0.001$), and fasting glucose (OR 1.02; 95 % CI 1.01–1.03; $p < 0.001$).

Conclusions: Retinal positivity strongly reflects glycaemic burden and systemic vascular dysfunction. Integrating AI retinal assessment into cardiometabolic prevention programmes may enable timely interventions and support comprehensive cardiovascular risk management.

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Association between intake of food groups and all-cause mortality in diabetes subgroups: a prospective cohort study from the UK Biobank

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Background and Objective: Individuals with type 2 diabetes (T2D) are at increased risk for all-cause mortality, and risk may differ by diabetes subgroups. Therefore, this study aims to investigate the association between the intake of pre-selected food groups and all-cause mortality in people with diabetes and in diabetes subgroups.

Methods: We included 4290 participants with T2D from the UK Biobank with at least 2 available 24-h dietary recalls. Pre-selected food groups included vegetables and fresh fruit, potatoes, nuts, whole grains, dairy, and red meat. Hazard Ratios (HRs) with 95 % confidence intervals (95 % CIs) were estimated per serving size/day using multivariable Cox proportional hazard models. Separate analyses were performed for diabetes subgroups defined by HbA_{1c} (≥ 48 vs. < 48 mmol/mol), waist circumference (≥ 102 vs. < 102 cm for men and ≥ 88 vs. < 88 cm for women), and diabetes duration (≥ 10 years vs. < 10 years).

Results: During a mean follow-up of 11.4 years, 602 deaths occurred. An increase of 1 serving/d of vegetables and fresh fruit (HR 0.96, 95 % CI 0.92; 1.00), nuts (HR 0.92, 95 % CI 0.86; 0.97), and whole grains (HR 0.97, 95 % CI 0.94; 1.00) was inversely associated with all-