Prevalence of preeclampsia and uterine arteries doppler examination in women with gestational diabetes mellitus with abnormal fasting, post-load or combined glucose values on oral glucose tolerance test

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Objective
Aim of the present study is to assess the effect of different gestational diabetes mellitus (GDM) phenotypes, based on the results of the oral glucose tolerance test (OGTT), on the prevalence of preeclampsia and on the uterine arteries pulsatility index (UtA PI) throughout the pregnancy.

Methods
This was a prospective study that included pregnant women who presented in our clinic in order to undergo the first-trimester, second trimester and third trimester scans as part of the routine obstetrical care in Greece. In all the scans the uterine artery pulsatility index was determined and was transformed into the multiples of median (MoMs) for the first trimester and into percentiles for all the trimesters. All pregnant women underwent a 75gr two-hour Oral Glucose Tolerance Test at 24-28 weeks of gestation and diabetes was diagnosed by the IADPSG criteria. Based on the results of the OGTT three phenotypes were identified. 1) Abnormal fasting (only the fasting blood glucose was abnormal), 2) Abnormal post-load (abnormal blood glucose either in one or two hours of the OGTT and normal fasting blood glucose), 3) Combined (abnormal fasting and abnormal post-load blood glucose, either in one or two hours of the OGTT) The diagnosis of preeclampsia was established in the presence of new onset of hypertension (systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg) and proteinuria (300mg/24 hours) or the new onset of hypertension and significant end-organ dysfunction with or without proteinuria after 20 weeks of gestation in a previously normotensive patient. Women with preexisting diabetes mellitus, chronic hypertension or twin pregnancies were excluded from the study.

Results
6928 women included in the study. 5,274 women had uncomplicated pregnancies, 1654 developed GDM and 405 developed preeclampsia. 546 women with GDM were included in the fasting group, 781 in the post-load group and 327 in the combined group. Prevalence of preeclampsia in the fasting, post-load and combined groups, were 17.9% (98/546), 26.8% (209 / 781) and 30% (98 / 327) respectively (p<0.001). Cases with preeclampsia were then removed, in order to eliminate their confounding effect on UtA PI. In the first trimester, the average MoM of UtA PI was 1.17±0.31 in the uncomplicated pregnancies, 1.15±0.31 in the fasting group, 1.14±0.30 in the post-load group and 1.13±0.31 in the combined group. The correlation between the UtA percentiles and gestational age was -0.086 in the uncomplicated pregnancies, -0.019 in the fasting group, -0.052 in the post-load group and 0.034 in the combined group. The differences in the correlations between uncomplicated pregnancies and combined group was significant.

Conclusion
GDM pregnancies with combined fasting and post-load abnormal blood glucose at OGTT, present with higher prevalence of preeclampsia and different UtA PI percentile trajectories throughout the pregnancy compared to uncomplicated pregnancies.