



Impact of overweight and obesity on the fetal cardiac function parameters in the second and third trimesters of pregnancy

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Objective

To assess the impact of overweight and obesity in the second and third trimesters of pregnancy on the fetal cardiac function parameters.

Methods

We performed a prospective cohort study with 374 singleton pregnant women between 20w0d and 36w6d who were divided in three groups: 140 overweight (body mass index (BMI) ≥ 25 kg/m² and < 30 kg/m²), 80 obese (BMI ≥ 30 kg/m²) and 154 controls (BMI < 25 kg/m²). Fetal left ventricle (LV) modified myocardial performance index (Mod-MPI) was calculated with the following formula: (isovolumetric contraction time + isovolumetric relaxation time)/ejection time. Spectral tissue Doppler was used to determinate LV and right ventricle (RV) myocardial performance index (MPI'), peak myocardial velocity during systole (S'), early (E') and late diastole (A'). These three groups were compared using the Kruskal–Wallis and Chi-square (χ^2) tests.

Results

We identified significant differences between the groups regarding maternal age ($p < 0.001$), maternal weight ($p < 0.001$), BMI ($p < 0.001$), number of pregnancies ($p < 0.001$), parity ($p < 0.001$), gestational age ($p = 0.013$) and estimated fetal weight ($p = 0.003$). Pregnant women with overweight showed higher LV Mod-MPI (0.046 vs 0.044 msec, $p = 0.009$) and LV MPI' (0.50 vs 0.47, $p < 0.001$) than the control group. Obese pregnant women showed higher RV E' than control (6.82 vs 6.33 cm/sec, $p = 0.008$) and overweight (6.82 vs 6.46 cm/sec, $p = 0.047$) groups. There were no differences in the 5th min Apgar score < 7 , neonatal intensive care unit admission, hypoglycemia and hyperglobulinemia between the groups.

Conclusion

We observed fetal myocardial dysfunction in overweight and obese pregnant women with higher LV Mod-MPI, LV MPI' and RV E' compared to fetuses from pregnant women with normal weight.