

## **Impact of gestational diabetes mellitus and chronic metabolic inflammation on fetal cardiac function**

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### **Objective**

Gestational diabetes mellitus (GDM) has emerged as an important public health issue worldwide. An increased prevalence has been noted since the last decade due to impaired nutritional status in women of childbearing age as well as chronic metabolic inflammation, rising in obesity and changing in diagnostic criteria. The objective of the study is to evaluate the correlation between blood sugar levels and chronic metabolic inflammation in mothers diagnosed with GDM and changes in cardiac geometry and contractility by two dimensional speckle tracking technology.

### **Methods**

A prospective cohort study was conducted from December 2020 to August 2022 in a tertiary care teaching hospital in Timisoara, Romania. A total of 95 pregnant women who were found to be at high risk for developing gestational diabetes mellitus at the 12 week assesment using the FMF criteria, were also screened for chronic metabolic inflammation using high sensitivity CRP, triglycerides and LDL cholesterol levels for assesment. At 24 weeks gestation we tested the patients for GDM, by impaired oral glucose test, resulting in 62 cases of gestational diabetes mellitus. The control lot consisted of 70 patients who were found to be at low risk for GDM and had normal triglycerides, LDL cholesterol and high sensitivity CRP. Fetal cardiac function was assesed in both study and control cases analyzing a four-chamber 3s cine loop using Fetal Heart Quantification software on a Voluson E8 BT19 Ultrasound System, at 30 and 34 weeks gestation. Global sphericity index (GSI), global longitudinal strain (GLS), fractional area change (FAC), 24 segment end-diastolic diameter (EDD), fractional shortening (FS) and sphericity index (SI) were the cardiac indices calculated for both ventricles.

### **Results**

Significant changes were noticed in right ventricular FAC, FS and EDD in fetuses exposed to GDM and impaired maternal metabolic status. (-1SD,  $p < 0.05$ ). No significant changes were noticed for the oher analysed indices, for either ventricle.

### **Conclusion**

Exposing fetuses to gestational diabetes mellitus and chronic metabolic inflammation leads to impaired right ventricle contractility.