Hemodynamic evaluation in patients with type 1 diabetes mellitus in pregnancy

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DOI: 10.36129/jog.2022.S44

Objective. Type 1 diabetes mellitus (T1DM) increases the risk of fetal and maternal complications during pregnancy. Maternal hemodynamic maladaptation appears to underlie the pathogenesis of preeclampsia and fetal growth restriction; however, data on hemodynamics characteristics during pregnancy in diabetic women are limited.

The aim of our study was to compare maternal hemodynamic adaptations in pregnancies complicated by T1DM *versus* normal pregnancies.

Materials and Methods. A prospective case control study was conducted, comparing 47 singleton pregnancies complicated by T1DM and no other pregnancy comorbidities and 128 controls referred to our Unit from 2018 to 2021. Hemodynamic assessment was performed in both groups by Ultra Sonic Cardiac Output Monitor (USCOM) in four gestational age intervals: 14-20, 20-28, 28-34, > 34 weeks. We evaluated six hemodynamic parameters: cardiac output (CO), stroke volume (SV), cardiac index (CI), total vascular resistance (TVR), inotropy index (INO) and potential to kinetic energy ratio (PKR).

Results. The T1DM group had significantly lower values of CO, SV, CI and INO already at the first evaluation and until term; TVR and PKR were not significantly different in the early second trimester but were higher from 20-28 weeks until term.

Conclusions. T1DM women have a hemodynamic maladaptation to pregnancy. This condition could unmask a state of subclinical impairment of maternal cardiac function at conception. However, although T1DM patients have an unfavorable hemodynamic status from the beginning, neonatal outcomes are good thanks to a good glycometabolic compensation during all the pregnancy.