Background

Modern echocardiography includes cardiac morphological and functional investigation using Tissue Doppler Index (TDI) and strain, which verify ventricular function. Fetal growth restriction (FGR) impacts fetal cardiovascular system.

The aim of this study is to verify maternal cardiac performance in pregnancies complicated by FGR and to identify the relationship between fetal growth and ventricular function.

Materials and Methods

It is a cross sectional study, released between 2016 and 2018, in the Department of Women's and Children's Health, University of Padua. The median of the gestational week at enrollment was 35 gestational weeks. "FGR" is defined according to the Delphi classification; Small for Gestational Age (SGA) is defined as an estimated fetal weight between the 3rd and 10th percentile with normal maternal and fetal hemodynamics. Controls were recruited among Adjusted for Gestational Age (AGA) at term.

Results

In total 50 patients were enrolled: 20 FGR fetuses, 10 SGA and 20 AGA controls. In patients with FGR no reduction in cardiac output (p = 0.914) and stroke volume were found. However, there is a reduction in the Global Longitudinal Strain (FGR -20.01 vs AGA -22.00, p <0.05) compared to controls (Figure 1). The Global Longitudinal Strain in FGR mothers is correlated with the percentile of the fetal abdominal circumference (p <0.05). Furthermore, maternal ejection fraction measurement correlates significantly with fetal birth weight percentile (p 0.02). SGA mothers' cardiac parameters do not have statistically significant differences with AGA mothers.

Conclusion

There is a subclinical reduction of ventricular function in pregnancies complicated by FGR; these results are not evident in mothers with pregnancies complicated by SGA. Finally, maternal functional parameters correlate with fetal biometric parameters.