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Impact of maternal stress assessed by PSS-10 score on fetal cardiac performance and structure between 24–28 weeks' gestation



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99

Singleton pregnancies



24–28

Weeks' gestation



PSS-10

Perceived Stress
Scale



Samsung
HERA Z20

Ultrasound system



OBJECTIVE

To assess the effect of maternal stress on fetal cardiac structure and function.



METHODS

- Prospective study.
- 99 singleton pregnancies.
- Gestational ages: 24–28 weeks.
- Maternal stress assessed using the Perceived Stress Scale (PSS-10).
- Ultrasound performed using Samsung HERA Z20.
- Fetal cardiac performance and structure evaluated: septal thickness, sphericity index, TEI index, Simpson ejection fraction, stroke volume, and McGoon index.
- Parameters obtained during the same examination period and analyzed according to maternal PSS-10 score values.



KEY RESULTS



Interventricular septal thickness increased with higher stress

$p = 0.001$



Sphericity index decreased with higher stress (altered ventricular geometry)

$p = 0.001$



TEI index increased

$p = 0.004$



Simpson ejection fraction increased

$p = 0.04$



Stroke volume showed no significant effect

$p = 0.32$



McGoon index decreased in women with high stress

$p = 0.002$



Elevated maternal stress is linked to measurable structural and functional cardiovascular adaptations and suggests early myocardial performance impairment.



CONCLUSION

Maternal stress, as measured by the PSS-10 score, significantly influences fetal cardiac morphology and function at mid-gestation.

Mid-pregnancy echocardiographic evaluation may help identify early intrauterine cardiovascular remodeling in fetuses exposed to maternal stress.

