The Influence of Maternal Health on Fetal Cardiac Function during Second Trimester

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OBJECTIVE: To identify maternal health factors influencing fetal cardiac function, including maternal age, body mass index (BMI), gestational diabetic mellitus (GDM), gestational hypertension (GH), abnormal thyroid function, virus infection history and in vitro fertilization (IVF).

METHOD: This is a Cross-sectional, case control study. A total of 329 mothers who presented antenatal clinical were enrolled at 21 to 28 gestational weeks (mean 22.78 ± 1.13 weeks) from 01/01/2018-30/04/2018. Fetal cardiac function related indexes were collected and compared among different case-control groups.

RESULTS: Maternal GDM and GH led to dysfunction in the left and right fetal ventricles, even well controlled. Abnormal thyroid function mainly led to alterations in the mitral peak velocity of early diastolic wave (MVE) and of later diastolic wave (MVA). Although older maternal age caused most cardiac function index to worsen, only MVE/A decreased along with maternal age after adequate and well controlled analysis. Virus infection history led to an increase in MVE in the fetal heart. A strange finding was that the fetuses of overweight women (BMI between 24 to 28) had worse cardiac function than those of obese women (BMI>28) and normal women (BMI<24). IVF had no influence on fetal cardiac function.

CONCLUSIONS: Maternal health has a profound influence on fetal cardiac development and proper cardiac function as early as second trimester. Assessment of fetal cardiac function may be important for monitoring intrauterine fetal status and predicting outcomes,