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Assessment of fetal cardiac function with maternal hypertension: Fetal echocardiography study

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Background: Maternal hypertension may result in significant maternal, fetal and neonatal morbidity and mortality.

Aim: To study the effects of maternal hypertension with their complications on human fetal cardiac function.

Methods: A prospective study included 59 singleton pregnancies with hypertension (gestational age ranging from 22-30 weeks). The diagnosis of maternal hypertension was based on clinical criteria. We classified our cases into three groups. Group I consisted of 38 preeclamptic. 14 pregnant women diagnosed with chronic hypertension in group II and in group III, seven pregnant women diagnosed as pregnancy induced hypertension (PIH). Each group was sub-classified into mild or severe form of hypertension. Umbilical artery indices were calculated, resistance index (RI), S/D ratio. Complete fetal echocardiographic examination and Tei Doppler index were calculated. The control group consisted of 25 normal singleton pregnancies.

Results: Our results demonstrated that there were a highly significance in both S/D ratio and RI in mild preeclampsia (3.6 ± 0.5 & 0.59 ± 0.5 respectively) and in severe form of preeclampsia RI was 0.68 ± 0.6 and S/D ratio was 4.2 ± 0.6 . Both were statistical significant and in severe type of chronic hypertension (S/D ratio 5.0 ± 0.4) & (RI 0.69 ± 0.5). Global fetal cardiac dysfunction (both right and left ventricular dysfunction) was found in severe form of preeclampsia Tei Doppler index (TI) for left ventricular (LV) was 0.69 ± 0.09 , right ventricular (RV) was 0.76 ± 0.05 and in severe type of chronic hypertension (TI of LV 0.74 ± 0.7 & TI of RV 0.76 ± 0.05). RV dysfunction was presented in mild preeclampsia (TI 0.56 ± 0.06). Intrauterine growth retardation (IUGR) was found highly significant ($p<0.0001$) with severe preeclampsia (83%) and in severe chronic hypertension (100%).

Conclusion: We concluded that maternal hypertension especially a severe form of preeclampsia and chronic hypertension had a significant global fetal cardiac dysfunction and significant of umbilical artery indices.

Recommendation: The clinical significance of fetal cardiac disturbances with maternal hypertension must be addressed in the future studies.

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