EVALUATION OF FETAL MYOCARDIAL PERFORMANCE INDEX IN EARLY- AND LATE-ONSET PRE-ECLAMPSIA

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INTRODUCTION

Preeclampsia ranks as one of the leading causes of maternal mortality, significant maternal morbidity, and negative neonatal outcomes worldwide. Placental-mediated disease including preeclampsia originates from a particular pathophysiological event in the first trimester associated with placental maladaptation and inadequate vascular remodeling of the spiral arterioles. Impaired trophoblastic invasion of maternal spiral arteries in cases of preeclampsia increases vascular resistance in uteroplacental circulation and may affect fetal cardiac function by causing increased cardiacafterload. The myocardial performance index is a doppler index of combined systolic and diastolic ventricular myocardial performance. It has been proposed as a potential useful predictor of global cardiac function.

AIM OF THE WORK

The aim of this study was to evaluate the myocardial performance index of the left side of the fetal heart in early- and late- onset pre-eclampsia and to compare it with normotensive pregnancies.

SUBJECTS AND METHODS

This case control study was conducted on 60 pregnant women with gestational age: 28-40 weeks, 30 of them were cases (preeclamptic group) and 30 were controls (normotensive group), the preeclamptic group was further subdivided into early onset preeclamptic subgroup (20 cases) (8 of them were IUGR while 12 of them were not IUGR) and late onset preeclamptic subgroup (10 cases) (All of them were not IUGR). The cases were recruited from the antenatal care clinic of Elshatby University Hospital, after approval of the local ethical committee and after informed consent, All patients were subjected to complete history taking, complete general and obstetric examination and then ultrasound fetal assessment was done that included: fetal biometry, estimated fetal weight, umbilical artery doppler, middle cerebral artery doppler, left myocardial performance index (MPI).

RESULTS

Table 1: Comparison between the studied groups according to MPI

MPI	Early onset (without IUGR)		Early onse t (with IUGR)		Late onset (no IUGR)	
	Cases (n = 12)	Control (n = 12)	Cases (n = 8)	Control (n = 8)	Cases (n = 10)	Control (n = 10)
Min. – Max.	0.33 – 0.69	0.35 – 0.55	0.38 – 0.64	0.39 – 0.58	0.32 – 0.63	0.38 – 0.53
Mean ± SD.	0.49 ± 0.11	0.47 ± 0.06	0.50 ± 0.09	0.48 ± 0.07	0.47 ± 0.11	0.45 ± 0.06
Median (IQR)	0.48 (0.40 – 0.56)	0.45 (0.43 – 0.53)	0.53 (0.42 – 0.56)	0.47 (0.42 – 0.53)	0.48 (0.37 – 0.55)	0.43 (0.39–0.51)
t	0.614		0.690		0.546	
p	0.546		0.501		0.592	

Table 1:
reveals that regarding MPI, there was no statistically significant difference between the early onset and the late onset preeclamptic groups.

Table 2: Comparison between the preeclamptic cases and controls according to MPI

MPI	Cases (preeclamptic) (n =30)	Control (normotension) (n =30)	t	p
Min. – Max.	0.32 – 0.69	0.35 – 0.58	1.075	0.288
Mean ± SD.	0.49 ± 0.10	0.46 ± 0.06		
Median (IQR)	0.48 (0.38 – 0.56)	0.45 (0.42 – 0.52)		

Table 2:
reveals that collectively, MPI was higher in preeclamptic group than in control group, but this difference was not statistically significant.

CONCLUSION

In conclusion, our study revealed no statistically significant difference between early onset and late onset preeclamptic groups regarding myocardial performance index. The use of MPI together with the MCA Doppler, UA Doppler, cerebro-placental ratio and biochemical markers of preeclampsia, may further increase its sensitivity in early detection of fetal distress which necessitates the design of new monitoring models and to test them. Further studies are needed for evaluation of myocardial performance index in cases with early - and late-onset preeclampsia and to follow up these cases for evaluation of their perinatal outcomes and assessment of MPI in these neonates after birth.