



Survey the Echocardiographic Findings in Fetus with Cardiac Arrhythmia

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Abstract

Introduction: Fetal cardiac arrhythmia includes tachyarrhythmias, bradyarrhythmias, and ectopia. The study aimed to examine the findings of fetal cardiac arrhythmia echocardiography.

Method: In a cross-sectional study, the fetal echocardiography was performed by a pediatric cardiac cardiologist for pregnant women with fetal cardiac arrhythmia referred to the pediatric cardiac clinic in Sari (north of Iran) at 2013. Results of echocardiography, mother's age, number of pregnancy, family history of heart disease were recorded and statistically analyzed.

Results: 60 pregnant women were included in the study. 6 mothers were less than 21 years, 51 mothers between 21 and 35 years and 3 mothers were over 35 years old. Arrhythmias include: premature atrial contractions (PAC) in 45 patients, supraventricular tachycardia (SVT) in 7 patients, bradycardia in 5 patients and flutter in 3 patients. Echocardiography was abnormal in 6 patients including hydrops in 4 patients and Transposition of the great arteries (TGA) in 2 patients. No significant difference was observed between mothers' age, gestational age and family history of heart disease in those who had normal Echography and patients who had abnormal Echography ($P > 0.05$). Number of pregnancy has a significant but weak relation with abnormal echography ($r: 0.347$, $P = 0.004$). Also, a significant weak relation was observed between arrhythmia and results of echocardiography ($r: 0.325$, $P < 0.0003$).

Conclusion: More parity and presence of arrhythmia such as SVT or bradycardia is more associated with the results of abnormal echocardiography in pregnant women.

Key words: Arrhythmia, Fetus, Cardiac echocardiography

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1. Introduction

Congenital heart diseases include cardiac structural or functional disorders that babies are born with it. These diseases are responsible for death in the first year of life, especially in developed countries and require special medical care. Cardiac congenital diseases cannot be usually preventable, but we can reduce the risk of having a baby with heart problems before and during pregnancy (1-3).

Several physiological and pathological processes can be effective on fetal heart rate variability. So that after 30 weeks of pregnancy, increased fetal activity will be associated with increased heart rate variability. Normal fetal heart rate is between 120 and 160 beats per minute (1,2).

Ultrasonic tests on heart are one of the most important tools in the diagnosis of pediatric heart diseases and determining the malfunction of the fetal heart. The primary objective of the study is separating fetus with congenital heart disease or detecting flaws in the appearance of the fetal heart using echocardiographic ultrasound waves (1-3).

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2. Methods

In a cross-sectional study, the fetal echocardiography was performed by a pediatric cardiac cardiologist for pregnant women with fetal cardiac arrhythmia referred to the pediatric cardiac clinic in Sari (north of Iran) at 2013. Results of echocardiography, mother's age, number of pregnancy, family history of heart disease were recorded and statistically analyzed.

2.1 Data analysis

Quantitative data were analyzed by using ANOVA and paired t-test and qualitative data were analyzed by using Chi-Square test and SPSS 18. In all of them, the statistical significance level was considered < 0.05 .

3. Results

The number of pregnant women in the study were 60. 6 of whom were less than 21 years, 51 subjects between 21 and 35 years and 3 patients were over 35 years old. Gestational age of 6 of them was less than 22 weeks, 45 subjects between 22 weeks to 32 weeks and 9 over 32 weeks. 8 patients had a history of heart disease.

Arrhythmias include: premature atrial contractions (PAC) in 45 patients, supraventricular tachycardia (SVT) in 7 patients, bradycardia in 5 patients and flutter in 3 patients.

Echocardiography was abnormal in 6 patients including hydrops in 4 patients and Transposition of the great arteries (TGA) in 2 patients.

No significant difference was observed between mothers' age, gestational age and family history of heart disease in those who had normal Echography and patients who had abnormal Echography ($P > 0.05$). Number of pregnancy has a significant but weak relation with abnormal echography ($r: 0.347, P = 0.004$). Also, a significant weak relation was observed between arrhythmia and results of echocardiography ($r: 0.325, P < 0.0003$) (table 1).

Table 1. The relationship between Echocardiography findings and patient data

Patient data	Echocardiography		P value
	Normal	Abnormal	
Age	< 21 years	5	0.08
	21-35 years	47	
	> 35 years	2	
Gestational age	< 23 weeks	6	0.86
	23-32 weeks	40	
	> 32 weeks	8	
Parity	one	31	0.001
	Two	22	
	Three	1	
Family history of cardiac disease	Positive	6	0.12
	Negative	48	
Arrhythmia	Flutter	3	0.001
	SVT	3	
	PAC	46	
	Bradycardia	2	

4. Discussion

Congenital heart disease is a major cause of mortality in infants and children. Its premature diagnosis avoids death in infants and the ideal treatment. 85% of congenital heart disease include ventricular septal defect, atrial septal defect, aortic stenosis, pulmonary artery stenosis, coarctation of the aorta and 15% include uncommon forms of congenital heart disease. 50% of congenital heart diseases are diagnosed in the first week of life and 60% of cases in the first month (1,3).

The results showed that more pregnancy is more associated with abnormal echography results. Also, a significant correlation was found between arrhythmias and the results of echocardiography.

In the project of examining the prevalence of congenital heart disease in infants and its types in Khorramabad, Iran, about 177 out of 43195 infants had congenital heart disease and the prevalence of congenital heart disease was 4.2 per

1,000 live births in the study. In their study, ventricular septal defect (44%) and atrial septal defect (21%) were the most common congenital cardiac abnormalities. History of congenital heart disease in parents was reported 10.3%. In this study, ventricular septal defect and atrial septal defect were the most common congenital heart abnormalities and the frequency of boys was two times more than girls (4).

In a study by Hayedeh Hashemi Zadeh et al., (2012), the frequency of congenital heart disease in imperforated anus infants admitted to Dr. Sheikh pediatric hospital in Mashhad was examined. The results showed that 29 infants (30%) were diagnosed with congenital heart disease. The most common congenital heart disease was related to atrial septal defect (45%), ventricular septal defect (27.5%), ventricular septal defect plus patent ductus arteriosus (10.3%), ventricular septal defect along with atrial septal defect (7%), atrial septal defect plus patent ductus arteriosus (3.4%), atrial septal defect along with ventricular septal defect as well as patent ductus arteriosus (3.4%) and Tetralogy of Fallot (3.4%). The most common congenital heart disorder was atrial septal defect in imperforated anus infants (5).

Conclusion

The results of our study showed that echocardiography was abnormal in 6 patients, which included hydrops in 4 patients and TGA in 2 patients.

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