

Fetal Outcome In Pregnant Females Presenting In Preterm Labour With Mitral Stenosis

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Abstract

Objective: To determine the fetal outcome after delivery in pregnant females presenting in preterm labour with mitral stenosis during pregnancy.

Methods: We conducted descriptive study in Unit II, Department of Obstetrics & Gynecology, Services Hospital, Lahore from 23-12-2017-to-22-12-2018. Total 136 females who fulfilled the inclusion criteria were enrolled in the study. After detailed information and consent, demographic profile and gestational age were noted then preterm birth (<37weeks) was labeled. After delivery, fetal outcome was scrutinized by weight (<2.5 kg) at the time of birth and APGAR score (<7).

Results: Mean age of women in this study was 28.64±6.32years. Mean gestational age was 35.26±2.37weeks. Among women 48(35.3%) were primigravida, 58 (42.6%) women were para 1 and 30 (22.1%) women were para 2 or above. Preterm delivery was seen in 47(34.6%) women. Poor Apgar score was seen in 41(30.1%) cases and 51(37.5%) mothers had Low birth weight neonates.

Conclusion: Low birth weight was the most frequently observed outcome in women who presented with Mitral stenosis followed by preterm delivery and Poor APGAR score.

Key Words: Pregnancy, Mitral stenosis, Valvular heart disease, Low birth weight, APGAR score, Preterm delivery.

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Introduction

Pregnancy complicated with cardiac disease is classified as High Risk Pregnancy. Increased cardiac demand is a physiological change in pregnancy which is considered to increase the morbidity and mortality in females who are already having a cardiac disease.¹

Cardiac diseases complicate from 0.1% - 4% of pregnancies. In Low and middle income like Pakistan, rheumatic heart disease is most common cardiac ailment with mitral stenosis being most common Valvular

lesion.² Physiological changes of pregnancy mimic the symptoms of complications of cardiac disease and so pose a diagnostic difficulty to obstetricians.^{3,4} The physiological changes in cardiovascular system in pregnancy continue to happen throughout pregnancy but these are more in first trimester. Symptoms of mitral valve disease manifest usually when mitral valve area is decreased to 2cm², which is normally about 4-6cm². Echocardiography is the key investigation in diagnosing the condition.⁵ Cardiac disease in the pregnant female can pose challenges in cardiovascular and fetomaternal management. It is important to know that even in normal females, pregnancy imposes some aggressive physiologic changes upon the cardiovascular system.⁶ Less insight into pathophysiology and simultaneous pregnancy complications make the outcome of pregnancy even poor. Incidence of fetomaternal morbidity and mortality can be downed with proper antenatal, intrapartum and postnatal care in association with cardiologist and pediatrician.⁷

Preconception counseling, risk assessment and opti-

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zation of cardiac disease before pregnancy are the key factor in reducing the incidence of fetomaternal complications in females suffering from valvular heart lesions.^{2,8} According to some literature, patients whose valvular lesion is uncorrected or severe (NYHA III and IV) before pregnancy, and patients who are on anticoagulant therapy must not get pregnant. Recognition of adverse complications of pregnancy, in terms of heart disease and neonate, are of vital importance. It is also stressed to identify antecedent risk factors having the potential of prognosticating the probability of poor perinatal outcome.⁹ By doing this research we will address fetal outcome in women whose pregnancy is complicated with mitral stenosis (NYHAI, II and III) and strategize the best management for these patients.

Methods

The study was run in Unit II, Gynaecology & Obstetrics Department, Services Hospital of Lahore. This was a descriptive case series for one-year duration from 23-12-2017 to 22-12-2018. Ethical approval was taken from IRB of hospital. After informed consent total 136 females accomplishing the inclusion criteria were included in the study. Non probability, consecutive sampling technique was used. Sample size of 136 cases is calculated with confidence level of 95%, margin of error of 5% and expected percentage of low APGAR score taking as 14.9% in pregnant females presenting with mitral stenosis. Patients of age 18-40 years, having singleton pregnancy (on USG) after 32 weeks of gestation calculated from last menstrual periods who presented in active labour (>3 contractions in 10 minutes, >4cm cervical dilatation) with diagnosis of mitral valve Stenosis were enrolled in study. Un-booked females having pregnancy with medical disorders, mitral stenosis comorbid with other cardiovascular or Valvular disease, cardiomyopathy and fetus with congenital anomalies were excluded from study. Demographic profile like age, gestational age and parity were noted. The gestational age was determined and preterm birth (<37 weeks) was labeled. After delivery, APGAR score was noted and birth weight of neonate was obtained. Assessment of fetal outcome was done in terms of poor APGAR score and low birth weight. Data was recorded using pre designed Performa. SPSS version 20 was used to analyze all the data. Mean and standard deviation was calculated for the quantitative variables like age, BMI and gestational age. Frequency

and percentage was calculated for the qualitative variables like outcome i.e. preterm birth, LBW, and poor APGAR score. Parity was also presented as frequency. Data was stratified for age, parity and gestational age. Chi-square test was used to compare outcome in stratified groups. P-value<0.05 was considered as significant.

Result

In study mean age of woman was 28.64±6.32 years. Mean gestational age of women was 37.86±2.37 weeks. Among women 48(35.3%) were primigravida, 58 (42.6%) women's parity was 1 and 30(22.1%) women's parity was >2. Preterm delivery was seen in 47(34.6%) women. Poor Apgar score was seen in 41(30.1%) cases. LBW of neonates was observed in 51(37.5%) cases. Age & parity of patients had no significant effect on preterm delivery (p>0.05, except Gestational age (p<0.05). Age & parity of patients had no significant effect on Poor APGAR score (p>0.05, except Gestational age (p<0.05). Age & parity of patients had not significant effect on LBW (p>0.05, except Gestational age (p<0.05).

Demographics

Table 1: Frequency of Preterm Delivery, Poor Apgar Score & Low Birth Weight

Indicators	N=136	Frequency	Percentage (100%)
Preterm delivery			
Yes		47	34.6%
No		89	65.4%
Poor Apgar score			
Yes		41	30.1%
No		95	69.9%
Low birth weight			
Yes		51	37.5%
No		85	62.5%

Table 2: LBW Stratified for Effect Modifiers

		LBW		p-value
		Yes	No	
Age	18-25	20(41.7%)	28(58.3%)	0.669
	26-32	14(32.6%)	29(67.4%)	
	>32	17(37.8%)	28(62.2%)	
Parity	Primigravida	17(35.4%)	31(64.6%)	0.711
	Parity 1-2	24(41.4%)	34(58.6%)	
	Parity >2	10(33.3%)	20(66.7%)	
Gestational Age	≤37	25(53.2%)	22(46.8%)	0.006
	38-41	26(29.2%)	63(70.8%)	

Discussion

Women in reproductive age with heart disease pose a serious challenge to the medical professional. The

Table 3: Preterm Delivery and Poor APGAR score Stratified for Effect Modifiers

		Preterm delivery		p-value	Poor APGAR score		p-value
		Yes	No		Yes	No	
Age	18-25	13(27.1%)	35(72.9%)	0.201	15(31.3%)	33(68.8%)	0.554
	26-32	14(32.6%)	29(67.4%)		15(34.9%)	28(65.1%)	
	>32	20(44.4%)	25(55.6%)		11(24.4%)	34(75.6%)	
Parity	Primigravida	15(31.3%)	33(68.8%)	0.762	15(31.3%)	33(68.8%)	0.366
	Parity 1-2	22(37.9%)	36(62.1%)		20(34.5%)	38(65.5%)	
	Parity >2	10(33.3%)	20(66.7%)		6(20.0%)	24(80.0%)	
Gesta-tional Age	≤37	47(100%)	0(0.0%)	0.000	26(55.3%)	21(44.7%)	0.000
	38-41	0(0.0%)	89(100%)		15(16.9%)	74(83.1%)	

pregnancy or physiological variations predisposes cardiac patient to deteriorate. Treating pregnant females with valvular lesion of heart is a hard work for obstetricians. Although the risk factors in patients with cardiac disease have been recognized, but there is no good evidence as large scale studies, specially randomized controlled trials are lacking.¹⁰

During pregnancy, the cardiovascular system undergoes exuberant changes in terms of hemodynamics. Healthy females tolerate these cardiovascular changes very well, but significant morbidity and mortality is reported in pregnant females who have cardiac disease.¹¹ Pre-eclampsia, anemia, pre-term labour, and intra uterine growth retardation are frequently reported in pregnant females with cardiac disease, that even worsen the outcome and complicate the management. In order to improve the fetomaternal outcome in pregnancy by providing up to the mark antenatal care, an extensive assessment of pregnant females should be done for some veiled cardiovascular disease.⁷

In this study 34.6% mothers had preterm delivery. Studies from India have reported preterm delivery among women with cardiac disease as 10-27.7%.^{7,8} However local studies from Pakistan reported preterm delivery among women with cardiac disease as 14-21.8% respectively.^{2,12} Results of this study regarding preterm delivery is comparable with the studies from India and Pakistan.

Poor APGAR score was seen in 41(30.1%) neonates in our study. A local study reported frequency of poor APGAR score as 14.9% and an Indian study reported the Poor APGAR score as 10% in women who presented with cardiac disease.^{2,7} In study conducted by Salam S reported Poor APGAR score in 75% of women with heart disease.¹³

Reasons of high frequency of Poor APGAR score was due to lack of proper preconception care with poor follow up with cardiologist and starting pregnancy with already decompensated status, predisposes our patient towards adverse fetal outcome. In order to improve fetal outcome in cardiac patients, they must be treated with a multidisciplinary approach. Pre conception risk assessment, optimization of the disease for pregnancy and counseling of couple regarding anticipated risks should be done in order to improve fetomaternal outcomes.

In this study 51(37.5%) mothers had LBW neonates. In study conducted by Nazia incidence of low birth weight neonates was 27.7% who were born to mothers with mitral stenosis.² Naila Yasmeen in her study reported frequency of LBW as 40% which is a bit higher as that of this study.¹⁰

Extent of maternal wellbeing and duration of pregnancy are main predictor of fetal outcome. In pregnant females with NYHA grade I & II disease, perinatal outcome was good, while in females with NYHA grade III & IV disease, poor perinatal outcome was reported with death rate of 12% - 31%.¹⁴

In pregnant females with cardiac disease, increase incidence of preterm deliveries, low birth weight and poor APGAR score was found specially in females who had moderate and severe Mitral valve stenosis. Valvular stenosis leading to hemodynamic compromise which decreases utero-placental circulation and is a logical explanation of poor fetal outcome. The incidence of preterm delivery, low birth weight and intrauterine growth retardation was less in females with valvular cardiac disease but were maintaining good cardiovascular parameters. Maternal morbidity and mortality were also reduced.¹⁵

Conclusion

This study concluded that among pregnant females with mitral stenosis, the most common outcome was low birth weight, followed by preterm delivery and poor Apgar score. Proper pre-conception assessment of woman regarding cardiac disease and proper antenatal care are key measures to achieve desired pregnancy outcome in these pregnant females. From this study we reached a conclusion that pre-conception diagnosis and optimization, counseling, referral to specialized centre, tailored antenatal care and intrapartum care at multidisciplinary center can improve the fetomaternal outcome in pregnancy complicated with heart disease.

Conflict of Interest: *None*

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Authors Contribution

H.N, R.S: Conceptualization of Project

H.N, M.K, S.K: Data Collection

H.N, M.R: Literature Search

H.N, M.R, M.U: Statistical Analysis

H.N, M.R: Drafting, Revision, Writing of Manuscript