

Original Research

Evaluation Of Feto-Maternal Outcome In Pregnant Women With Rheumatic Mitral Valve Disease

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ABSTRACT

Introduction- Rheumatic heart conditions are the primary indirect cause of maternal fatalities and complicate more than 1% of pregnancies. The aim of present study was to evaluate the feto-maternal outcome in pregnant women with rheumatic mitral valve disease.

Material and methods- The descriptive study was conducted at department of obstetrics and gynecology during the study period of two years among 150 admitted patients. Maternal and foetal outcomes were observed and noted. Results were analyzed using SPSS version 25.0

Results- The mean age of patients was 25.4 ± 4.2 years. The mean gestational age at birth was 36.5 ± 2.5 weeks. Prematurity (<37 weeks of gestation) was seen in 30 cases (20%). Vaginal delivery was the predominant mode of delivery observed in 98 (65.3%) women. The mean birth weight of neonates was 2.7 ± 0.58 kg. The mean APGAR score was 6.95 ± 0.8 . Intrauterine demise transpired in 12 (8%) of instances. The maternal mortality rate was 3.3%. Mild grading was seen in 90 (60%) of patients, moderate level was seen in 40 (26.7) patients and severity of disease was seen in 20 (13.3%). Proportion of low APGAR score, low birth weight and pre-maturity were high in mild mitral stenosis. Women with mild Mitral stenosis had premature babies in 22 (73.3%) cases, APGAR score <7 in 7 (23.3%) cases and 20 (66.7%) neonates had low birth weight. Frequency of intra uterine death (IUD) 7 (58.3%) was high in severe mitral stenosis.

Conclusion –Cardiovascular conditions during pregnancy are linked to considerable morbidity and necessitate meticulous management in a tertiary care facility to achieve optimal maternal and foetal outcomes.

Keywords- fetal, maternal, mitral, outcome, pregnancy, rheumatic

INTRODUCTION

Rheumatic heart disease is a significant issue, causing up to 1.4 million fatalities annually, and is a predominant illness among the youth, particularly in developing nations. In more advanced economies, the diagnosis of rheumatic heart disease is uncommon and usually observed in recent immigrants. [1-3] It presents a specific challenge in pregnant women, when the diagnosis is frequently postponed or overlooked. In developing nations, rheumatic valve disease is the predominant heart condition in pregnant women and the leading cause of maternal mortality. [4-7] Mitral valve stenosis is a condition of significant risk. [8]

Significant alterations transpire in cardiovascular haemodynamics throughout pregnancy. Although these modifications are generally well tolerated by healthy women, individuals with cardiac disease may experience decompensation, leading to considerable morbidity and mortality. [8] Cardiovascular alterations during pregnancy lead to a state of elevated flow and reduced resistance, commencing at 7 weeks of gestation and continuing for 2 weeks postpartum. [9] Valvular heart disease is frequently identified for the first time during pregnancy, as the circulatory changes associated with pregnancy elevate the heart's demands and intensify symptoms such as dyspnoea, palpitations, syncope, fatigue, and haemoptysis. Examination may disclose cyanosis, clubbing, elevated JVP, cardiomegaly, murmurs, arrhythmias, and basal crackles. The functional capability of the heart is evaluated using studies such as echocardiography, oxygen saturation, and comprehensive blood analysis. [10] Notwithstanding ongoing advancements in diagnostic cardiology methodologies, echocardiography continues to be the fundamental tool for evaluating the reversible physiological cardiac remodelling associated with pregnancy-related alterations in valve patency or transvalvular flow patterns. [11] Despite the absence of prior clinical symptoms, patients with acquired rheumatic heart disease, primarily characterised by mitral and aortic valve stenosis, face a significant risk of developing pulmonary oedema, whereas patients with asymptomatic valvular insufficiency generally manage volumetric overload during pregnancy more effectively. [12]

These patients require management through a multidisciplinary approach, involving collaboration between an obstetrician and a cardiologist. Moreover, this management must initiate prior to conception; the family should get advise regarding potential dangers, and optimal conditions for conception must be upheld.[13] Pregnancy should be contraindicated in patients with uncorrected severe valvular lesions or those necessitating anticoagulation. This results from heightened maternal and foetal morbidity and mortality. Medical therapy and balloon valvuloplasty have significantly enhanced outcomes, making term gestation feasible.[11] Recognising pregnancy-related cardiac and neonatal problems is essential. Identifying earlier risk factors that can predict the likelihood of bad pregnancy outcomes is equally crucial.[14]

The present study was conducted to evaluation the feto-maternal outcome in pregnant women with rheumatic mitral valve disease.

MATERIAL AND METHODS

The descriptive study was conducted at department of obstetrics and gynecology during the study period of two years. Ethical permission was taken from institutional ethics committee before commencement of study. Patients were asked to sign an informed consent form after explaining them the complete procedure.

Through consecutive sampling 150 patients who were admitted to department were selected on the basis of following inclusion and exclusion criteria.

Inclusion criteria-All women with rheumatic mitral valve disease (mild, moderate and severe) diagnosed on echocardiography after first trimester (after 12 weeks of gestation calculated by ultrasonography).

Exclusion criteria- All women taking any prior treatment/medicine for disease, women with other medical disorders, e.g. anemia, congenital heart diseases, cardiomyopathy hypertension, asthma, diabetes mellitus, renal disease, thyroid disease, Smokers.

History was obtained concerning age, parity, and symptoms such as dyspnoea, generalised weakness, and palpitations. Gestational age was determined via ultrasonography. All patients were counselled. Echocardiography for the diagnosis and assessment of the severity of mitral stenosis. Evaluation of the patient for newly diagnosed heart failure and ejection fraction was documented. The method of delivery was noted. Maternal mortality was recorded. The foetal outcome was evaluated based on a low APGAR score at five minutes, low birth weight, preterm (gestational age < 37 weeks), and intrauterine mortality. This information was recorded in the proforma.

Data analysis was conducted using SPSS version 25.0. Mean \pm SD was computed for age, parity, gestational age, low APGAR score (<7 at five minutes), low birth weight (<2.5 kg), and ejection fraction. Frequencies and percentages were computed for patients with mild, moderate, and severe mitral stenosis, those who developed heart failure, patients who expired, modes of delivery, and foetal outcomes such as intrauterine mortality, low birth weight, and prematurity. Stratification was conducted based on age, parity, booking status, and degree of mitral stenosis to assess their impact on outcomes.

RESULTS

The study recruited 150 pregnant women with mitral stenosis (mitral valve area ≤ 2.5 cm²) at. The mean age of patients was 25.4 ± 4.2 years. The majority of women, 90 (60%), were aged between 20 and 29 years. Out of 108 women, 85 were multiparous, whereas 23 were primigravida. 68 ladies (45%) were booked, while 82 (55%) were unbooked. The mean gestational age at birth was 36.5 ± 2.5 weeks. Prematurity (<37 weeks of gestation) was seen in 30 cases (20%) as shown in table 1.

Table: 1 Demographic data of patients

Variable	N (%)
Age (in years)	20-29
	90 (60)
	>29
	60 (40)
Parity	PG
	23 (15)
	1
	52 (35)
	>2
	75 (50)
Booking status	Unbooked
	82 (55)
	Booked
	68 (45)
Gestational age	<37
	30 (20)
	>37
	120 (80)

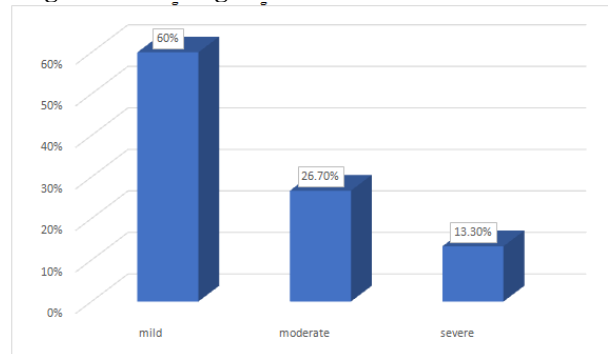
Vaginal delivery was the predominant mode of delivery observed in 98 (65.3%) women, followed by lower segment caesarean section (LSCS) in 52 (34.7%) women. The mean birth weight of neonates was 2.7 ± 0.58 kg. Low birth weight (<2.5 kg) was seen in 30 (20%) newborns. The mean APGAR score was 6.95 ± 0.8 . 15 (10%) exhibited an APGAR score below 7. Intrauterine demise transpired in 12 (8%) of instances. The maternal mortality rate was 3.3% as shown in table 2.

Table: 2 Maternal and fetal outcomes

Variable		N (%)
Mode of delivery	Vaginal	98 (65.3)
	LSCS	52 (34.7)
Birth weight	Low (<2.5 kg)	30 (20)
	Normal	120 (80)
APGAR score	≥7	135 (90)
	<7	15 (10)
Neonatal outcome	IUD	12 (8)
	LIVE	133 (88.6)
Maternal mortality		5 (3.3)

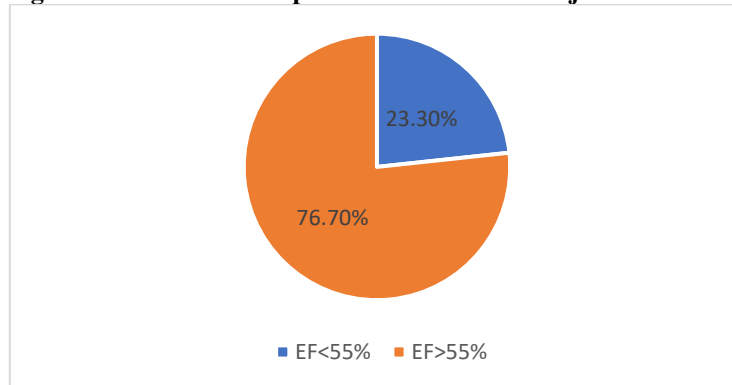
Mild grading (MVA- 1.6–2.0 cm²) was seen in 90 (60%) of patients, moderate level (MVA- 1–1.5 cm²) was seen in 40 (26.7) patients and severity (MVA- < 1 cm²) of disease was seen in 20 (13.3%) patients as shown in figure 1.

Figure: 1 Grading of rheumatic mitral valve disease



Low ejection fraction (less than 55%) was diagnosed in 35 (23.3%) women while greater than 55% was seen in 115 (76.6%) as shown in figure 2.

Figure: 2 Distribution of patients on the basis of ejection fraction

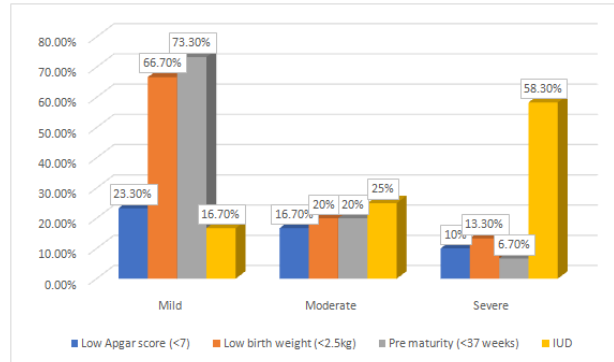


Proportion of low APGAR score, low birth weight and pre-maturity were high in mild mitral stenosis. Women with mild Mitral stenosis had premature babies in 22 (73.3%) cases, APGAR score <7 in 7 (23.3%) cases and 20 (66.7%) neonates had low birth weight. Frequency of intra uterine death (IUD) 7 (58.3%) was high in severe mitral stenosis as shown in table 3, figure 3.

Table: 3 Fetal outcome with respect to grading of disease

Grading of disease	Low Apgar score (<7)	Low birth weight (<2.5kg)	Pre maturity (<37 weeks)	IUD	P value
Mild	7 (23.3)	20 (66.7)	22 (73.3)	2 (16.7)	0.001
Moderate	5 (16.6)	6 (20)	6 (20)	3 (25)	
Severe	3 (10)	4 (13.3)	2 (6.7)	7 (58.3)	

Graph: 3 Fetal outcome with respect to grading of disease



Management of patients was done by using medications like beta blockers, ACE inhibitors and diuretics in 124 (82.6%) of patients, balloon mitral commissurotomy was done in 15 (10%) of patients and surgical valve replacement was done in 6 (4%) of patients. 5 (3.3%) patients does not survived with disease as shown in table 4.

Table: 4 Management of pregnant patients with Mitral valve

Grade		Mild (n=90)	Moderate (n=40)	Severe (n=20)	Total
Medications		85 (94.4)	31 (77.5)	8 (40)	124 (82.6)
Surgery	Balloon mitral commissurotomy	4 (4.4)	5 (12.5)	6 (20)	15 (10)
	Surgical valve replacement	1 (1.1)	2 (5)	3 (15)	6 (4)
Death		0	2 (5)	3 (15)	5 (3.3)

DISCUSSION

The management of pregnancy in individuals with valvular heart disease (VHD) remains a difficulty for clinicians. While the risks in these individuals have been acknowledged, they remain inadequately delineated, as the existing material primarily derives from anecdotal evidence or limited patient cohorts lacking a suitable control group. [15]

Cardiovascular disorders are the predominant non-obstetric contributors to maternal mortality during pregnancy, representing about 10% of maternal fatalities. They complicate 1-3% of all pregnancies, resulting in congenital abnormalities in 70-80% of instances. [16]

Mitral stenosis is predominantly a consequence of acute rheumatic fever. [17] Foetal mortality is not significantly elevated in patients classified as New York Heart Association (NYHA) class I and II; nonetheless, the presence of pulmonary hypertension markedly increases the risks of abortion, intrauterine growth restriction, preterm birth, and early neonatal mortality. [9]

The present descriptive study was conducted for a period of two years at department of obstetrics and gynaecology among 150 patients admitted with women with rheumatic mitral valve disease diagnosed on echocardiography after first trimester.

The mean age of patients was 25.4 ± 4.2 years. The mean gestational age at birth was 36.5 ± 2.5 weeks. Prematurity (<37 weeks of gestation) was seen in 30 cases (20%). Mild grading was seen in 90 (60%) of patients, moderate level was seen in 40 (26.7) patients and severity of disease was seen in 20 (13.3%) patients. Vaginal delivery was the primary route of delivery in 98 (65.3%) women, while lower segment caesarian section (LSCS) was performed in 52 (34.7%) women. The average birth weight of newborns was 2.7 ± 0.58 kg. Low birth weight (<2.5 kg) was observed in 30 (20%) of the infants. The average APGAR score was 6.95 ± 0.8 . Fifteen individuals (10%) displayed an APGAR score below 7. Intrauterine demise occurred in 12 (8%) of cases. The maternal mortality rate was 3.3 percent. A study conducted by Hameed et al revealed that the route of delivery was vaginal in 61 (92%) of 66 individuals with valvular heart disease, whereas the remaining underwent caesarean section due to obstetric indications and cardiac abnormalities. [18] A study conducted by Bonow et al revealed that the route of delivery was vaginal in 196 (78.1%) of 251 cases, whereas caesarean sections were performed on 55 (21.9%) patients. [19] A study conducted by Asghar F et al revealed that 14% of women with cardiac conditions experienced preterm deliveries, while 42.5% had infants with low birth weight. Intrauterine demise transpired in 8.9% of instances. [16]

The maternal mortality rate found in our study was 3.3%. In a study done by Rzek M et al maternal mortality rate was higher than our study i.e. 5.8%. [20] Study done by Wasim T e al found maternal mortality as 3.8% which was consistent to our study. [21]

Mild mitral stenosis was associated with a higher proportion of low birth weight, preterm birth, and low APGAR scores. Twenty (66.7%) neonates had low birth weight, 22 (73.3%) women with mild mitral stenosis had premature newborns, and 7 (23.3%) had APGAR scores less than 7. Severe mitral stenosis was associated with a significant frequency of intrauterine death (IUD) 7 (58.3%). The significant incidence of decreased intrauterine foetal growth seen in this study is likely due to hemodynamic compromise brought on by valvular stenosis and the accompanying reduction in uterine blood flow. For cardiac patients to properly manage their intended pregnancies, prenatal diagnostics, counselling, and contraception are crucial.[22]

In our study most of the patients were managed through medications while surgery was performed in 21 (14%) of patients. In the case-control study by Hameed *et al.*, 50% of patients with mitral stenosis required cardiac medications during their pregnancy. These included beta-blockers, calcium channel blockers, digoxin, heparin, hydralazine and aspirin.[18] In a study conducted by Van Hagen IM et al episodes of heart failure in the presence of MS were treated mainly with diuretics (59.5%), β -blockers (41.2%), or ACE-inhibitors (4.7%). A cardiac intervention was performed during pregnancy in 15 patients with MS (5.9%): 14 patients had percutaneous balloon mitral commissurotomy, and 1 patient had a surgical valve replacement.[23]

Appropriate prenatal assessment and intervention, as recommended by the guidelines, could have decreased mortality and cardiac worsening in this sample. The primary cause of maternal cardiovascular death in developing nations is frequently a delay in patients seeking assistance, which may also be a role in the high maternal and foetal mortality. Therefore, it is crucial to provide adolescents and young women with rheumatic heart disease with appropriate counselling regarding the dangers of pregnancy in order to persuade them to consult a cardiologist prior to becoming pregnant. [24,25]

CONCLUSION

Cardiovascular conditions during pregnancy are linked to considerable morbidity and necessitate meticulous management in a tertiary care facility to achieve optimal maternal and foetal outcomes.

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