

Perinatal Outcome in Pregnant Patients with Moderately Severe Mitral Stenosis

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ABSTRACT

Objective To determine the frequencies of prematurity, low birth weight babies and perinatal deaths in pregnant women presenting with moderately severe mitral stenosis.

Study design Descriptive case series.

Place & Duration of study Department of Obstetrics and Gynecology, Jinnah Postgraduate Medical Centre Karachi, from October 2008 till April 2009.

Methodology Pregnant women with moderately severe mitral stenosis (mitral valve area $<2\text{cm}^2$) fulfilling inclusion criteria, selected through antenatal clinic were included in the study. Perinatal outcome in terms of prematurity, low birth weight, and perinatal mortality were assessed.

Results There were a total of 54 pregnant women with moderately severe mitral stenosis managed during the study period. Preterm babies numbered 22 (40.7%), low birth weight babies ($<2.5\text{kgs}$) were found in 17 (31.5%) cases and perinatal mortality seen in 7 (13%) cases.

Conclusion Encouraging perinatal outcome was observed in this study which was targeting very high risk cardiac patients.

Key words Mitral stenosis, Pregnancy, Perinatal mortality.

INTRODUCTION:

The reported incidence of heart disease in pregnancy is 0.3 to 3.5% and is responsible for 10-25% of maternal deaths.^{1,2} In developing countries like Pakistan rheumatic heart disease still accounts for the majority of cases of mitral valve disease (i.e. $>94.5\%$) and mitral stenosis is the most frequently observed lesion (55%).^{3,4} In developed countries successful pediatric surgery of congenital heart disease and low incidence of rheumatic heart disease, has resulted in increased number of patients with congenital heart disease reaching reproductive age group.^{5,6}

Normal mitral valve orifice area is 5cm^2 . Mitral stenosis is classified to be moderate and severe

when mitral valve orifice area is 2cm^2 and 1cm^2 respectively.² Stenotic rheumatic valves have stiff and restricted leaflets, commissural fusion, annular calcification and chordal fusion.^{7,8,9} There is fixed cardiac output with limited ability to adapt to the increased demands placed on the heart during pregnancy by raised intravascular volume and heart rate.¹⁰ Physiological changes in pregnancy should be understood as they may precipitate decompensation in patients with previously well-tolerated cardiac lesions.¹¹⁻¹³

Successful management of the pregnant women with heart disease requires multidisciplinary approach.¹⁴ Pregnancy in women with mitral stenosis is associated with an increase in adverse fetal outcome. The likelihood of an adverse fetal outcome is related to the severity of maternal valvular disease.¹⁵ Fetal complications associated with mitral stenosis are low birth weight, preterm delivery, birth asphyxia and perinatal death.^{1,4,10} Present study aimed to find out the frequency of prematurity, low birth weight and perinatal deaths in pregnant women presenting with

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moderately severe mitral stenosis.

METHODOLOGY:

This study was carried out in the department of obstetrics and gynecology, JPMC Karachi from October 2008 till April 2009. Patients were included in the study after taking informed consent. Inclusion criteria were: isolated moderately severe mitral valve stenosis (mitral valve area < 2cm²), singleton pregnancy at or beyond 24 weeks of gestation, longitudinal lie of the fetus with cephalic presentation. Criteria for exclusion were: pregnant women with multiple valvular heart disease, multiple gestation, anemia, chronic hypertension, pregnancy induced hypertension, chronic or gestational diabetes, acute or chronic obstructive pulmonary diseases, thyroid disorders and fetal abnormalities.

Patients were closely followed throughout the antenatal period with periodic evaluation by the cardiologist. History regarding age, parity, duration of disease, gestational age and details of any medical disorder was taken. General physical and obstetric examination including symphysiofundal height and its correspondence to gestational age, fetal presentation, position, amount of liquor, expected fetal weight and fetal heart auscultation were done. Investigations including complete blood count, ECG, echocardiography, obstetric ultrasound to confirm gestational age, CTG, Doppler studies (where indicated) were carried out.

During labor, selected cases were vigilantly monitored and managed by obstetric staff in collaboration with the cardiologist, anesthetist and pediatrician. Patients were kept propped up with intermittent oxygen inhalation; BP, pulse, temperature and respiratory rate strictly monitored. Intake and output chart maintained. Prophylactic antibiotics including ampicillin 2gm plus gentamicin 80 mg were given intravenously at the onset of labor or within 30 minutes of cesarean section, followed by ampicillin 1gm intravenous six hourly for 72hours. Patients were monitored throughout labor using ECG and oxygen saturation monitors, effective analgesia was given. During labor fetal condition was monitored by intermittent auscultation of fetal heart sound, CTG at intervals and color of liquor after rupture of membranes. If needed augmentation of labor was done by artificial rupture of membranes and/or by concentrated controlled syntocinon infusion. Partogram was maintained for progress of labor.

Neonatal examination was done at the time of delivery; signs of prematurity noted and weight of the baby recorded. Pediatrician reviewed all neonates daily. Babies were followed up until one

week after delivery and perinatal deaths were recorded. All statistical analysis was done using statistical packages for social sciences (SPSS), version 13. Frequency and percentage were computed for categorical variables like age groups, parity status and perinatal outcome. Mean with standard deviation and 95% confidence interval were also computed for quantitative variables like age, parity and gestational age.

RESULTS:

Fifty-four patients were included in the study. Thirty-two (59.3%) patients were between 25 to 35 year of age. The average age of the patients was 26.67±4.53 year. Average parity was 2.0±1.5 children and gestational age 36.39±2.9 weeks (table I). Seventeen (31.5%) patients were nullipara, while in 34(63%) parity ranged from 1 to 5 and only 3(5.6%) patients were grand multipara.

The frequency of prematurity, low birth weight babies and perinatal deaths are presented in table II. Out of 54 babies, 22 (40.74%) were premature (<37weeks), 17(31.48%) had low birth weight and perinatal mortality was seen in 7(13.46%) cases.

Table I: Patients' Profile		
	Mean±SD	95% CI
Age (in year)	26.67± 4.53	25.43 to 27.9
Parity	2± 1.5	1.28 to 3.35
Gestational Age (weeks)	36.39± 2.9	35.6 to 37.2

DISCUSSION:

In pregnancy the most commonly encountered valvular heart lesion is mitral stenosis. In Pakistan rheumatic heart disease still comprises 90% of the cases, and it remains a major cause of morbidity and mortality in children and young adults living in underdeveloped countries.²The incidence of preterm delivery is 28% with moderate and 44% with severe mitral stenosis.¹ Low birth weight babies numbered 42.55% collectively.¹⁶ Perinatal mortality rate of 44.5 per 1000 total births has been reported in cardiac patients.¹⁷

Unequal burden of streptococcal infection is the main cause of differences in the prevalence of rheumatic heart disease between the countries. Poor socioeconomic environment is an important factor in promoting the spread of streptococcal infection which is further exacerbated by inadequate health system, leading to missed diagnosis and a lack of implementation of secondary prevention measures.¹⁸

Table II: Perinatal Outcome		
Perinatal Outcome	No of patients	Percentage
Birth Weight		
Low birth weight (<2.5 kg)	17	31.48%
Normal birth weight (>2.5 kg)	37	68.52%
Gestational Age		
>37 weeks (term)	32	59.26%
<37 weeks (pre-term)	22	40.74%
Perinatal Mortality		
Perinatal deaths	7	13.46%
Alive babies	47	86.54%

Due to persisting high prevalence of rheumatic fever and the short coming of prevention strategies in developing countries, it is expected that chronic rheumatic heart valve diseases, particularly mitral stenosis will remain prevalent in the near future.

Child bearing women with cardiac disease present a unique challenge to the obstetrician and cardiologist involved in their care.¹⁹ Classic symptoms of heart disease mimic common symptoms of late pregnancy i.e. palpitation and shortness of breath on exertion. Detailed assessment of patients throughout pregnancy may lead to initial discovery of heart diseases and markedly improve the adverse perinatal outcome associated with mitral stenosis.⁴ The results obtained in this study showed average age of the patients 26.67 ± 4.53 year, which is similar to the observation in the study by Gul-e-Irum and Mazhar SB (27.5 ± 5.2 year).¹⁷ The mean age of patients was 32 year in a study by Silversides done at Canada.²⁰

The symptoms of mitral stenosis typically do not appear until 15-40 year after an episode of acute rheumatic fever. Because of lack of treatment with antibiotics and recurrent infection with group-A streptococcus, patients may become symptomatic in younger age in middle or far east.³ The average birth weights of the neonates born to mothers with advanced rheumatic heart disease have been shown to be lower than the average in an uncomplicated pregnancy.³ Low birth weight babies were found in 17(31.5%) cases in our study while in the study conducted at Nishtar Hospital Multan low birth weight babies numbered 42.55% and 45% in a study done at Services Institute of Medical Sciences.^{16,4} Number of preterm babies were 22(40.7%) in our study which is considerably higher than in the study conducted by Asghar F, showing 14% figure of preterm babies,

but comparable to the study by Hameed A, demonstrating preterm babies in 28% and 44% with moderate and severe mitral stenosis respectively.^{16,21}

Perinatal mortality occurred in 7(13%) cases in our study, in contrast to 10(7%) perinatal deaths recorded in a study done at Allama Iqbal Medical College Lahore, which might be related to sample size ($n=160$).⁴ Six (4.2%) perinatal mortalities occurred in a study conducted in Turkey.²² The main probable cause of high perinatal mortality in our study was prematurity.

CONCLUSION:

Although in our study patients belonged to the very high risk group the perinatal outcome was convincingly comparable to the studies conducted worldwide.

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