Obstetric outcome in patients with rheumatic heart disease: experience in a tertiary hospital

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ABSTRACT

Aims: To determine the clinical outcome of rheumatic heart disease in pregnancy.

Methods: Retrospective cross-sectional descriptive study from April 2019 to April 2021 in Nobel Medical College, Biratnagar, Nepal. Feto-maternal variables were taken for their health status. Data presented in table with frequency.

Results: Out of 13013 deliveries in a year, 49 had cardiac disease (0.37%) and 38 had rheumatic heart disease (0.29%) over 28 weeks of gestation; 95% (n=36) had mitral valve involvement; 12 were primigravida and 7 preterm at the time of delivery. Half of them underwent caesarean section for various indications. Most common maternal complications were cardiac failure, cardiac arrythmia, admission to ICU, obstetric complications, including maternal mortality in 5.2% (n=2) cases. Low birth was in 29% (n=11) of cases, and 34% (n=13) of them needed NICU care at the time of delivery. There was history of rheumatic fever in 9 cases (24%).

Conclusions: Rheumatic heart disease is the commonest diagnosis among heart disease in pregnancy and adverse event can be minimized by multidisciplinary intervention.

Key words: cardiac disease, maternal mortality, pregnancy, RHD

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INTRODUCTION

Rheumatic Heart disease (RHD) is an acquired heart disease, sequelae of rheumatic fever which affects heart valves and can result in heart failure and if left untreated. It is common in children and teenage group. Pregnancy is not an uncommon phenomenon in those age group. RHD has lots of complications in pregnancy

like heart failure, arrythmia, requirement for Intensive Care Unit (ICU) and even maternal mortality. RHD remains a major health problem in the developing countries. According to World Health Organization (WHO) Rheumatic heart disease claims approximately over 288348 lives each year - the large majority in low- or middle-income countries (LMICs).[1] Heart disease is the highest indirect (non-obstetric) cause of mortality for pregnant women in both high-income countries (HICs) and LMICs. Rheumatic heart disease (RHD) is the most common acquired heart disease in many countries, more so in developing countries.[2]

Damage to the cardiac valves, which is the hallmark of RHD, often leads to significant valvular heart disease and left ventricular dysfunction. These changes, coupled with the marked physiological adaptations associated with pregnancy, impose an increased hemodynamic stress on the cardiovascular system, increasing the risk of cardiovascular complications and poorer outcomes for both the mother and the fetus. Nevertheless, pregnancy complicated by non-severe valvular heart disease is generally associated with a favorable prognosis, providing that the risks are managed appropriately. This study aims to determine burden of rheumatic heart disease in pregnancy and feto-maternal outcome.

METHODS

This is a retrospective observational descriptive study carried out at Nobel Medical College and Teaching Hospital (NMCTH), Biratnagar, Nepal, from April 2019 to April 2021 to evaluate pregnancy outcome in patients with rheumatic valvular heart disease. After getting approval from the institutional ethical committee from this institute (IRC no 443/2021), all the records of the admitted and delivered in this college were searched for the rheumatic heart disease and pregnancy. Patient information and obstetrics profiles were recorded in pre-formed Performa. Baseline data at the time of admission included maternal age, parity, nature of the underlying cardiac lesion, New York Heart Association (NYHA) functional class, and cardiac assessment including ejection fraction.[3] Recorded data were analysed using statistical tool SPSS version 20.

RESULTS

From 13013 deliveries over 28 weeks of gestation conducted at NMCTH, 49 pregnancies were detected to have cardiac disease during pregnancy and delivery. In this retrospective cross-sectional study, 49 case records of pregnancies with cardiac disease (0.37% for heart disease) were analysed; and among them 38 (77.6%) were RHD (0.29% of delivery). Age ranges from 18 to 40 years (26±5.5) years 27 of them were in 20-30 years age group. [Table-1]

Table-1: Age group of distribution of heart disease in pregnancy (N=38)

Age group (in year)	Frequency (%)
<20	5 (13.2%)
20-25	16 (42.1%)
25-30	11 (28.9%)
30-35	3 (7.9%)
>35	3 (7.9%)

Twelve (32%) were primigravida and 7 (18%) were preterm at delivery; 13 (34%) were diagnosed RHD in the early first visit and 15 (39.5%) at the time of admission. Most of them (63.2%) were in NYHA grade 2. [Table-2]

Table-2: NYHA grade of patients at the time of admission

NYHA	Frequency (%)
I	7 (18.4%)
II	24 (63.2%)
III	6 (15.8%)
IV	1 (2.6%)

Nine cases had history of rheumatic fever and 3 cases had prior cardiac surgeries (2 PTMC and 1 ASD closure). Thirty-six (95%) cases had mitral valve involvement with various types of pathology. Three-fourth cases had mitral stenosis of various degree with or without other valvular lesions. More than half of them (n=15) were severe mitral stenosis. Eight cases (21%) had abnormally low ejection fraction. Mitral valve was involved in 36 (95%) of the cases (36/38). There was history of rheumatic fever in 9 cases only (24%). [Table-3]

Table-3: Cardiac valve involved (N=38)

Valvular lesion		Frequency
MS ± MR/TR/AR/AS (n=28;74%)	MS	19
	MS + TR	5
	MS + MR	2
	MS + AR	1
	MS + AR + TR	1
MR ± AR/AS/TR (n=8;21%)	MR	4
	MR + AR	2
	MR + AS	1
	MR + TR	1
Others (n=2;5%)	AS	1
	TR	1

Note: AS-Aortic stenosis, MR-Mitral Regurgitation, AR-Aortic Regurgitation, MS-Mitral Stenosis, TR-Tricuspid Regurgitation.

Vaginal and caesarean deliveries were equally distributed in RHD. [Table-4]

Table-4: Mode of delivery (N=38)

Mode of delivery	Frequency (%)
Spontaneous Vaginal delivery	17 (45%)
Vacuum delivery	2 (5%)
Caesarean Section	19 (50%)

Vaginal birth after Cesarean section (VBAC) was the most common cause of the CS (42%) and other causes include fetal distress, impending maternal cardiac failure, cephalopelvic disproportion (CPD), failed induction and others. [Table-5]

Table-5: Indication of CS (N=19)

Indication of CS	Frequency
VBAC refusal	8
Foetal distress	4
Impending heart failure	4
CPD	1
Failed induction	1
Others	1

Almost half (47%) of the total needed ICU care, and other maternal complications includes cardiac arrythmia, pre-eclampsia, post-partum haemorrhage, pulmonary edema and even maternal mortality. Maternal mortality occurred in two cases due to pulmonary edema with severe MS. There were 39 maternal complication events altogether in 20 patients. [Table-6]

Table-6: Maternal Complications among RHD (N=38)

Maternal Complications	Frequency (%)
ICU admission	18 (47.4%)
PPH	6 (15.7%)
Pulmonary edema	5 (13.15%)
Cardiac arrythmia	4 (10.5%)
Pre-eclampsia	4 (10.4%)
Mortality	2 (5.2%)

Most of their babies were of average weight and 29% babies were of low birth weight. Thirty four percent of the babies needed NICU care for various reason like low birth weight, meconium stain liquor and respiratory distress syndrome. [Table-7]

Table-7: Fetal outcome in RHD (N=38)

	Fetal Outcome	Frequency (%)
Birth weight	Very low (<1.5 kg)	3 (8%)
	LBW (<2.5 kg	8 (21%)
	Average (2.5-4kg)	26 (68%)
	High (>4kg)	1 (2.6%)
Gender	Male	18 (47%)
	Female	20 (53%)
1-min Apgar	0	2 (5%)
	<7	4 (11%)
	≥7	32 (84%)
Others	NICU admission	13 (34%)
	Prematurity	3 (8%)

DISCUSSION

Heart disease is one of the most common risk factors for the maternal and neonatal morbidity and mortality and continues to be a major health problem.[4-6] It has not so tremendous hazards in developed countries but for much of the developing world, RHD still kills. Estimates range that between 250-330 thousand people a year die from what has been called the "disease of poverty" across East, Central and South Asia, Africa and South pacific.[7] Twenty-five population-based studies from South Asian countries (Bangladesh, India, Nepal and Pakistan) showed a decreasing trend of RHD in Bangladesh, India and Pakistan, whereas an increasing trend of RHD was observed in Nepal.[8]

The incidence of heart disease in our study was 0.3% and that of the RHD was 0.29% (2.92/1000). This result was comparable with other studies and it was lower than some study. [9-11] RHD incidence was higher than previous studies done in Nepal in various places in Kathmandu [12-15] but quite less than a study done by Shrestha NR et al[16] in 2015 in Sunsari which was Echo based screening done in 5–15-year age group and incidence was 10.2/1000. Patients with the cardiac disease are often visit for the first time in the late trimester where they seek medical care for worsening symptoms.

Mitral stenosis (MS) has been found to be the dominant lesion in RHD which is similar to other studies.[4,6,10,17]

Majority of the patients of RHD belonged to NYHA I and II as in other study.[4,9,17] Incidence of preterm labour (18.4% in present study) was also similar to other studies.[9,17] Vaginal delivery was commonest mode of delivery similar to other study.[18-20] LBW was more common (29%) than other study.[4,9]. It may be due to low socioeconomic condition, poor nutrition not proper antenatal check-up. But BLW was lower than some study[18] (37.6%). IUFD was found in 5.3% which was similar to other studies like[4,9,21] but less than some studies.[10] There were 2 cases of maternal mortality which constitute 5.2%, which was similar to

other studies.[9,17,22] Both were the cases of severe MS and died due to pulmonary edema.

Conclusion: Although RHD remains prevalent in eastern Nepal, with multidisciplinary care, the incidence of maternal and fetal mortality is low. Pregnancy increases the morbidity and mortality of both mother and baby in women with RHD and requires additional close monitoring by the obstetricians and the cardiologists.

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