Research Article

Fate of Pregnancy in Women with Rheumatic Heart Disease Attending a Tertiary Referral Centre

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ABSTRACT

Introduction: The overall incidence of heart disease complicating pregnancy is approximately 1%. Despite modern cardiac care, serious maternal cardiac disease complicating pregnancy can have significant adverse effects on maternal and fetal outcomes.

Objective: To study the fate of pregnancies in patients with Rheumatic heart disease attending a tertiary level referral centre.

Materials and Method: A hospital based cross-sectional study was conducted in Tribhuvan University Teaching Hospital and Manmohan Cardiothoracic Vascular and Transplant Centre over a period of 12 months. Patient profile, types of valvular lesion and pregnancy outcomes were studied.

Result: A total of 91 pregnant patients with Rheumatic heart disease who underwent termination of pregnancy at the centres at various gestational ages were studied. The commonest age group was 20 to 24 years 33 (36.3%) and most were primigravida 44 (48.3%). Mitral Stenosis was the commonest valvular lesion 65 (71.4%). Of the 91 patients, 9 (9.8%) had undergone Percutaneous transluminal mitral commisurotomy and 20 (21.9%) had undergone open heart surgery prior to pregnancy. A sum of 60 (65.9%) patients reached period of viability and delivered after 28 week while 5 (5.4%) had termination of pregnancy in second trimester and rest 26 (28.5%) were first trimester losses: elective abortion in 18 (19.7%) cases and spontaneous abortion in 8 (8.7%) cases. Patients who delivered at or beyond 28 weeks had favorable pregnancy outcome (except one still birth and neonatal death each).

Conclusion: Rheumatic heart disease continues to be of significant occurrence in pregnant patients. One third of them reached the period of viability with good pregnancy outcome attributed to combined good obstetric and cardiac care. However, a significant number underwent voluntary termination in first trimester which could have been prevented by effective contraceptive counselling.

Keywords: Fate; pregnancy; rheumatic heart disease.

INTRODUCTION

The overall incidence of heart disease complicating pregnancy is approximately 1%.[1] With the decrease in maternal death as a result of the classic causes of hemorrhage, hypertension and infection; the relative importance of cardiac diseases have increased. Despite modern cardiac care, serious maternal cardiac disease complicating pregnancy can have significant adverse effect on maternal and fetal outcomes.[1-3] Rheumatic heart disease (RHD) is the most common acquired heart disease in many countries, more so in developing countries.[4] Rheumatic heart disease is a complication of rheumatic fever where cardiac valve damage results from an immunologic injury initiated by group A β-hemolytic streptococcal infection.[5]

During pregnancy, the increased maternal blood volume and heart rate can lead to heart failure, pulmonary edema and arrhythmias causing significant maternal morbidity and even mortality. Not surprisingly, poor maternal functional class (New York Heart Association-NYHA class III or IV) is associated with worse maternal and fetal outcomes. Rates of intrauterine growth retardation and prematurity are increased with complicated rheumatic heart disease due to relative inability in maintaining adequate utero-placental circulation.[6]

This study was conducted to see the fate of pregnancies in patients with Rheumatic heart disease attending a tertiary level referral centre.

MATERIALS AND METHOD

A cross-sectional study was conducted in the Department of Obstetrics and Gynecology of Institute of Medicine (IOM), Tribhuvan University Teaching Hospital (TUTH) and Manmohan Cardiothoracic Vascular and Transplant Centre (MCVTC), Maharajgunj, Kathmandu, Nepal. Ethical clearance was obtained from the Institutional Review Board of IOM. All pregnant patients with RHD that were admitted in TUTH and MCVTC between 14th April 2014 to 13th April 2015 were studied. Patients with congenital heart disease were excluded. Data were collected from the record book of labour room, patient files and labour room audits of the Department. For this study, data were collected regarding age, gravidity, parity, heart disease (NYHA class), type of valvular disease, number of valves involved, valvular surgery done and pregnancy outcome. All data were entered into a master chart and descriptive analyses in the form of numbers, percentages and means were calculated using the SPSS 19.0 software.

Definition

NYHA Class: Evaluation of the functional status of the patients was assessed mainly by the universally accepted NYHA functional class.[7] NYHA comprised of four classes and analyzing the cases according to it helps to categorize the patients risk category.

NYHA Class I	No limitations of physical activity; Ordinary physical activity does not cause undue fatigue, palpitation, dyspnoea or angina pain.
NYHA Class II	Slight limitation of physical activity; Ordinary physical activity results in fatigue, palpitation, dyspnoea or angina pain.
NYHA Class III	Marked limitation of physical activity; Less than ordinary physical activity causes fatigue, palpitation, dyspnoea or angina pain.
NYHA Class IV	Inability to perform any physical activity without discomfort, symptoms of cardiac insufficiency or angina syndrome may be present even at rest; Any physical activity increases discomfort.

RESULT

Out of 91 patients, 33 (36.3%) cases belonged to age group of 20 to 24 years with age range of 16 to 35 years. The mean age of the patients was 24.9 years. Most of the patients i.e. 44 (48.3%) were primigravidas (Table 1).

Table 1: Patient profile (N=91).

Characteristics	n (%)
Age (Year)	
< 20	7 (7.7)
20-24	33 (36.3)
25-29	32 (35.2)
30-34	16 (17.5)
≥ 35	3 (3.3)
Gravida	
1	44 (48.3)
2	29 (31.8)
3	9 (9.9)
4	7 (7.8)
5	2 (2.2)

Most of the patients, 77 (84.6%) belonged to NYHA class I whereas the least i.e. 2 (2.1%) patients belonged to class IV. Of the 91 patients, six developed complications out of which three developed heart failure, two had pulmonary edema and one patient had cardiogenic shock (Table 2).

Table 2: Heart disease profile according to NYHA functional class at time of termination of pregnancy and maternal complications.

NYHA class	n (%)	Complications	
		n	
I	77 (84.6)		
II	9 (9.9)	1	Heart failure (1)
III	3 (3.3)	3	Pulmonary edema (1) Heart failure (1) Cardiogenic shock (1)
IV	2 (2.1)	2	Pulmonary edema (1) Heart failure (1)
Total	91	6	

Mitral stenosis was the leading valvular lesion in 65 (71.4%) patients and 51 (56.04%) cases had involvement of two valves (Table 3).

Out of 91 patients, 29 had surgical correction of the valve, of which 25 had surgery prior to pregnancy. PTMC was performed in four patients with severe MS (Mitral Stenosis) during second trimester (Table 4).

Pregnancy termination though unfavorable was done in first or second trimester for various reasons in 31(19.7%) cases while in 60 (65.9%) patients, delivery were conducted at or beyond period of viability of 28 weeks. Of the fortunate 60 who reached at or beyond 28wks, 36 (60%) cases had Lower Segment Cesarean Section (LSCS) and 9 (15%) cases had instrumental delivery (Table 5). Dinoprostol gel induction was needed in one case.

Among the 61 babies, two babies had adverse perinatal outcomes. One baby was stillborn at 30 weeks of gestation whereas rest one born at 29 weeks period of gestation died at three hour of life. A total of 59 (96.72%) patients had live births including one set of twins. Out of them, 9 (14.74%) babies were preterm. There were 17 small for gestational age babies (Table 6).

Table 3: Predominant valvular lesion and number of valves involved (N=91).

Valvular status	n (%)
Predominant valvular lesion	
Mitral Stenosis	65 (71.4)
Mitral Regurgitation	10 (10.9)
Aortic Regurgitation	10 (10.9)
Aortic Stenosis	6 (6.6)
Number of valves involved	
1	27 (29.6)
2	51 (56.04)
3	12 (13.2)
4	1 (1.09)

Table 4: Valvular surgery.

Valvular Surgery	Before Pregnancy	During Pregnancy
PTMC (Percutaneous Transluminal Mitral Commisurotomy)	55	4
MVR (Mitral Valve Replacement)	8*	
AVR (Aortic Valve Replacement)	5*	
DVR (Double Valve Replacement)	7*	
Total	25	4

**Patients on Warfarin*

Table 5: Pregnancy outcome including mode of delivery.

Unfavourable with first and second trimester losses	n (%)	Delivery after 28 weeks			
Elective abortion	18 (19.8%)				
Missed abortion /Blighted	4 (4.4%)	Vaginal (24)			36
Incomplete abortion	4 (4.4%)	Normal Delivery	Instrumental		
Early Intra-uterine fetal death	4 (4.4%)	15	Vacuum	Forceps	
Congenital Fetal Malformations	1 (1.0%)		8	1	
Total	31 (19.7%)		9		
		60 (65.9%)			

Table 6: Fetal outcome and birth weight according to period of gestation.

Period of gestation	n	Live birth 60/61		Still birth 1/61	Birth weight	
		Well Baby	Early neonatal death		Appropriate for gestational age	Small for gestational age
28-32	3	1	**1**	**1**	**1**	**2**
33-36	6	6 (1 set of twins)			4	2
37-40	52	52			39	13
Total	61	59	1	1	44	17

DISCUSSION

Rheumatic heart disease is still a health problem in developing countries despite easy availability of antibiotics. Poverty, overcrowding and unhygienic living conditions intensifies the problem. Normal physiological changes to heart and blood vessels during pregnancy causes increased workload to heart turning pregnancy into stressful condition. This can lead to complications in both mother and baby but with timely interventions, these complications are preventable leading to decreased morbidities and mortalities. TUTH and MCVTC are tertiary care centers in Kathmandu where most pregnant patients with RHD get referred for management from most part of the country.

In the present study, majority of patients i.e. 33 (36.3%) belonged to the age group of 20-24 years similar to an observational study of 281 pregnant women with heart disease by Konar et al wherein the majority of the patients (n=122) were of age group 20–24 years.[8] Most of the women in the present study i.e. 44 (48.3%) were primigravidas consistent with the study done at BPKIHS-Nepal[9]; while contrary to this, in study done at University College Hospital-Nigeria, 13 (29.5%) were of higher parity i.e. gravida 3, which was closely followed by primigravidas 12 (27.3%).[10] The difference could be attributed to the difficulty in convincing the Nigerians to use contraceptive measures.

Among the four valves, mitral valve was the most commonly involved one and MS accounted in 65 (71.4%) patients. Also in the study by Chetri et al, among the 53 patients analyzed over one year in BPKIHS-Nepal, mitral valve was most commonly involved valve and the predominant lesion was MS (62%).[9]

There were 29 patients who had undergone cardiac surgery. Most common surgery done in the present study was PTMC in nine patients of which four cases performed during pregnancy had good results. Similar findings were shown in study conducted at BPKIHS, in which among 47 women with RHD, 14 (31%) cases had undergone mitral balloon valvuloplasty during pregnancy without any complication.[9]

For those pregnancies which ended in first or second trimester, 18 were elective abortions, eight patients had spontaneous abortions and four had Intra-uterine fetal demise (IUFD) while one case was terminated for Dandy Walker malformation following anomaly scan. Among the 18 patients who opted for elective termination of pregnancy in the first trimester, 10 women were on Warfarin and with the threat of Warfarin embryopathy, patients chose not to continue pregnancy. Similar was situation in study by Shrestha et al. where 11 women out of 18

cardiac patients who were on warfarin had medical termination of pregnancy (MTP).[11] The other reasons for MTP were unwanted pregnancy in four and other four had lesions incompatible with pregnancy. Ideally the best mode of delivery for RHD patient is vaginal and cesarean section should be reserved for obstetric indications only. In the present study, most common mode of delivery was caesarean section in 36 (60%) patients. Compared to our study, in study conducted in BPKHIS-Nepal, 33 (55%) cases had vaginal delivery and 20 (44%) cases had cesarean sections.[9] Operative deliveries at BPKIHS-Nepal[9] were slightly less compared to the present study. Similarly an Indian study of 129 RHD patients done in Tamil Nadu by Sethuraman et al. also showed vaginal deliveries in 98 (76.7%) cases.[12] The reason for the present study having greater proportion of operative deliveries compared to that found in other two centers were mostly due to obstetric indications where fetal distress contributed to be the most common indication (n=15, 41.66%). More frequent use of Cardiotochography (CTG) leads to increased intervention and so does intensified use of USG which diagnoses Oligohydrominos resulting in Lower segment caesarean section (LSCS).

Among the 91 women, six patients developed maternal complications in the form of heart failure, pulmonary edema and one case needed inotropic support during the postoperative period following emergency LSCS. Amongst these, four patients were referred cases, and presented late in third trimester only. Fortunately there was no mortality which could be due to early intervention. In a study by Koregol et al in 118 pregnant women with cardiac disease from January 1995 to December 2006 at a tertiary care center in India, cardiac complications were noted in 20 (18.18%) patients, out of which 12 had pulmonary edema. Maternal mortality was noted in 4 (3.6%) patients, three of which were due to pulmonary edema.[13] According to study conducted by Dali et al. at TUTH over 15 years (1998-2013), out of 112 maternal deaths, 14 deaths occurred due to heart disease of which 13 were due to RHD.[14]

There were total 61 births, out of which majority 59 (96.72%) were live birth, 1(1.63%) was stillbirth and 1(1.63%) early neonatal death which occured at three hour of life. The cause of IUFD and stillbirth could be due to the presence of severe preeclampsia more than RHD that lead to absent diastolic flow on umbilical artery. The early neonatal death could be due to the extreme prematurity since the mother presented at 29 weeks of gestation in advanced stage of labour. The normal birth weight of babies could be due to the fact that majority of cases were booked ones with regular ANC visits with optimized cardiac status and were in NYHA class I. In a single center study of 480 women with RHD in Chandigarh, India over a period of 13 years, the mean gestational age at delivery was 37.46 ±2.98 weeks, with a mean birth weight of 2508±583.625 grams. This finding was consistent with the present study.[15]

CONCLUSION

RHD continues to be of significant occurrence in pregnant patients at these centres. One third of them reached the period of viability with good pregnancy outcome which was possible due to good obstetric and cardiac care in combination. However a significant number of cases underwent voluntary termination in first trimester which could have been prevented by effective contraceptive counseling prior hand to these patients.

JNDA

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