CARDIAC DISEASE IN PREGNANT WOMEN- AN EXPERIENCE IN A TERTIARY HOSPITAL IN KERALA

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ABSTRACT**BACKGROUND**

Maternal cardiac disease contributes to a significant proportion of maternal mortality cases and severe maternal morbidity. The proportion of cardiac disease such as Congenital Heart Disease (CHD) and Rheumatic Heart Disease (RHD) varies in different countries. This is a descriptive study in which we retrospectively analysed all women with cardiac disease who delivered in Government Medical College, Kottayam, from 01/01/2011 to 31/12/2013.

Aims and Objectives-

1. To study the proportion of different types of cardiac disease complicating pregnancy in parturients who delivered in Government Medical College and Hospital, Kottayam during the study period of three years.
2. To study the maternal and foetal outcome in parturients with cardiac disease during pregnancy, delivery and first post-partum week.

MATERIALS AND METHODS

It is a descriptive study and the data of women who met the inclusion criteria were collected from the hospital records using a proforma. The type of heart disease, cardiac complication developed during pregnancy, delivery and first post-partum week were recorded and analysed.

RESULTS

Out of 14,413 deliveries during study period, there were 181 women with cardiac disease (1.26%). Out of the cardiac diseases, CHD were 60.22% and RHD were 36.46%; 6.08% cases developed cardiac complications; 71.82% delivered vaginally and 27.62% underwent caesarean delivery; 91.16% fetuses were born term; 8.84% were born preterm; still birth was 1.66%.

CONCLUSION

The proportion of women having cardiac disease were found comparable with that in other studies. RHD topped the list in other studies. But in our study, majority was CHD. There were no maternal deaths due to cardiac disease in the observed study period.

KEY WORDS

Cardiac Disease in Pregnancy, Congenital Heart Disease, Rheumatic Heart Disease.

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BACKGROUND

Pre-existing Cardiac Disease of mother in pregnancy may get worsened during pregnancy or labour and can affect maternal and neonatal outcome adversely. The women with congenital heart disease reaching adult age is increasing due to improvement in surgical management of these cases. The incidence of Rheumatic heart disease in developed countries has decreased very much. In those developed countries congenital heart disease, ischaemic heart disease and the like top the list. In underdeveloped countries Rheumatic heart disease still tops the list of maternal heart disease. The main objective of the present study was to find the proportion of the different cardiac lesions during pregnancy and to assess the effect of cardiac disease on maternal and foetal health.

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MATERIALS AND METHODS

It is a descriptive study conducted at Government Medical College, Kottayam. We conducted a retrospective analysis of cardiac disease complicating pregnancy in women who delivered in Government Medical College, Kottayam, from 01-01-2011 to 31-12-2013. The data of women who met inclusion criteria were collected using a proforma from the hospital records. The type of cardiac disease, period at which the cardiac disease was diagnosed, cardiac complication that developed during pregnancy, labour and first post-partum week were recorded. The details of delivery, baby weight and early neonatal outcome were assessed.

All women with cardiac disease who delivered a foetus weighing ≥ 500 gm during the three years period from 01/01/2011 to 31/12/2013 were included in the study. Women with cardiac disease who underwent Medical Termination of Pregnancy or spontaneous abortion were excluded from the study.

RESULTS

There were 14,413 deliveries during the study period. The total number of cardiac disease complicating pregnancy during this period was 181 (1.26%). Out of these cardiac diseases, 110 cases were CHD (60.22%) and RHD comprising

of 65 cases (36.46%), miscellaneous cases were 6 (3.31%) [Table 1].

Majority of the women belonged to age group 25 - 30 years (44.2%); 50.28% women were nullipara [Table 2]; 48 out of 181 women had their cardiac disease detected in either present or past pregnancy. The commonest comorbidity was gestational hypertension [Table 3].

Out of 181 cardiac cases 130 women had vaginal delivery (71.82%). Caesarean delivery was in 50 women (27.62%). There was a laparotomy for ruptured uterus too; 91.16% of babies were born term and 8.84% preterm. Out of three still births, one was due to ruptured uterus. Two were in women who had Mitral Valve Replacement (MVR) and on anticoagulants. Among these, one woman underwent MVR during present pregnancy. The other woman was a defaulter who was not on follow-up [Table 4].

Atrial Septal Defect (ASD) was the most common congenital heart disease. Complex congenital heart disease was less in number. Maternal and foetal outcome in congenital heart disease group was better. RHD was the second common lesion. Almost all RHD included mitral valve disease [Table 5].

The cardiac complications recorded were cardiac failure, arrhythmia requiring pharmacotherapy, infective endocarditis and cardiac intervention in pregnancy. There were two cases of cardiac intervention [Table 6 and 7]. One was a case of balloon mitral valvotomy (BMV). In the second case closed mitral valvotomy (CMV) was attempted, but MVR had to be done. This patient had a pre-term still birth. There was no maternal death in the study population.

	No.	%
Total deliveries	14413	
Cardiac diseases	181	1.26
Congenital heart disease	110	60.22
Rheumatic heart disease	65	36.46
Miscellaneous	6	3.31

Table 1. Details of Cardiac Cases

Age (Years)	No.	%
< 20	4	2.21
20 - 24	62	34.25
25 - 30	80	44.20
31 - 34	23	12.71
≥ 35	12	6.63
Parity		
Nullipara	91	50.28
Primipara	80	44.20
Multipara	10	

Table 2. Details of Parturients

	No.	%
Gestational hypertension	19	17.27
Anaemia	6	5.45
Diabetes	3	2.73
Thyroid	3	2.73
Hypertension + Diabetes	1	0.9
Hypertension + urinary tract infection	1	0.9
Seizure disorder	1	0.9

Table 3. Details of Comorbidity

	No.	%
Vaginal delivery	130	71.82
Caesarean delivery	50	27.62
Laparotomy	1	0.55
Term	165	91.16
Preterm	16	8.84
AGA	121	66.85
SGA	57	31.49
Stillborn	3	1.66

Table 4. Obstetric and Neonatal Outcome

AGA: Adequate for gestational age; SGA: Small for gestational age

	No.	%	Prior Interventions
Congenital Heart Disease	110		
ASD	47	42.73	26
VSD	8	7.27	3
PFO	3	2.73	
MVP	5	4.55	
MVP + MR	19	17.27	
ASD + MVP + MR	1	0.90	
TR + PAF	1	0.9	
PS	1	.9	
Complete heart block	1	0.9	
PS + Complete heart block	1	0.9	
MR + ASD closure	1	0.9	1
AS	3	2.73	
Bicuspid Aortic Value	2	1.82	
TOF	1	0.90	
Corrected TOF	2	1.82	2
PDA + ASD	1	0.9	
Dextrocardia, situs inversus	1	0.90	
PDA	4	3.64	2
Ebstein's Anomaly	2	1.82	
PDA + AR	2	1.82	
Corrected TGA	1	0.9	1
ASD + VSD	3	2.73	
Rheumatic Heart Disease	65		14
MS	5	7.69	
MS + MR	20	30.77	
MVP	1	1.54	
MVP + MR	6	9.23	
MS + MR + AR	3	4.62	
MS + AR	2	3.08	
MS + AR + ASD	1	1.54	
MS + MR + TR + PAH	1	1.54	
AR	2	3.08	
Miscellaneous	6		
MR	1		
Arrhythmias	3		
Cardiomyopathy	2		

Table 5. Details of Cardiac Lesions

ASD: Atrial Septal Defect, VSD: Ventricular Septal Defect, PFO: Patent Foramen Ovale, MVP: Mitral Valve Prolapse, MR: Mitral Regurgitation, TR: Tricuspid Regurgitation, PAH: Pulmonary Artery Hypertension, PS: Pulmonary Stenosis, AS: Aortic Stenosis, TOF: Tetralogy of Fallot, PDA: Patent Ductus Arteriosus, AR: Aortic Regurgitation, TGA: Transposition of Great Arteries.

NYHA Grade	No.
Grade I	119
Grade II	46
Grade III	10
Grade IV	1

Table 6. Distribution as per Functional Grading

Complication	No.	%
Cardiac failure in pregnancy	5	2.76
Cardiac failure at caesarean	1	0.55
Cardiac failure postpartum	1	0.55
Arrhythmia requiring treatment	1	0.55
Infective endocarditis	1	0.55
Cardiac intervention in pregnancy	2	1.10

Table 7. Cardiac Complication in Pregnancy

DISCUSSION

Our study provides a contemporary assessment of maternal and neonatal risk associated with pregnancy in women with cardiac disease who are receiving comprehensive prenatal care. The proportion of women with cardiac disease in our study was 1.26%. The prevalence of cardiac disease in a review by K. Pushpalata is 4%.¹ The incidence of cardiac disease in women admitted for confinement was 1.3% in a rural tertiary care hospital in Maharashtra.² This is comparable with our study.

The proportion of congenital heart disease in our study is 60.22% and RHD is 36.46%. The proportion of congenital heart disease is 19.1% and RHD is 55.7% in a Brazilian study held from 1989 to 1999.³ The proportion of RHD is 77% in the study from Maharashtra.² In the study by Konar Hiralal in 2012 also, RHD was the most common cardiac disease complicating pregnancy amounting to 69.4%.⁴ But in a Canadian study, the most common cardiac disease in pregnancy is CHD (74%).⁵ This is similar to our study. In the publication by Cleveland Clinic on pregnancy and heart disease in 2014, the cardiovascular disease complicates 1-4% of pregnancies and congenital heart disease is the most common pre-existing condition.⁶

Our study had taken only women who delivered a foetus weighing ≥ 500 g. Late post-partum events were not included in the study. The Confidential Review of Maternal Deaths (CRMD), Kerala revealed a mortality of 6.8% of total maternal deaths due to cardiac disease in the period 2004 - 2006. Among these, RHD topped the list.⁷

In our study, the CHD was 60.22%. In this group, ASD was 42.73%. More than 50% of women with ASD had undergone corrective procedure before pregnancy. All the congenital CHD patients had good obstetric outcome. Complex congenital heart disease were rare. In our study, 48 women (26.52%) were detected to have cardiac disease during present or previous pregnancy. This stresses the important good antenatal care in reducing the morbidity and mortality associated with cardiac disease in pregnancy.

Majority of the caesarean deliveries were for obstetric reasons, commonest being a previous caesarean. Out of the preterm babies, 2 were iatrogenic preterm. One baby was delivered at 24 weeks of gestation for elective ventilation of mother- case of severe mitral stenosis. Second preterm was following a caesarean for ventilation of the mother in dilated cardiomyopathy. Out of the stillbirths, one was due to ruptured uterus. Another stillborn was that of a mother who had undergone MVR and had been on anticoagulants and irregular follow-up presented late in pregnancy. This shows

that prompt detection and good antenatal care improves the maternal and foetal outcome. Babies of 2 mothers with RHD had septal defects. Foetus of a mother with MVR who was on warfarin had small limbs.

Majority of the women with cardiac disease had uneventful course in pregnancy and labour. Cardiac failure is a dreaded complication in pregnancy. In our study 2.76% women had cardiac failure, but all were managed successfully. In another Indian study, cardiac failure was 7.4%.⁴ In our study population adverse cardiac events were with RHD and all were having severe disease. All the women in our study were seen in antenatal clinic and none presented for the first time in labour. This could be the reason for less complications when compared to a previous study in which few women had presented for the first time in labour.⁴

CONCLUSION

Cardiac disease complicating pregnancy is a high-risk situation and demands special attention throughout pregnancy and labour. Even though in developing countries, RHD is the most common lesion,^{2,3,4} our study had more CHD than RHD. The number of women with CHD becoming pregnant is increasing. So, obstetricians should be aware of complications and need for special care in these women. In our study, outcome of mothers was good. No maternal mortality was there. All women with cardiac failure were promptly diagnosed and managed. But women with Eisenmenger's syndrome, severe cardiomyopathy and pulmonary vascular disease may not tolerate pregnancy and there may be grave consequences. Proper evaluation of maternal prognosis prior to conception and adequate clinical follow-up during pregnancy are both fundamental measures for obtaining a satisfactory outcome in these patients. In Kerala, the maternal mortality due to direct obstetric causes is declining. But morbidity and mortality due to heart disease may increase due to more congenital heart disease undergoing correction, and pregnancy before adulthood. Hence, it is necessary that high-risk obstetric units are ready for that.

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