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FETOMATERNAL OUTCOME OF PREGNANCY WITH HEART DISEASE IN A TERTIARY CARE HOSPITAL OF KOLKATA IN EASTERN INDIA

Gynaecology

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ABSTRACT

BACKGROUND: Heart disease in pregnancy is still a major problem worldwide, particularly in low resource country like India. Its reported incidence varies between 0.1 to 4%. Heart disease complicates 1% to 3% of all pregnancies and is responsible for 10% to 15% of maternal mortality. In India, the rheumatic heart disease (RHD) contributes to approximately 70% of heart disease seen in pregnancy. Heart disease in pregnancy is associated with adverse fetomaternal outcome and has re-emerged as one of the leading causes of maternal mortality. The maternal mortality rate in women with cardiac disease is 7% and morbidity is 30% during pregnancy in India. **METHODS:** This study was a prospective observational study conducted in the IPGMER & SSKM Hospital, Kolkata, West Bengal from December 2020 to February 2021. 36 Pregnant women with heart disease were taken as study group. Multiple pregnancy and any other medical disorder like GDM, PIH, were excluded from study. Fetomaternal outcome, mode of delivery, prematurity, LBW, NICU admission and maternal and neonatal mortality were compared. Template was generated in MS excel sheet and analysis was done on SPSS software. **RESULTS:** Among 36 patients 14 (38.89%) patients belonged to age group 25-29 years and 2 (5.56) belonged to age group <20 years. 13 (36.11%) patients belonged to lower middle class and 17 (47.22%) belong to lower class. 19 (52.78%) patients were P_{0+0} and 9 (25%) were P_{1+0}parity group. 20 (55.56%) belong to gravida G1. 10 (27.78%) patients had CHD and RHD. 20 (55.56%) were normal delivery. 13 (36.11%) of babies were underweight. Maternal death were 2 (5.56%). **CONCLUSIONS:** Feto-maternal outcome can be improved appreciably by antenatal care, early diagnosis and management.

KEYWORDS

Feto-maternal outcome, heart disease, pregnancy

INTRODUCTION:

Heart disease during pregnancy is still a major problem worldwide. Heart disease in pregnancy is of great clinical significance both to the cardiologist & obstetrician. Cardiovascular disease complicates around 1- 3% of all pregnancy and responsible for 10-15% of maternal death[1-3]. Although prevalence is low but now a days it is the leading cause of maternal death internationally[4]. Since more women with congenital or acquired heart disease are reaching child bearing age due to improved medical and surgical care, the incidence of cardiovascular disease in pregnancy is increasing. There is marked hemodynamic changes during pregnancy. The pregnant women is in a hyper-dynamic and volume-overloaded state as a result of physiological changes. These changes result in increased demand on the cardiovascular system. In normal women the cardiac reserve is sufficient to accommodate this increased work load. However, women with underlying heart disease cannot tolerate these additional hemodynamic burden of pregnancy. So there may be significant risk to the mother, fetus or both. Therefore, pregnancy may exaggerate underlying disease, resulting in increased morbidity and mortality. Despite advancement in medical care, heart disease in pregnancy is associated with high maternal and perinatal morbidity and mortality particularly in developing countries[5]. This study was done to enlighten the total incidence of pregnancy with heart disease and its effects on pregnancy outcomes in term of maternal and perinatal morbidity & mortality as there were few studies in India done regarding cardiac disease in pregnancy.

The maternal mortality rate in women with cardiac disease is 7% and morbidity is 30% during pregnancy in India.[6,7] It is an important indirect cause of maternal mortality in India. There are very few studies available in India that is prospective, focused particularly on heart disease in pregnancy. Most studies were retrospective and used small sample size.

Hence, present study was undertaken study the Fetomaternal Outcome of Pregnancy with Heart Disease in a Tertiary Care Hospital of Kolkata in Eastern India

METHOD AND MATERIALS:

Study setting:

Department of Obstetrics and Gynecology, IPGMER & SSKM Hospital, Kolkata.

Time line: December 2020 to February 2021

Definition of problem: In the developing country like India along with hemodynamic changes, the presence of complicating factor like anemia, under reporting disease, inadequate antenatal care and poor socio-economic condition add to the high maternal death to the cardiac disease in pregnancy.

Inclusion Criteria: Women with diagnosed heart disease with pregnancy admitted through Out-Patient-Department (OPD) and Emergency of Department of Obstetrics and Gynecology, IPGMER & SSKM Hospital, Kolkata..

Exclusion criteria : Mothers with medical disorder other than cardiac disease.

Sample size: All reported diagnosed case of cardiac disease with pregnancy fulfilling inclusion and exclusion criteria admitted through OPD and Emergency of Obstetrics and Gynecology, IPGMER & SSKM Hospital, Kolkata. during the study period.

Method of data collection: Data were collected from ward, labor room, OT record sheet, neonatal units. Predesigned record sheet was filled up.

Study design: Observational Study

Study tool

A : Detailed History

1) Age
2) Parity
3) Gestational Age
4) Socio-economic Status
5) Obstetrics history
6) Past history of any cardiological event

B : Clinical Examination

1) Obstetrics Examination
2) Cardiovascular & Respiratory System Examination

36 cases were studied in this observational study. Ethical permission was taken. The patients fulfilled the inclusion criteria were selected and recruited for the study. Written informed consent was taken for participation in the study. Previous medical history relevant to heart disease such as past history of rheumatic fever, consultation with cardiologist, taking of medicine or any previous history of heart failure

were also evaluated. Past surgical history especially cardiac operation was taken with special reference to type of operation, type of lesion and clinical improvement. A careful supervision was made on each labor case & mode of delivery was evaluated. All the patients after discharge were advised to come OPD for follow up 6 week after delivery, and to consult cardiologist.

RESULTS :

This prospective study was conducted in IPGMER & SSKM Hospital, Kolkata from December 2020 to February 2021 in the department of obstetrics and gynaecology. 36 patients with heart disease were taken. During the course of study total 1400 deliveries were conducted in present tertiary care institution. The incidence of heart disease was 2.57% during the study duration.

Table 1: Socio-demographic distribution of the study participants (n=36).

Socio-demographic profile		Frequency	
		Number	%
Age	< 20 years	2	5.56
	20 – 24 years	11	30.56
	25 -29 years	14	38.89
	30 – 34 years	7	19.44
	≥35 years	2	5.56
	Total	**36**	**100**
Economic status	Upper Middle class	6	16.67
	Lower Middle class	13	36.11
	Lower class	17	47.22
Religion	Muslim	17	47.22
	Hindu	19	52.78

Table 1 showed that among 36 patients 14 (38.89%) patients belonged to age group 25-29 years and 2 (5.56) belonged to age group <20 years. 13 (36.11%) patients belonged to lower middle class and 17 (47.22%) belong to lower class. Majority of the patients 19 (52.78%) were Hindu followed by Muslim 17 (47.22%).

Table 2 : Distribution of study participants according to Parity, Gravidity, Functional Classification on admission (NYHA), and Gestational age (n=36)

Parameters	Frequency	
	No. of Patient	Percentage (%)
Parity		
P0+0	19	52.78
P1+0	9	25.00
P1+1	1	2.78
P0+1	2	5.56
P2+0	2	5.56
P2+1	2	5.56
P3+1	1	2.78
Total	**36**	**100**
Gravida		
G1	20	55.56
G2	10	27.78
G3	4	11.11
G4 and Above	2	5.56
Total	**36**	**100**
Functional Classification on admission (NYHA)		
Class I	17	47.20
Class II	12	33.30
Class III	5	13.90
Class IV	2	5.60
Total	**36**	**100.0**
Gestational age		
< 37 weeks	11	30.56
37-40 weeks	23	63.89
> 40 weeks	2	5.56
Total	**36**	**100.00**

Table 2 showed that 19 (52.78%) patients were P_{0+0} and 9 (25%) were P_{1+0}parity group. Majority of them were primigravidae i.e. 20 (55.56%) followed by second gravidae 10 (27.78%). NYHA classification at the time of admission denotes that 17 (47.2%) of the women were NYHS class I, 12 (33.30%) were class II, 5 (13.90) were class II and 2 (5.60%) were class IV. Gestational age of 23 (63.56%) patients have gestational period of 37.40 weeks followed by 11 (30.56%) have gestational age < 37 weeks.

Table 3 : Depicted types of Heart Disease (n=36)

Type of Heart disease	No. of patient	Percentage (%)
AR	1	2.8
CHD	2	5.6
CHD, ASD	5	13.9
CHD, CSD	1	2.8
CHD, VSD	2	5.6
Chronic HTN	1	2.8
Dilated Cardiopathy	2	5.6
Heart Block	1	2.8
IHD, MI	1	2.8
MR	2	5.6
MS	1	2.8
PPCM, PIH with GDM	1	2.8
RHD	1	2.8
RHD, MR	3	8.3
RHD, MR, MS	2	5.6
RHD, MS	4	11.1
SVT	2	5.6
Tachycardia	1	2.8
TR	1	2.8
VSD	1	2.8
WPW syndrome, SVT	1	2.8
Total	**36**	**100.0**

Table 3 we came to know 10 (27.78%) patients had CHD and 10 (27.78%) RHD which highlighted that the heart disease of rheumatic origin is still rampant in our country.

Table 4 : Distribution of according to Mode of delivery, Maternal Complications, Perinatal Outcome and Birth weight.

Parameters	Frequency	
	No. of Patient	Percentage (%)
Mode of delivery		
Normal	20	55.56
Instrumental (Forceps)	2	5.56
LSCS	14	38.89
Total	**36**	100.00
Birth Weight		
< 2 kg	7	19.44
2 – 2.4 kg	6	16.67
2.5 – 3 kg	16	44.44
> 3 kg	7	19.44
Total	**36**	**100.00**
Maternal Complications		
Pulmonary Hypertension	2	5.56
Convulsion	1	2.78
Maternal Death	2	5.56
Perinatal Outcome		
Low Birth Weight	13	36.11
Preterm	1	2.78
IUFD	1	2.78
IUGR	1	2.78
Neonatal Death	1	2.78

Table 4 showed that 20 (55.56%) were normal delivery, 14 (38.89%) were LSCS and 2 (5.56%0 were Instrumental (Forceps) delivery. Birth weight record shows a high incidence of low birth weight babies born to theme mothers (below 2 kg 7 (19.44%) and 2-2.4 kg 6 (16.67%). 16 (44.44%) babies were between 2.5 and 3 kg range. 7 (19.44%) babies were above 3 kg. while in maternal complication 2 (5.56%) have pulmonary hypertension, 1 (2.78%) have convulsion and maternal death occurred in 2 (5.56%) cases. As far as perinatal outcome is concerned 13 (36.11%) of babies were underweight. Neonatal death was 1 (2.78%).

DISCUSSION

Most studies in pregnant women with heart disease were done by

cardiologist and worsening of cardiac status was taken as adverse outcome. This prospective study was conducted in IPGMER & SSKM Hospital, Kolkata from December 2020 to February 2021. 36 cardiac patients were taken. The incidence of heart disease in pregnancy in present study was 2.57%, similar to the incidence seen in other earlier Indian studies.[8-11]

In our study among 36 patients 14 (38.89%) patients belonged to age group 25-29 years and 2 (5.56) belonged to age group <20 years. 13 (36.11%) patients belonged to lower middle class and 17 (47.22%) belong to lower class. Majority of the patients 19 (52.78%) were Hindu followed by Muslim 17 (47.22%).

In an Indian study done by Hiralal K et al found that increased maternal age was a risk factor for poor maternal and neonatal outcome which was not observed in the present study.[12]

In the present study 19 (52.78%) patients were P_{0+0} and 9 (25%) were P_{1+0}parity group. Majority of them were primigravidae i.e. 20 (55.56%) followed by second gravidae 10 (27.78%). NYHA classification at the time of admission denotes that 17 (47.2%) of the women were NYHS class I, 12 (33.30%) were class II, 5 (13.90) were class II and 2 (5.60%) were class IV. Gestational age of 23 (63.56%) patients have gestational period of 37.40 weeks followed by 11 (30.56%) have gestational age < 37 weeks.

Sheela CN et al in their study done in 2009 found that parity was not significantly associated with any adverse maternal outcome which was in corroboration with the present study.[10] Martin LC et al in 2016 conducted a study in which he concluded that maternal age, parity and enrolment in third trimester were not associated with adverse fetomaternal outcome.[13] After reviewing the literature also authors found that preterm delivery is more common in heart disease than in normal pregnancy.[14,15]

Present study showed that 10 (27.78%) patients had CHD and 10 (27.78%) RHD which highlighted that the heart disease of rheumatic origin is still rampant in our country.

Most previous studies done in developing countries also showed the similar result.[12,15-17]

Our study revealed that 20 (55.56%) were normal delivery, 14 (38.89%) were LSCS and 2 (5.56%0 were Instrumental (Forceps) delivery. Similar findings were observed in other Indian studies.[12,9-11]

Birth weight record shows a high incidence of low birth weight babies born to theme mothers (below 2 kg 7 (19.44%) and 2-2.4 kg 6 (16.67%). 16 (44.44%) babies were between 2.5 and 3 kg range. 7 (19.44%) babies were above 3 kg. while in maternal complication 2 (5.56%) have pulmonary hypertension, 1 (2.78%) have convulsion and maternal death occurred in 2 (5.56%) cases. Whereas some studies reported maternal mortality.[12,18]

As far as perinatal outcome is concerned 13 (36.11%) of babies were underweight. Neonatal death was 1 (2.78%).

Conclusion and Recommendations :

Heart disease with pregnancy is one of the important causes of maternal death. Rheumatic heart disease is still the commonest cause of heart disease and mitral valve is the commonly affected area. Improvement of standard of living can reduce the incidence of rheumatic fever which in turn capable of lowering RHD. Maternal morbidity and mortality due to heart disease can be reduced appreciably by antenatal care, early diagnosis and management with the help of cardiologist & surgery in selected cases. Recent advancement in cardiology may result in more successful treatment of pregnant cardiac patients

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