

Study Of Maternal And Fetal Outcome In Pregnancy with Heart Disease In A Tertiary Care Hospital

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Abstract: Background : Heart disease in pregnancy is an important cause of maternal morbidity and accounts for about 10-25 % of maternal mortality . It also influences fetal outcome and perinatal morbidity. Hence this study aims to determine the maternal and fetal outcome in pregnant mothers with heart disease.

Methods : This is a retrospective study conducted in the department of Obstetrics and Gynecology, Government Mohan Kumaramangalam Medical college Hospital , a tertiary care centre , Tamil Nadu , India . 105 Antenatal mothers with previously established heart disease or diagnosed during pregnancy were taken for the study.

Results : In our study heart disease accounted for 0.62% of total admissions. Most of the mothers presented in the age group of 21-25yrs, accounting for about 40% of total pregnant mothers with heart disease. 49.5% were Primigravida and almost all mothers were booked at Primary Health Centres for antenatal care in the first trimester. Most common complaint on admission was breathlessness which accounted for 39% . Rheumatic heart disease is the the most common heart disease in pregnancy in the current study accounts for about 55.2% of total pregnant patients with heart disease. 31.4% of heart disease mothers had anemia as co-morbid risk factor. vaginal delivery was established in 52.5% of patients, 30.4% had emergency caesarean section. and 85% had live births. Maternal death accounted for 4.8% of total cardiac cases and 11.9% among total maternal deaths during the study period between Jan 2017 to Dec 2017.

Conclusion: Prepregnancy evaluation and counseling is necessary for high risk cardiac cases to avoid unnecessary medical termination of pregnancy in these patients . Also 16.2 % were newly diagnosed to have cardiac disease during current pregnancy. So proper evaluation for cardiac disease in all pregnant women with any cardiac symptoms is very much important to detect new patients with cardiac disease .

Keywords: Heart disease , pregnancy

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I. Introduction

Prevalence of heart disease in pregnancy averages about 0.3-3.5% worldwide (1). Pregnancy makes a significant demand on the cardiovascular system. In presence of maternal heart disease, the circulatory changes of pregnancy may result in decompensation of heart (2). Common complaints of normal pregnancy such as dyspnea, fatigue, palpitation, orthopnea and pedal edema mimic symptoms of worsening heart disease and can create challenges for clinicians when evaluating pregnant women with heart disease. Maternal functional status is the most important predictor of outcome and most often it is defined by NYHA functional status (3). Poor functional status is associated with adverse maternal outcome (4). Cardiac disease contributes to 10-25% of maternal deaths(5) and has got increased perinatal morbidity and mortality. Hence heart disease in a pregnant women can present as a challenge to the obstetrician, cardiologist, and neonatologist.. In developed countries, Rheumatic heart disease (RHD) has decreased and Congenital heart disease (CHD) is three times more common than RHD, whereas in developing countries, RHD remains as the most common heart disease in pregnancy. In developing countries like India, anemia is a major associated factor that precipitates heart failure. Heart disease is one of the most important indirect cause of maternal mortality in India.

II. Materials And Methods

This is a retrospective study of pregnant mothers with Heart disease admitted antenatally with known heart disease or newly diagnosed to have heart disease during the period from January 2017 to December 2017 at the Department of Obstetrics and Gynaecology, Government Mohan Kumaramangalam Medical College Hospital, Salem, Tamil Nadu. Pregnant mothers admitted and treated during this period were taken for study. All the required data were collected from Medical Records Department. Age, gravida, type of heart disease, mode of delivery, pregnancy and neonatal outcome were analysed.

III. Results

During the study period, for the total maternity admissions of about 16,950 , patients admitted with heart disease were 105, accounting for 0.62% of total admissions, Most of the mothers presented in the age group of 21-25yrs, accounting for about 40% of total pregnant mothers with heart disease.

Table 1: Age Distribution

S.NO	AGE (years)	NO.OF CASES	PERCENTAGE
1	<20	21	20%
2	21-25	42	40%
3	26-30	30	28.5%
4	31-35	9	8.6%
5	>35	3	2.9%

49.5% were primigravida and almost all mothers were booked at health centres for antenatal care in the first trimester except for two cases (1.90 %) who presented late in pregnancy. Among the two patients, one was unmarried.

Table 2: Parity Distribution

S.NO	GRAVIDA	NO.OF CASES	PERCENTAGE
1	Primi	52	49.5%
2	G ₂	28	26.7%
3	G ₃	18	17.1%
4	G ₄ and above	7	6.7%

71.4% of mothers were referred from Primary Health Centres, Government Hospitals and District Head Quarters Hospitals and 28.6% were admitted directly to our hospital .

Table 3: Referral Cases

S.NO	REFERRAL CASES	NO. OF CASES	PERCENTAGE
1	Referral from other health centres	75	71.4%
2	Direct admissions in GMKMCH	30	28.6%

Most common complaint on admission was breathlessness which accounted for 39% of cases . 35% were admitted with obstetric complaints and 14% were admitted without any complaints for safe confinement at around 36weeks of gestation. Heart disease was diagnosed in childhood in 45.7% of cases, during adult life in 27.6% of cases, during antenatal period in 10.5% and in 16.2% of mothers were newly detected as having heart disease after admission for delivery with cardiac symptoms .

Table 4: Period Of Diagnosis Of Heart Disease

S.NO	PERIOD OF DIAGNOSIS	NO.OF CASES	PERCENTAGE
1	Childhood	48	45.7%
2	Adult life	29	27.6%
3	Antenatal period	11	10.5%
4	Newly diagnosed after admission	17	16.2%

Rheumatic heart disease is the the most common heart disease in pregnancy in the current study accounts for about 55.2% of total pregnant patients with heart disease. Congenital heart disease accounted for about 35.2% of cases. PPCM accounted for 5.7% of cases and all of which were newly diagnosed after admission to hospital.

Table 5: Types Of Heart Disease

S.NO	TYPES OF HEART DISEASE	NO.OF CASES	PERCENTAGE
1	Rheumatic heart disease	58	55.2%
2	Congenital heart disease	37	35.2%
3	Peripartum cardiomyopathy	6	5.7%
4	Dilated cardiomyopathy	2	1.9%
5	Primary pulmonary hypertension	1	0.9%
6	Myocardial infarction	1	0.9%

Among RHD, Mitral stenosis was the most common seen in 18.1% of total cardiac mothers, Mitral regurgitation accounted for 17.1 % in total . Both MS and MR were seen in 6.9% ,

Table 6: Types Of Valvular Lesions In Rhd

S.NO	VALVULAR LESIONS	NO.OF CASES	% (Among total heart disease)
1	Mitral stenosis	19	18.1%
2	Mitral regurgitation	18	17.1%
3	Post valvular replacement	8	7.6%
3	Mitral stenosis and Mitral regurgitation	7	6.7%
4	Aortic stenosis	2	1.9%
5	Tricuspid regurgitation	2	1.9%
6	Aortic regurgitation	1	0.95%
7	MR + AR	1	0.95%

22.4% of RHD were operated with various cardiac surgeries like MVR, AVR, , DVR, BMV, PTMC and BAV. Totally 8 cases were operated with valve replacement , among which MVR was done in 6 cases, AVR was done in 1 case and DVR(mitral and aortic) was done in one case .

Table 7: Operated Rhd Cases

S.NO	CORRECTIVE SURGERIES	NO.OF CASES	PERCENTAGE
1	Mitral valve replacement	6	5.7%
2	Aortic valve replacement	1	0.95%
3	Double valve replacement	1	0.95%
4	Balloon mitral valvotomy	1	0.95%
5	Percutaneous trans mitral commissurotomy	3	2.85%
6	Balloon aortic valvotomy	1	0.95%

8 patients were on anticoagulant therapy. 26 patients were on penicillin and antifailure drugs. 22 patients were on penicillin alone. 2 patients were on irregular treatment.

Table 8: Treatment Modalities

S.NO	TREATMENT MODALITY	NO.OF CASES	PERCENTAGE
1	Anticoagulant therapy	8	7.6%
2	Penicillin and antifailure drugs	26	24.7%
3	Penicillin alone	22	20.95%
4	Irregular treatment	2	1.9%

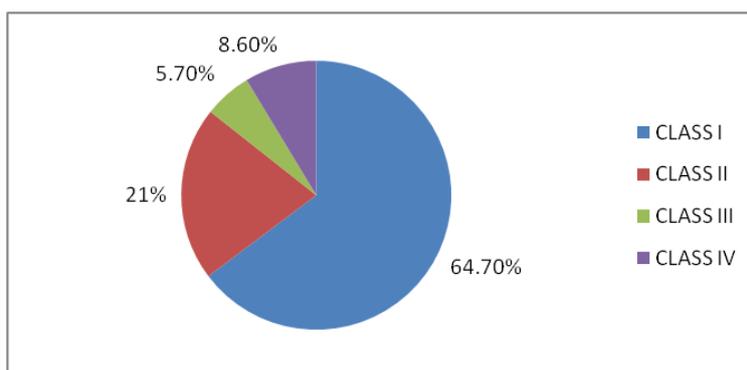
Among CHD, ASD accounted for the most common congenital heart disease in our institution, which accounted for 51.3% of congenital cardiac cases, of which 36.8% were operated with patch closure in childhood. VSD accounted for 29.7% of total CHD patients and one case of VSD has bidirectional shunt.

Table 9: Types Of Congenital Heart Disease

S.NO	TYPE OF CONGENITAL HEART DISEASE	TOTAL CASES	PERCENTAGE (Among CHD)	OPERATED IN CHILDHOOD	NOT OPERATED
1	ASD	19	51.3%	7	12
2	VSD	11	29.7%	3	8
3	TOF	3	8.1%	2	1
4	PDA	2	5.4%	2	0
5	Ebstein anomaly	1	2.7%	1	0
6	Bicuspid aortic valve	1	2.7%	0	1

64.7% were in functional class I of NYHA, 21% in class II, 5.7% were in class III and 8.6% in class IV.

Fig 1: Nyha Class



31.4% of heart disease mothers had anemia as co-morbid risk factor. All were managed with blood transfusion and anemia corrected. Preeclampsia was associated in 16.2% of heart disease mothers, which was one of the important indication for labour induction.

Table 10: Associated Comorbid Conditions

S.NO	ASSOCIATED COMORBIDITIES	NO.OF CASES	PERCENTAGE
1	Anemia	33	31.4%
2	Preeclampsia	17	16.2%
3	Insulin Dependant Diabetes Mellitus	1	0.95%
4	GDM	1	0.95%
5	Hyperthyroid	2	1.90%
6	Hypothyroid	1	0.95%
7	LRI	4	3.8%

Spontaneous labour occurred in 65.7% of cases while labour was induced in 17.1% of patients. 5.8% patients had MTP in view of high cardiac risk. 2.9% had spontaneous abortion. 2 patients (1.9%) had ectopic pregnancy operated and elective LSCS done in 5.7% of patients.

Table 11: Onset Of Labour

S.NO	ONSET OF LABOUR	NO.OF CASES	PERCENTAGE
1	Spontaneous	69	65.7%
2	Induced	18	17.1%
3	Elective LSCS	6	5.7%
4	Abortion	9	8.6%
5	ectopic	2	1.9%
6	Undelivered	1	0.95%

Among the heart disease mothers, vaginal delivery was established in 52.5% of patients, 30.4% had emergency caesarean section.

Table 12: Mode of Delivery in Patients of Spontaneous and Induced Labour

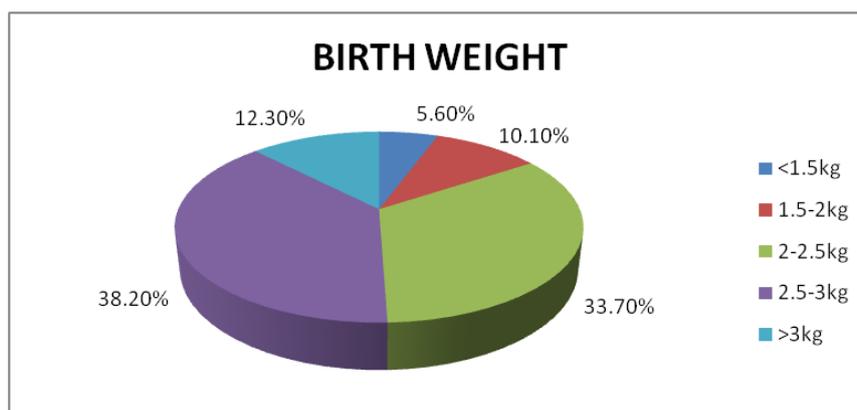
S.NO	MODE OF DELIVERY	NO.OF CASES	PERCENTAGE
1	Normal vaginal delivery	26	24.8%
2	Outlet forceps delivery	23	22%
3	Vacuum extraction	6	5.7%
4	Emergency LSCS	32	30.4%

In our study 85% had live births. NICU admission was about 20.2% of total deliveries and there was no neonatal deaths.

Table 13: Fetal Outcome

S.NO	FETAL OUTCOME	NO.OF CASES	PERCENTAGE
1	Live birth	89	84.8%
2	IUD/ Still born	4	3.8%
3	Abortion	9	8.6%
4	Ectopic pregnancy	2	1.9%
5	Undelivered	1	0.95%

Fig 2: Birth Weight Of Liveborn Babies



Total maternal death among cardiac patients was 5 cases which accounted for 4.8% of total cardiac cases and 11.9% among total maternal deaths during the period Jan 2017- Dec 2017. Almost all cases were in NYHA III and IV

Table 14: Causes Of Maternal Death

S.NO	CAUSE OF MATERNAL DEATH	NO.OF CASES	NYHA CLASS ON ADMISSION
1	Severe MS with pulmonary hypertension	2	IV
2	VSD with Eisenmenger syndrome	1	IV
3	k/c/o DCMP with hyperthyroid	1	III
4	PPCM	1	III

IV. Discussion

Prevalence of heart disease in pregnancy in our study was 0.62 % which was similar to the study by Indira et al (6) from Tirupati which accounted for about 0.43% .In our study, majority of the patients were in the age group between 21-25years accounting for 40%, which was comparable to the study by Saima Salam et al (7) from J&K which showed 37.8% in the similar age group. About 49.5% of patients were primigravida which was compared to the study by Indira et al from Tirupati which accounted for about 42%.

In this study, heart disease was diagnosed before pregnancy in 73.3% of mothers, and after pregnancy in 26.7% of mothers, which is comparable to the study by S.Abbasi et al (8) which showed 62.7% were diagnosed with heart disease before pregnancy and 37.3% were diagnosed after pregnancy. RHD is the primary cardiac disease observed in 55.2% of patients with heart disease. Similar results were observed in the study by Saima Salam et al where the RHD was about 56.6%.

Among RHD, mitral stenosis was the most common valvular lesion which accounted for 18% of total cardiac cases which is similar to the study by Vidhyadhar et al (9) and Mazhar SB et al (10) which also showed mitral stenosis was the most common lesion.

CHD accounted for 35.2% of cases and ASD being the most common congenital heart disease. Similar results were observed in the study by Indira et al from Tirupati, Andhra Pradesh showed 45.5 % and by Hiralal Konar et al.⁽¹¹⁾ More than 50% of the cases with ASD were operated in childhood itself. 85.7% of pregnant mothers with heart disease presented with class I and II of NYHA functional classification in the current study which is comparable to the study by Abbasi et al where it was 88.2% in class I and II

Anemia was associated in 31.4% of cases and preeclampsia in 16.2% of cases in the current study. This is compared to the study by Abbasi et al, where the anemia was about 47.1% and preeclampsia was about 21.6% of cases similar findings were observed in the study by Indira et al from Tirupati. Spontaneous labour occurred in 65.7% of cases in our study and labour induction was done in 17.1% of cases. Similar induction rates were observed in the study by Godavari et al (12) from Haldwani, Uttarkhand, India where it was 19% labour induction. Most important cause for labour induction being severe preeclampsia, PROM and postdated pregnancy in our study.

Normal vaginal delivery was established in 24.8% of total cases, outlet forceps delivery being 22% and vacuum delivery of about 5.7%. This was compared with study by Vidyadhar et al which showed 62.8% of vaginal deliveries and it was 59.1% in our study.Total caesarean delivery(both emergency and elective) was 36.1% which is comparable to the study by Saima Salam et al, where it was 36.7%. Spontaneous abortion occurred in 5.8% of heart disease mothers and 1st trimester MTP was done in 2.9% of patients in our study. This is comparable to the study by Saima Salam et al where the inevitable abortion was 7.8% and MTP was done in 2.2% of cases

Total birth was 93, of which 89 were live births (81.1%) and 4 being still born(4.3%). This is similar to the study by Godawari et al where the live born being 90.5%. 18 babies (20.2%) were admitted in NICU which is similar to the study done by Abbasi et al which showed 25.5% of neonatal admissions.⁹

There were five maternal deaths in our study accounting for 11.9% of maternal mortality in the year 2017. The cause of death were severe MS with Pulmonary hypertension in 2 cases, VSD with Eisenmenger syndrome in one case, other two cases were died due to Dilated cardiomyopathy with hyperthyroidism, peripartum cardiomyopathy respectively. All cases were in NYHA class III and IV which is similar to Subbaiah et al (13) which showed pregnancy with NYHA III/IV was associated with high maternal morbidity and mortality.

V. Conclusion

Heart diseases in pregnancy has a major impact on pregnancy outcome .Proper evaluation of maternal functional status and cardiac disease in early pregnancy is important for satisfactory outcome in these patients . Our study concluded that prepregnancy evaluation and counselling is necessary for high risk cardiac cases to avoid unnecessary medical termination of pregnancy in these patients . Also 16.2 % were newly diagnosed to have cardiac disease during current pregnancy. so proper evaluation for cardiac disease in all pregnant women with any cardiac symptoms is very much important to detect any cardiac disease . And anemia was seen in 31.4 % of pregnant cardiac mothers. correction of anemia in these patients should be given importance so as to prevent patients going for cardiac failure and hence maternal morbidity and mortality.

References

- [1]. McFaul P, Dornan J, Lamki H, et al. Pregnancy complicated by maternal heart disease. A review of 519 women. *Br J Obstet Gynaecol.* 1998;95:861-867. [PubMed]
- [2]. Berg CJ, Atrash HK, Koonin LM, et al. Pregnancy related mortality in the United States, 1987-1990. *Obstet Gynecol* 1996;88(2):161-7.
- [3]. James, Steer, High risk pregnancy management option. In *Cardiac disease in pregnancy*. 4th edition: 2012; 627-656.
- [4]. Bhatla, Yadav, Mishra. The cardiac case. In *Ian Donald,s practical obstetrics problems*. 6th edition. BI Publications Pvt Ltd India.2010; 103-126.
- [5]. Berg CJ, Chang J, Callaghan WM, et al. Pregnancy related mortality in the United States, 1991-1997. *Obstet Gynecol* 2003;101(2):289-96.
- [6]. Indira, K. Sunitha and Jyothi. Study of Pregnancy Outcome in Maternal Heart Disease. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* e-ISSN: 2279-0853, p-ISSN: 2279-0861. Volume 14, Issue 7 Ver.IV (July. 2015). PP 06-10.
- [7]. Saima Salam, Saba Mushtaq, Khalid Mohi-ud-Din, et al. Maternal and fetal outcome in pregnancy with heart disease in tertiary care hospital in India. *Int J Reprod Contracept Obstet Gynecol.*2017 Sep;6(9): 3947-3951.
- [8]. S Abbasi, SF Siddiqui, S Rijvi, et al. Study of Maternal and Fetal Outcome in Pregnancy with Heart Disease. *J Am Heart Assoc.* 2014;3:e000712; originally published June 5,2014; doi: 10.1161/JAHA.113.000712
- [9]. Bangal VB, Singh RK, Shinde KK. Clinical study of heart disease complicating pregnancy. *IOSR.*2012;2(4): 25-8.
- [10]. Mazhar SB. Fetomaternal outcome in pregnancy with cardiac disease. *JCPSP.* 2005;15(8):476-80
- [11]. Hiralal Konar and Snehamay Chaudhuri. Pregnancy Complicated by Maternal Heart Disease: A Review of 281 Women. *Journal of Obstetrics and Gynaecology of India*
- [12]. Godawari Joshu, Subhash C. Joshi, Sanjay K.Jha. et al. Maternal heart disease and pregnancy outcome: Findings from a retrospective cohort in a tertiary care government hospital in Haldwani, Nainital. *Nigerian Journal of Cardiology/ July- December 2015/ Vol 12/ Issue 2*
- [13]. Subbaiah M, Sharma V, Kumar S. Heart disease in pregnancy: cardiac and obstetric outcomes. *Arch Gynecol Obstet.* 2013; (288):23-7.