



## STUDY OF MATERNAL AND PERINATAL OUTCOME IN HEART DISEASE COMPLICATING PREGNANCY IN A TERTIARY CARE HOSPITAL

### Medical Science

**SHANTHAVIBALA** SENIOR ASSISTANT PROFESSOR, GOVT THENI MEDICAL COLLEGE, THENI

**SHANTHIRANI** ASSISTANT PROFESSOR, GOVT THENI MEDICAL COLLEGE, THENI

### ABSTRACT

**INTRODUCTION:** cardiovascular disease (CVD) complicates 1% to 4% of pregnancies. Increasing maternal age, obesity, diabetes, and hypertension rare important risk factors. proper counselling of patients prior to pregnancy and appropriately managing patients during pregnancy is of vital importance. Risk of adverse outcome is more in rural population as compared to its urban counterpart.

**MATERIALS AND METHODS:** A cross sectional clinical study of cases of pregnancy complicated by heart disease, reporting to govt theni medical college for delivery during jan 2015-dec 2015, was carried out to find out the incidence and maternal and fetal outcome.

**RESULTS:** The incidence of heart disease in pregnancy in the present study was 1.97 %. Most of the women (83 %) belonged to low socioeconomic class in the rural population. Rheumatic heart lesions constituted 76.6% of the cases. Mitral stenosis was the commonest lesion in 40% of cases. Twenty two (62.8%) women delivered spontaneously vaginally at term and 4 (11%) delivered prematurely. There were 7 (20%) cases of prophylactic forceps delivery. Cesarean section was performed in 2 cases. There was no maternal death. The perinatal mortality was 40 per 1000 live births.

**CONCLUSION:** proper preconceptional counselling, early diagnosis of heart disease, frequent and regular antenatal check up, institutional delivery, contraceptive advice can lower the maternal and perinatal mortality and morbidity associated with heart disease.

### KEYWORDS:

Heart disease, Rheumatic heart disease, Maternal mortality

### INTRODUCTION

Major hemodynamic changes occur during pregnancy, labor and delivery, and the postpartum period. These changes occur during first 5 to 8 weeks of pregnancy and peak in the second trimester.<sup>1,2</sup>

Blood volume increases 40% to 50% during normal pregnancy and exceeds the increase in red blood cell mass, contributing to the fall in hemoglobin concentration. Cardiac output rises 30% to 50% above baseline, peaking at the end of the second trimester and reaching a plateau until delivery. This rise in cardiac output is due to an increase in preload due to greater blood volume, reduced afterload due to a fall in systemic vascular resistance and a rise in the maternal heart rate by 10 to 15 beats per minute.

Stroke volume increases during the first and second trimesters but declines in the third trimester due to compression of the inferior vena cava by the uterus, at which point heart rate is the major factor in the increase in cardiac output. Hemodynamic changes during normal pregnancy are well tolerated by women with normal cardiac reserve. In patients with preexisting heart disease, cardiac decompensation often occurs with resultant increase in morbidity and mortality. Since fetal life depends upon continuous supply of well-oxygenated maternal blood, these patients contribute to perinatal mortality and morbidity in the form of fetal growth restriction, premature birth or may even fetal death.

Rheumatic heart disease is the most common etiological factor for heart disease complicating pregnancy. Streptococcal infections in childhood especially in rural areas with poor sanitary conditions contribute to RHD.<sup>3,4,5</sup> Women having additional obstetrical complications further worsen the prognosis. Heart disease is one of the 3 major indirect causes of maternal mortality in India. The primary objective of the present study was to study the demographic features in heart disease complicating pregnancy and to assess the effect of heart disease on maternal and fetal health.

### MATERIAL AND METHODS

This is a cross sectional study carried out at Govt Theni medical college, Tamilnadu during Jan 2016-Dec 2016. This study included antenatal women who are diagnosed to be having heart disease.

History regarding heart disease and obstetric history were asked. Detailed history in regard to cardiac lesion was asked. Thorough

clinical examination was done to find out the type of cardiac lesion, any signs of failure and gestational age. All cases were investigated with ECG and ECHO cardiography and cardiologist opinion were sought for each case.

Cases were graded as per NYHA classification of grade of heart disease. They were told about the importance of rest, medication and regular visits. Patients were told to have compulsory institutional delivery. Cases reporting during labour were managed as per the cardiac conditions. Patients were kept for 2 weeks after delivery and were discharged with advice about contraception, breast feeding and penicillin prophylaxis.

### RESULTS

The total deliveries during the study period were 2381. This included 47 cases of heart disease with different lesions. Thus, the incidence of heart disease in pregnancy in the present study was 1.97%.

Among the study population, most of the cases were booked in first trimester 44.68% as in table 1. The commonest age group of distribution was between 20-25 yrs (63.8%) followed by 25-30 yrs (27.7%).

**Table 1: Distribution of cases as per timing of registration (N=47)**

Trimester of registration	No of patients	Percentage
First trimester	21	44.68
Second trimester	12	25.53
Third trimester	9	19.14
Unbooked	7	14.9

Among the study population, majority were primigravida (42.6%) followed by second gravid (40.4%). Multigravida constituted 17 % of the study population. Majority were inhabitants of rural area 83% and urban 13%. Around 44.17% had completed primary education and 36.17% were illiterates as in table 2

**Table 2: socio demographic variables of study population (n=47)**

Variables	Number	percentage
Age		
<20	2	4.2
20-25	30	63.8
25-30	13	27.7
>35	2	4.2

Parity		
Primi	20	42.6
Second gravida	19	40.42
multigravida	8	17.02
Habitant		
Rural	39	83
Urban	8	17
Literacy		
Illiterate	17	36.17
Primary	21	44.7
Secondary	7	14.9
graduate	2	4.2

Rhematic heart disease is the most common cardiac lesion accounting for 76.6% and congenital heart disease accounts to 23.4%.most of them 76.6% were delivered by LSCS for various obstetric and medical reasons followed by prophylactic forceps 23.32% which is shown in Table 3.

**Table 3: Nature of heart disease and mode of termination**

Nature of heart disease	number	Percentage
Congenital	11	23.4
acquired	36	76.6
Mode of delievery	9	19.14
Labour natural	2	4.2
Prophylactic outlet forceps	36	76.6
Lscs		

The various cardiac lesions observed in study population of this study are shown table 4.this shows mitral stenosis is the most common cardiac lesion (23.4%) followed by mitral valve prolapse with trivial MR being the next most common (17.02%) and Post ASD closure constituted 12.76% of the cases as in Table 4

**Table 4:distribution of cardiac lesion among study population (N=47)**

Type of lesion	Number	Percentage
Mitral stenosis	11	23.4
Mitral REGURGITATION	4	8.5
MVP WITH MR	8	17.02
MS WITH MR	4	8.5
MS WITH PHT	3	6.3
MS with AR	1	2.1
VSD	5	10.63
POST ASD CLOSURE	6	12.76
EISENMENGER SYNDROME	1	2.1
PDA	1	2.1
PS	3	6.3

About 53.19% of the study population belonged to NYHA classification grade 1 followed by 29.76%,12.76% and 4.2% in grade 2,3 and 4 respectively as in Table 5

**Table 5:Distribution as per functional grading(NYHA)**

Grading	number	Percentage
Grade 1	25	53.19
Grade 2	14	29.78
Grade 3	6	12.76
Grade 4	2	4.2

The various complications found in these patients were given in table 6.congestive cardiac failure was found in 6 patients antenatally and respiratory infections affected 7 patients.

**Table 6: cardiac and other complications observed**

complication	Antepartum	Intrapartum	Postpartum
Congestive cardiac failure	6	-	-
Acute pulmonary edema	2	-	-
Sub acute bacterial endocarditis	-	-	-

Respiratory tract infections	7	-	1
Anemia	1	-	-
Preterm labour	13	-	-
IUGR	4	-	-
HBSAg positive	3	-	-
Seizure	3	-	-
Bronchial asthma	2	-	-
PIH	2	-	-
GDM	1	-	-
Hypothyroid	1	-	-

Around 13 patients delivered preterm babies. About 13 babies were low birth weight as in Table 7and there was 2 neonatal deaths due to prematurity and very low birth weight(table 8).

**Table 7: Distribution as per birth weight of babies**

Birth weight	number	Percentage
>2.5 kg	34	72.34
1.5-2.5 kg	9	19.14
<1.5 kg	4	8.5

**Table 8: neonatal deaths in heart disease mothers**

Birth weight	maturity	Cause of death
1.3 kg	Prematurity	Respiratory distress,VLBW
1.1 kg	Prematurity	Respiratory distress,VLBW

**DISCUSSION**

The number of women with heart disease, who reach childbearing age in a good functional state has increased due to the improved facilities for diagnosis and treatment. As a result, pregnancy becomes a realistic option for many of these young women.<sup>6,7</sup>

There were total 2381 confinements during the year 2015, out of which 47 were heart disease cases. Thus, the incidence of heart disease in pregnancy in our study is 1.97 %.Most of the patients (83%) belonged to rural population.

The commonest age group to which the patient belonged to was 20-25 years. This is similar to the study conducted by kiran pande and kavita varma et al in which majority of the patients were 23-27 yrs of age group<sup>8,9,10</sup>

The majority of the patients(42%) were primigravidae and 40 % were second gravida. But in Hirallal konar et al 2012 jun study, majority were second gravida.<sup>11</sup>

Rhematic heart lesions constituted 76.6% and congenital heart disease accounts to 23.4%.this is similar to the study conducted by Abdel-hady es and El shamy, M et ai on 2005 july at Egypt and Hirallal konar et al 2012 jun in india.<sup>12,13,14</sup>

most of them 76.6% were delivered by LSCS for various obstetric and medical reasons followed by labour natural 19.14% and prophylactic forceps 4.2%. The incidence of RHD is higher, as most of the patients belonged to low socioeconomic class where poverty, poor nutrition, low level of sanitation and hygiene and inaccessibility to health services are common.

Mitral stenosis is the commonest heart lesion (23.4%)<sup>15,16</sup> followed by mitral valve prolapsed with trivial MR being the next most common (17.02%) and Post ASD closure constituted 12.76% of the cases 53.19% cases belong to Grade I functional heart disease and 29.76% of the cases belong to Grade II heart disease. It is also similar to Hirallal konar et al 2012 jun study.

congestive cardiac failure was found in 6 patients antenatally and respiratory infections affected 7 patients. There was one maternal death due to eisenmingers syndrome. Around 13 patients delivered preterm babies.

There was 2 neonatal deaths due to prematurity and very low birth weight. Accurate assessment of the individual maternal and foetal risk in pregnant women with heart disease is of fundamental importance for optimal patient care.<sup>17,18</sup> Prompt treatment of streptococcal infections can reduce the incidence of rheumatic heart disease and thereby maternal mortality and morbidity due to heart diseases. Proper prenatal counselling regarding risks due to heart disease on maternal health and regarding family planning can reduce the number of conceptions among these women helping to improve health status of these women.

## CONCLUSION

Heart disease complicating pregnancy is a high risk situation and demands special attention throughout pregnancy. An expert supervision and management by the obstetrician along with physician and the fullest co-operation by the patient throughout antenatal, intranatal and post-natal period, results in achieving the optimum maternal and perinatal outcome. It is essential to educate the rural population about the importance of regular antenatal visits and institutional delivery. Establishing the facilities for cardiac surgery at affordable cost in rural area will certainly go a long way in decreasing the mortality, morbidity related to heart disease complicating pregnancy.

## REFERENCES

1. Arafeh J.M., Baird S.M. Cardiac disease in pregnancy. *Crit Care Nurs Q* 2006;29:32-52.
2. Dobbenga-Rhodes Y.A., Prive A.M. Assessment and evaluation of the woman with cardiac disease during pregnancy. *J Perinat Neonatal Nurs* 2006;20:295-302.
3. Stangl V., Baumann G., Stangl K. Pregnancy risks in acquired heart diseases. *Z Kardiol* 2001;90:16-29.
4. Avila W.S., Rossi E.G., Ramires J.A., et al. Pregnancy in patients with heart disease: experience with 1000 cases. *Clin Cardiol* 2003;26:135-142.
5. Siu S.C., Sermer M., Harrison D.A., et al. Risk and predictors for pregnancy-related complications in women with heart disease. *Circulation* 1997;96:2789-2794.
6. Siu S.C., Sermer M., Colman J.M., et al. Prospective multicenter study of pregnancy outcomes in women with heart disease.
7. Siu S.C., Colman J.M., Sorensen S., et al. Adverse neonatal and cardiac outcomes are more common in pregnant women with cardiac disease.
8. Abdel-Hady E.S., El-Shamy M., El-Rifai A.A., et al. Maternal and perinatal outcome of pregnancies complicated by cardiac disease. *Int J Gynaecol Obstet* 2005.
9. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ, Spong CY, editors. *Cardiovascular Disease In Williams Obstetrics*. 24th edition. McGraw Hill Education; New York; 2010.
10. James, Steer, Weiner, Goink, Crowther, Robson. High risk pregnancy management option. In *Cardiac disease in pregnancy*. 4th edition: 2012:627-656.
11. Bhatla, Yadav, Mishra. The cardiac case. In *Ian Donald's practical obstetrics problems*. 6th edition. BI Publications Pvt Ltd. India. 2010;103-126.
12. Davies GA, Herbert WN. Assessment and management of cardiac disease in pregnancy. *J Obstet Gynaecol*. 2007;29(4):331-6.
13. Burlingame J, Horiuchi B, Ohana P, Onaka A, Sauvage L.M. The contribution of heart disease to pregnancy-related mortality according to the pregnancy mortality surveillance system. *J Perinatal*. 2012;32:163-9.
14. Surge D, Blake S, Donald D. Pregnancy complicated by maternal heart disease at the National Maternity Hospital, Dublin 1969-1978. *Am J Obst Gynecol*. 1981;139(1):1-6.
15. Barbosa PJ, Lopes AA, Feitosa GS. Prognostic factors of rheumatic mitral stenosis during pregnancy and puerperium. *Arq Bras Cardiol*. 2000;75:215-24.
16. Sawhney H, Aggarwal N, Suri V, Vasishtha K, Sharma Y, Grover A. Maternal and perinatal outcome in rheumatic heart disease. *Int J Gynaecology Obstet*. 2003;80:9-14.
17. Sheela CN, Karanth S, Patil CB. Maternal cardiac complications in women with cardiac disease in pregnancy. *Int J Pharma Biomed Res*. 2011;2(4):261-5.
18. Koregeol M, Nina, Nayak R, Amritha. Maternal and perinatal outcomes of pregnancies complicated by cardiac disease. *J Turkish German Gynaecol Assoc*. 2009;10:30-4.