

## A Prospective Study of Heart Disease in Pregnancy and Its Effect on Maternal Outcome

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### Abstract:

**Introduction:** Prevalence of heart disease in pregnancy varies from 0.3-3.5%.<sup>1,2</sup> Incidence of cardiac disease complicating 1 to 4% of pregnancies in India. In developing countries like India, Rheumatic heart disease is still predominate and comprises 89% of cases.<sup>4</sup> Which is because poor sanitary condition, resulting in repeated childhood streptococcal infection in rural areas. In India, the rheumatic heart disease contributes to approximately 69% of cardiac disorders seen in pregnancy.

**Materials and Methods:** This study was conducted in the Department of Obstetrics and Gynecology at Government Medical College & Hospital, Ananthapur. 110 women with heart disease which were previously established or diagnosed during pregnancy were enrolled in the study. Included in our study were all pregnant women with congenital or acquired cardiac lesions or delivered patients with heart disease who were referred to our hospital but those with associated medical disorders like Diabetes mellitus, pulmonary disease, renal disease or any other endocrinological disease were excluded from this study. A structured detailed proforma was used to gather the essential information regarding heart disease in pregnancy. Baseline data recorded included were age, parity, gestational age, cardiac lesions, use of cardiac medications, thorough clinical examination including chest and cardiovascular auscultation, ECG and echocardiographic assessment of left and right ventricular systolic function. The mode of delivery whether vaginal, use of instruments and the need for LSCS was duly recorded.

**Results:** A total of 110 women where pregnancy was complicated by heart disease were included in the study. The prevalence of heart disease amongst all pregnancies found in the hospital was 4.3%, The age of patients ranged from 20-35 years with maximum number of patients in 20-30 years age group (65.45%). In this study, most of the patients were primigravida (60%). The Rheumatic Heart disease was the principal cause of heart disease amongst all pregnancies. Congenital heart disease was present in 13.63% patients.

**Conclusion:** Present data supports the fact that the prognosis of pregnant women with heart disease has improved, leading frequently to successful outcome. This study concluded that pre- pregnancy diagnosis, counseling, appropriate referral, routine antenatal supervision and delivery at an equipped centre improve the pregnancy with heart disease outcome for both mother and baby. Cardiac failure is a serious complication and often leads to maternal death. We therefore stress the need to monitor cardiac patient for early detection and management of heart failure throughout the course of pregnancy, labor and puerperium.

**Key Words:** Heart disease, pregnant women, Diabetes mellitus, pulmonary disease, renal disease

Date of Submission: 14-08-2019

Date of Acceptance: 29-08-2019

### I. Introduction

Heart diseases in pregnant women and has higher incidence of maternal mortality and morbidity and is regarded as risk factor for unfavourable outcome of pregnancy both for the mother and the foetus.

Prevalence of heart disease in pregnancy varies from 0.3-3.5%.<sup>1,2</sup> Incidence of cardiac disease complicating 1 to 4% of pregnancies in India.<sup>3</sup> In developing countries like India, Rheumatic heart disease is still predominate and comprises 89% of cases.<sup>4</sup> Which is because poor sanitary condition, resulting in repeated childhood streptococcal infection in rural areas. In India, the rheumatic heart disease contributes to approximately 69% of cardiac disorders seen in pregnancy.<sup>1</sup>

The maternal mortality rate in women with cardiac disease is as high as 7%, and morbidity rate higher than 30% during pregnancy. Heart disease in pregnancy was found to be second indirect cause contributing to maternal mortality in India.<sup>7</sup> Maternal functional status is a most important predictor of outcome and most often defined by NYHA functional class. Poor functional status and cyanosis are mostly associated with adverse maternal and neonatal outcome.<sup>2</sup>

There are few studies available in India that are prospective, focused particularly on heart disease in pregnancy, and examined the populations managed at different institutions in different parts of country. Pregnancy related complications that compound the heart disease is ignored in the rural setup and patients rarely seek proper early care.<sup>3</sup>

With pregnancy-induced anatomical and functional changes in cardiac physiology can have a profound effect on underlying heart disease. In the presence of maternal heart disease, the cardiovascular changes of pregnancy may result in decompensation and even demise of the mother or fetus. Cardiovascular decompensation during labor may manifest as pulmonary edema with hypoxia or as hypotension, or both.<sup>4</sup>

This prospective study has been conducted in department of obstetrics and gynaecology, Govt Medical College & Hospital to evaluate effect of heart disease on pregnancy and feto-maternal outcome. The results can also be useful to increase awareness in patients regarding heart disease and other medical disorders during routine antenatal care.

## II. Materials And Methods

This study was conducted in the Department of Obstetrics and Gynecology at Government Medical College & Hospital, Ananthapur. 110 women with heart disease which were previously established or diagnosed during pregnancy were enrolled in the study. Included in our study were all pregnant women with congenital or acquired cardiac lesions or delivered patients with heart disease who were referred to our hospital but those with associated medical disorders like Diabetes mellitus, pulmonary disease, renal disease or any other endocrinological disease were excluded from this study. A structured detailed proforma was used to gather the essential information regarding heart disease in pregnancy. Baseline data recorded included were age, parity, gestational age, cardiac lesions, use of cardiac medications, thorough clinical examination including chest and cardiovascular auscultation, ECG and echocardiographic assessment of left and right ventricular systolic function. The mode of delivery whether vaginal, use of instruments and the need for LSCS was duly recorded.

### *Inclusion criteria*

- All obstetric patients admitted with heart disease and diagnosed after admission in study centre during study period were included in this study.

### *Exclusion criteria*

- Patients other than heart disease.

## III. Results

A total of 110 women where pregnancy was complicated by heart disease were included in the study. The prevalence of heart disease amongst all pregnancies found in the hospital was 4.3%, The age of patients ranged from 20-35 years with maximum number of patients in 20-30 years age group (65.45%). In this study, most of the patients were primigravida (60%). The Rheumatic Heart disease was the principal cause of heart disease amongst all pregnancies. Congenital heart disease was present in 13.63% patients.

| Age          | No         | Percentage |
|--------------|------------|------------|
| <20          | 6          | 5.45       |
| 20-25        | 42         | 38.18      |
| 26-30        | 30         | 27.27      |
| 31-35        | 13         | 11.81      |
| >35          | 9          | 8.18       |
| <b>Total</b> | <b>110</b> | <b>100</b> |

**Table 1: Age distribution of patients**

| Cardiac lesions               | No         | %            |
|-------------------------------|------------|--------------|
| Rheumatic heart disease       |            |              |
| <b>Single valve lesion</b>    | <b>34</b>  | <b>30.90</b> |
| <b>Multiple valve lesions</b> | <b>26</b>  | <b>23.63</b> |
| Congenital                    | <b>15</b>  | <b>13.63</b> |
| Prior cardiac surgery         | <b>13</b>  | <b>11.81</b> |
| Miscellaneous                 | <b>22</b>  | <b>20</b>    |
| <b>Total</b>                  | <b>110</b> | <b>100</b>   |

**Table 2: Distribution of cardiac lesion**

Among the women who had Rheumatic heart disease, Mitral Valve stenosis being the most common lesion and was seen in 21 (23.3%). Multiple cardiac lesions were present in 26 (23.63%) women. Among the

women with congenital cardiac disease, mitral valve prolapse was most common lesion constituting 5 (5%) cases.

| Pregnancy                | No                                      | %            |
|--------------------------|---|--------------|
| LSCS                     | 35                                      | 31.81        |
| Vaginal delivery         | <b>Spontaneous labour</b>               | <b>33.63</b> |
|                          | <b>Induced Labour</b>                   | <b>6</b>     |
| Instrumental delivery    | <b>Ventouse</b>                         | <b>5</b>     |
|                          | <b>Outlet forceps</b>                   | <b>2</b>     |
| Termination of pregnancy | <b>Inevitable Abortion</b>              | <b>7</b>     |
|                          | <b>Medical termination of pregnancy</b> | <b>3</b>     |
| Maternal Death           | 5                                       | 4.54         |

**Table 3:** Maternal outcome of pregnancy in term of mode of delivery

Cardiomyopathy was the most common cardiac disease in the miscellaneous group, constituting 7 (7.8%). Among the studied pregnant women with heart disease, heart failure developed in 10 (11.1%) cases whose NYHA class changed from class I/II to class III/IV. Majority of women delivered by cesarean section 35 (31.81%). 37(33.63%) subjects had a normal vaginal delivery with spontaneous onset of labour. Seven (6.35%) had assisted instrumental vaginal delivery.

#### IV. Discussion

This study was conducted in the Department of Obstetrics and Gynaecology, Govt medical College & Hospital in total of 110 women. This study aimed at assessment of maternal complications associated with cardiac disease in pregnancy. Various studies estimated that 0.3% to 3.5% of all pregnancies are complicated by heart disease. In the present study, the prevalence of 4.3% was found which was same as that of the study conducted by Puri S et al.<sup>20</sup> In the current study, majority of the patients were in the age group of 20-30 years (74.5%) and most of them were either primigravidae or primipara (60%). This was comparable to Vidyadharet al were 70% were either primigravida or primipara.<sup>5</sup>

In the current study RHD (56.6%) was the principal cardiac lesion and mitral stenosis was the most common cardiac lesion (23.3%). These results were in consensus with Vidyadharet al, Mazhar SB et al, Devabhaktula et al, and N Bhatla et al. However incidence of RHD has been greatly reduced in developed countries by widespread use of antibiotics effective against the streptococcal infections. Thus, current study indirectly indicates inadequate treatment of streptococcal infections in childhood and adolescence. Echocardiography was done routinely in our patients. Twenty-two (24.4%) patients had multiple cardiac lesions. Echocardiography was helpful for early and accurate evaluation of cardiac lesions.<sup>6</sup>

In this study, 35.6% women had spontaneous vaginal delivery as compared to 41% (Nilajkumar et al); 24% (Alireza et al)<sup>7</sup>; 76.2% (Mazhar et al)<sup>8</sup>; 73.5% (Hameed et al)<sup>9</sup>; 62.8% (Vidyadhar et al)<sup>10</sup> in other studies. Cesarean Section (36.7%) was done only for obstetrical indications. Nilajkumar et al reported caesarean in 20.6%; 9.5% by Mazhar et al; Alireza et al (76%). In the present study, 55 of women underwent labour induction as compared to 15% in study conducted by Hameed et al and Pratibha D et al. In the evaluation of pregnancy with cardiac disease 7.8% of patients had inevitable abortions and 2.2% had to undergone MTP which was comparable to Suman et al and Mazhar et al studies. Mortality in pregnant females with cardiac disease is mainly due to cardiac failure and pulmonary oedema. Four females in our study died mainly due to cardiac failure, sepsis and shock which was comparable to Hameed et al, Mazhar et al, Alireza et al, Verena et al, Akhtar et al and Sheetal CN et al.<sup>11</sup>

#### V. Conclusion

Present data supports the fact that the prognosis of pregnant women with heart disease has improved, leading frequently to successful outcome. 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. This study concluded that pre-pregnancy diagnosis, counseling, appropriate referral, routine antenatal supervision and delivery at an equipped centre improve the pregnancy with heart disease outcome for both mother and baby. Cardiac failure is a serious complication and often leads to maternal death. We therefore stress the need to monitor cardiac patient for early detection and management of heart failure throughout the course of pregnancy, labor and puerperium.

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Dr.Bandi Parvathi. “A Prospective Study of Heart Disease in Pregnancy and Its Effect on Maternal Outcome.” *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 8, 2019, pp 40-43.