

A Study of Pregnant Women with Cardiac Disease

Dr Jigar Kanubhai Thakkar, Dr Pushpa A Yadav, Dr Rupa C Vyas

Abstract:

Objective: To analyse the pregnant women with heart disease and to assess its influence on the fetomaternal outcome.

Materials and methods: This observational study was carried out during the period from July 2014 to October 2015. Twenty five pregnant women with cardiac diseases who were admitted in the department of Obstetrics & Gynaecology in Tertiary care centre were included in the study.

Results: Rheumatic heart disease (n-18, 72%) with mitral stenosis (60%) was the predominant cardiac problem among the study subjects while atrial septal defect (8%) was the most common form of congenital heart disease (n-4, 16%), 3 patients developed peripartum cardiomyopathy (12%). Based on New York Heart Association (NYHA) functional classification, 4(16%) women were in class-I, 20(80%) were in class-II and 1(4%) were in class-III heart disease on presentation. The rate of cesarean section (60%) was high in the study subjects. The rate of prematurity was high among class II and III. Out of twenty five, five patients developed heart failure during the hospital stay. One patient of the study subjects expired.

Key words: Rheumatic heart disease, mitral stenosis, ASD.

I. Introduction

Pregnancy causes dramatic, usually reversible change in a woman's cardiovascular system. Cardiovascular disease is the most important non-obstetric cause of disability and death in pregnant woman occurring in 0.4 to 4.0 percent pregnancies.¹ It is not surprising that added haemodynamic burden of pregnancy, labour and delivery can aggravate symptoms and precipitate complications in a woman with pre-existing cardiac disease.

Heart disease can be classified as congenital or acquired. Acquired diseases can be infectious, autoimmune, degenerative and idiopathic.¹ Heart disease has a significant impact on fetal and maternal health during pregnancy, labor and delivery.²

The commonest cardiac lesion during pregnancy in Indian setup is of rheumatic origin followed by congenital one.³ The most dominant rheumatic lesions have been mitral stenosis (80%), followed by aortic stenosis (10%), mitral regurgitation (6.6%) and aortic regurgitation (2.5%).² The advancement in surgical techniques & minimal invasive surgeries has improved the prognosis of congenital lesions and many women even with severe defects are now reaching the child bearing age.

Valvular and congenital heart disease had an effect on fetal outcome resulting in an increased preterm delivery, intrauterine growth retardation and low birth weight.

The purpose of this study was to analyse the pregnant women with heart disease and thereby to assess the influence of cardiac disease on pregnancy and delivery in terms of maternal and fetal outcome.

II. Materials and Methods

This Observational study was carried out from July 2014 to October 2015 in the department of Obstetrics & Gynaecology in a Tertiary care centre. Twenty five patients with heart diseases either booked or nonbooked cases, who were in their third trimester were selected in this study and followed up upto their delivery. The booked cases were seen by obstetrician in the fetomaternal medicine out patient department (OPD) and by cardiologist in the respective OPD to check for their cardiac status. The non-booked cases were referred from different hospitals or clinics or other obstetricians when some critical conditions developed.

After admission, Grading of the heart disease was done according to the criteria of New York Heart Association (NYHA) functional classification. For the confirmation of diagnosis and also for the management purpose, patients were evaluated by both cardiologists and obstetricians regularly and investigations including ECG and Echocardiography were done in all cases. Gestational age of the women were calculated from the last menstrual period, clinical examination and ultrasonography report. The mode of delivery was decided on the basis of the condition of the mother as well as fetal condition. In most of the cases, the mode of delivery was elective caesarean section and the patients were evaluated by both cardiologist and anaesthesiologist during the pre, post and intraoperative management. Immediately after delivery APGAR score and birth weight of the babies were noted. All the neonates were seen by neonatologists to exclude any congenital heart defects specially in women with congenital heart disease. All the information was gathered in a prepared data sheet.

III. Results

Table-I Type of heart disease (n=25)

Diagnosis	Number of patients	Percentage
Rheumatic Heart Disease	18	72
Congenital Heart Disease	4	16
Peripartum Cardiomyopathy	3	12

Table-II History of cardiac surgery prior to pregnancy (n=25)

History of cardiac surgery	Number of patients	Percentage
Present	7	28
Absent	18	72

Table- III Distribution of the patients (n= 25) and maternal & fetal outcome according to NYHA class on Presentation

NYHA class	No of patients	Percentage	Term labor (n = 18) No. (%)	Preterm labor (n = 7) No. (%)	Heart failure (n-5) No. (%)	Mortality (n = 1) No. (%)
Class I	4	16	04 (100)	0 (00)	00 (00)	00 (00)
Class II	20	80	12 (60)	8 (40)	04 (20)	00 (00)
Class III	1	4	0 (0)	01 (100)	01 (100)	01 (100)
Class IV	0	0	0(0)	0(0)	00 (00)	00 (00)

Table-IV Mode of Delivery (n =25)

Type of delivery	No of patients	Percentage
Normal vaginal delivery	10	40
LSCS	15	60

IV. Discussion

Cardiac disease in pregnancy is a cause for concern and is an important recognized cause of maternal death^{4,5} In western countries, a progressive decline has been noticed in the incidence of rheumatic heart disease. However, such a trend has not been noticed in our country.

During the study period (July 2014 to October 2015), twenty five patients with heart diseases were admitted in the obs and gynec department of Tertiary care centre. Among them, 18 (72%) patients had rheumatic heart disease and in the rheumatic heart disease group, mitral stenosis was the most common lesion (60%). Out of the rest, 4 (16%) had congenital lesions, of which atrial septal defect was the most common form (8%) and 3(12%) patients developed peripartum cardiomyopathy. (Table- I) A study by Karaalp *et al.*⁶ also showed that majority of the patients with heart disease in pregnancy had rheumatic heart disease (70%) and most of the rheumatic heart lesions were mitral stenosis. In the study congenital lesion was 30 percent, and atrial septal defect was the most common congenital valvular disease. The findings are similar to this study.

In this series, out of 25 patients, 7 (28%) had their lesions surgically corrected before they became pregnant (4 patients with rheumatic heart disease & 3 with congenital lesions). (Table-II). A study done by Hsich *et al.*⁹ showed that 27 percent patients had surgically corrected lesions. Another study done by Sawhney *et al.*⁷ showed 38.6% patient had undergone surgical correction prior to pregnancy.

Regarding classification of heart disease, four (16%) women belonged to class I, twenty (80%) women belonged to class II and one (4%) women belonged to class III heart disease according to NYHA classification. None of the patients belonged to class IV on admission(Table- III). In a study by Sawhney *et al.*⁷ found 95.4 percent in class I and II and 4.8 percent in class III.

Regarding fetal outcome, the rate of prematurity were high among class II and class III while in case of class I, all four patients delivered at term. Incidence of IUGR was high among cardiac patients (7 out of 25 patients). Live birth rate was 100%.(Table- III) A study done by Sawhney *et al.*¹⁰ showed that livebirth were 252 out of 254 patients, and 2 were stillbirths.

Regarding maternal outcome, 5 women developed heart failure. Among them 4 patients are of class II and 1 patient is of class III. One patient of the study group expired on 8th postpartum day due to heart failure.(Table- III) A study done by Hameed *et al.*¹² showed similar results.

Table-IV shows that out of 25 patients, only 10(40%) women had normal vaginal delivery while 15 (60%) women went through LSCS. Indications for caesarean section were fetal distress (4%), previous cesarean section (16%), malpresentation (8%), non-progression of labor (4%) and IUGR (28%). A study done by Hameed *et al.*¹² showed mode of delivery was vaginal in 61 (92%) out of 66 patients with valvular heart disease and others had caesarean section due to obstetric indications and cardiac lesions. Another study done by Bonow

*et al.*¹¹ showed mode of delivery was vaginal in 196 (78.1%) out of 251 and cesarean section done on 55 (21.9%) patients. The rate of cesarean delivery was higher in this study compared to others studies. This high rate of cesarean delivery was due to perceived cardiovascular risk for the mother during pregnancy.

Heart disease with pregnancy is a very high risk condition and is associated with considerable morbidity and mortality ratio. The management of these cases should be multidisciplinary to optimize care for these patients throughout pregnancy and in the puerperium and early risk stratification should be done to improve the prognosis of pregnancy in women with heart disease.

References

- [1] Grewal M., Biswas MK., perloff D. Cardiac, Hematologic, Palmonary, Renal and Urinary Tract disorder in Pregnancy, in Decherney AH. And Nathan (Eds), Current Obstetrics & Gynaecologic Diagnosis and Treatment, 9th Edition, 1991; 387 – 427.
- [2] Dutta DC. Heart Disease in Pregnancy in Konar H (Eds), Text book of obstetrics, 4th Edition, 1998; 293-298.
- [3] Siu SC, Cofman JM. Heart disease and pregnancy. *Cardio Clin* 1998; 573:95.
- [4] Carnetti M, Elkayam U. The effect of valvular heart disease on maternal and fetal outcome of pregnancy. *U Am Coll Cardiol* 2001; 37:893-9.
- [5] Department of Health and Social Security. Report on confidential enquiry into maternal death in England and Wales, 1979-1981. London: Her Majesty's Stationary Office, 1986.
- [6] Karaalp S. Effect of valvular heart disease on maternal and foetal outcome in pregnancy. *J Am Coll Cardiol* 2001; 37:893-8.
- [7] Sawhney H, Suri V, Vasishtha K, Gupta N, Devi K, Grover A. Pregnancy and congenital heart disease: maternal and foetal outcome. *Aust NJ Obstet Gynaecol* 1998; 38:266.
- [8] McFaul PB, Doman JC, Lamki H, Boyle D. Pregnancy complicated by maternal heart disease: a review of 526 women. *J Obstet Gynecol* 2001; 26:350.
- [9] Hsich TT, Chen KC, Soong JH. Outcome of pregnancy in patients with organic heart disease in Taiwan. *Asia-Oceania J Obstet Gynaecol* 1993; 19:21-7.
- [10] Sawhney H, Aggarwal N, Sury V, Vasishtha K, Sharma Y, Grover A. Maternal and perinatal outcome in rheumatic heart disease. *Int J Gynaecol Obstet* 2003 Jan;80(1):9-14.
- [11] Bonow RO, Carabello B. ACC/AHA guidelines for the management of pregnant women with mitral stenosis. *Am J Obstet Gynecol* 1990;163:37- 40.
- [12] Hameed A, Al Kasab SM, Sabag T, Al Zaibag M. Management of pregnant women with mitral stenosis during pregnancy and puerperium. *Arq Bras Cardiol* 1992; 58:359-64.
- [13] Adam AA. Pregnancy and heart disease. *Monthly Bulletin, Cardiovascular Institute of South University*, May, 2003.
- [14] Chin P, Raman S, Tham SW, The pregnancy outcome of valvular heart disease. *J Obstet Gynaecol Res* 1998; 24:267-73.
- [15] Oakley CM. Cardiovascular disease in pregnancy. *Can J Cardiol* 1990; 6(Suppl 1B): 3B.