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Original Article

Maternal and fetal outcome in operated vs non-operated cases of congenital heart disease cases in pregnancy

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ABSTRACT

Objectives: To study pregnancy outcome in operated vs non-operated cases of congenital heart disease cases during pregnancy.

Materials and methods: A total of 55 patients of congenital heart disease who delivered in the authors unit in last 10 years were taken in this retrospective study. These were divided into two groups Group 1: 29 (52.7%) patient who had no cardiac surgery and Group 2: 26 (47.2%) who had cardiac surgery to correct their cardiac defect before pregnancy. All patients were evaluated for cardiac complications and fate during pregnancy. Obstetric complications, mode of delivery and fetal outcome was compared in the two groups using statistical analysis.

Result: The commonest lesion was atrial septal defect (ASD) seen in 22 (40%) patients followed by ventricular septal defect (VSD) in 16 (29%). Congenital valvular disease 8 (14.5%) and patent ductus arteriosus in 4 (7.2%) cases. The mean age was 25.9 ± 3.15 years in Group 1 and 26.3 ± 4.53 years in Group 2. The baseline characteristics were similar in the two groups. There was no difference in cardiac complications, NYHA deterioration and need of cardiac drugs in the two groups. Obstetric complications and mode of delivery were also similar in the two groups. Mean birth weight was 2516.65 ± 514.04 gm in Group 1 and 2683.00 ± 366.00 gm in Group 2 and was similar. APGAR < 8, stillbirth rate and other neonatal complications were also similar in two groups.

Conclusion: The maternal and fetal outcome was excellent in patients with congenital heart disease and was similar in unoperated and operated cases.

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1. Introduction

Advancements in diagnosis and important improvement in cardiac surgery for congenital heart disease with better outcome has radically changed the prognosis of congenital heart disease especially in complex lesions.^{1,2} Hence more and more women of congenital heart disease are surviving to adulthood and getting married and are likely to have the complications in pregnancy.^{1,2} Pregnancy is associated with severe hemodynamic changes like increasing blood volume, redistribution of regional blood flow and increased oxygen consumption which are well tolerated by normal women and many women with cardiac disease but it can be challenging for some cardiac patients especially with severe and complex disease.^{1,3,4}

The prevalence of Rheumatic heart disease (RHD) has decreased dramatically in western countries where congenital heart disease is leading cardiac disease during pregnancy.^{1,5,6} On the other hand, in the developing countries like India, RHD remains the commonest cardiac disease during pregnancy, mitral stenosis being the commonest lesion.^{7,8} However even in developing countries, more patients of congenital heart disease are presenting for antenatal care especially in tertiary referral centre with facilities for cardiology and cardiac surgery. Congenital heart disease especially complex lesion is a high risk situation, prone to complications during pregnancy, labor, puerperium and is an important cause of maternal and perinatal morbidity and mortality.^{6,9–15} Heart failure, arrhythmias, and bleeding complications due to anticoagulants can occur in these patients during pregnancy.¹⁴ Even pharmacotherapy needed to stabilize maternal condition may cause problems for mother and fetus. Risk factors and predictor of complication in pregnancy have been elucidated for congenital and acquired heart disease by Siu et al.^{16,17} It is presumed that cardiac surgery before

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pregnancy in congenital heart disease may have better pregnancy outcome especially for severe and complex lesions. We report result of pregnancy outcome of congenital heart disease patients who were either operated before pregnancy or were non operated cases.

2. Materials and methods

A total of 55 cases of congenital heart disease who delivered in obstetric unit of a tertiary centre unit in last 10 years from Jan 1997 to Dec 2016 were enrolled in this retrospective study. Another 191 women with normal pregnancy without heart disease or other medical problem who delivered in our hospital at the same time were taken as control for obstetric and perinatal outcome. Women with rheumatic heart disease, cardiomyopathies and Eisenmengers syndrome and other non-congenital heart disease were excluded from the study. The type of congenital heart disease was noted in all cases. The cases were divided in 2 groups, Group 1:29 (52.78%) cases who had no cardiac surgery and Group 2:26 (47.2%) cases who had cardiac surgery for the congenital heart disease prior to pregnancy. The baseline characteristics like range and means of age, obstetric history (primigravida, multigravida and previous abortions), time since diagnosis from pregnancy, New York Heart Association (NYHA) classification and any associated medical problems like anemia, hypertension, intrahepatic cholestasis etc were noted in all the patients. The cardiac complications and need of cardiac medication in the two groups were noted. The incidence of arrhythmias, any deterioration of NYHA classification during pregnancy was noted. Use of cardiac medications like digoxin, diuretics, beta blockers and anticoagulants was noted in all patients.

Various obstetric complications (anemia, preterm labor, ante-partum hemorrhage, oligoamnios, ICP) and mode of delivery was noted in the two groups. The mode of delivery (vaginal or caesarean), instrumental delivery was noted in all patients.

Fetal outcome was noted in the two groups. The mean birth weight, fetal growth restriction, APGAR <8, any still birth or neonatal death, any congenital anomaly and any neonatal complications were noted in all the patients.

3. Statistical analysis

Data analysis was carried out using statistical software STATA version 12.0. Continuous variables were tested for normality assumptions using appropriate statistical tests. For the variables that were approximately to normal distribution descriptive

statistics such as mean, standard deviation and the range values were calculated. For non-normal data median values were compared. Comparison of two group means were tested using student –t independent test. Categorical variables were expressed in terms of frequency and percent values. Frequency data by categories was compared using chi square test/Fischer exact test as appropriate. Two sided probabilities $P < 0.05$ was considered for statistical significance.

4. Results

There were 55 total case of congenital heart disease who delivered during last 10 years in the authors unit. There were 29 (52.7%) non-operated cases (group 1) and 26(47.3%) operated cases before pregnancy (Group 2). The type of congenital heart disease is shown in Table 1. Atrial septal defect (ASD) was the commonest lesion seen in 22(40%) cases followed by ventricular septal defect (VSD) in 16(29%) cases, congenital valvular disease in 8(14.5%) cases, patent ductus arteriosus in 4(7.2%) cases. Other congenital disease were coarctation of aorta in 2(3.6%), tetralogy of fallot in 2 (3.6%), bicuspid aortic valve in 1(1.88%), congenital heart block in 1 (1.88%), sick sinus in 2(3.8%).

The baseline characteristics in the two groups are shown in Table 2. The mean age was 25.9 ± 3.85 years in group 1 and 26.3 ± 4.53 years in group 2 and was similar ($p < 0.05$). There were 13(58.62%) primigravida in group 1 and 7(34.6%) in group 2 ($p > 0.05$). Previous abortions were also seen in equal number of cases in two groups (24.15% vs 23.07%; $P > 0.05$). Time since diagnosis from pregnancy was also similar in two groups being <10 years in 11(37.93%) in group 1 and 21(80.76%) in group 2. A total of 16(55.17%) patients in group 1 were in NYHA class 1 as compared to 20(76.92%) in group 2. In operated group (group 2) none of the patients was in severe NYHA class (NYHA class 3 and 4) as compared to 5(17.24%) in NYHA 3 and 1(3.4%) in NYHA 4 in group 1 (non operated group).

Thus all patients (26,100%) in operated group (Group 2) were in early NYHA class 1 and 2 as compared to 23(79.3%) in group 1 (non operated group). Thus severe disease NYHA 3 or 4 was seen in 6 (20.68%) in non operated (group 1) as compared to nil in group 2. Other associated problems seen were anemia, hyper or hypothyroidism, urinary tract infection, seizure disorder were similar in two groups.

Various cardiac complications and need of cardiac drugs in the two groups are shown in Table 3. Most cases were uneventful (75.8% vs 75.9%). Arrhythmia was seen in 5(17.2%) in group 1 and 5 (19.2%) cases in group 2 and was similar. Use of cardiac medication

Table 1
Types of cardiac lesion in two groups.

S.No	Cardiac Condition	Non Operated NO. (%) N = 29(52.7%)	Operated Before Pregnancy NO. (%) N = 26(47.3%)
1.	Congenital Heart Disease#:		
	ASD	12(41.3)	10(38.4)
	VSD	8(27.6)	8(30.8)
	TOF	1(3.4)	1(3.8)
	PDA	1(3.4)	3(11.5)
	COA	1(3.4)	1(3.8)
	Bicuspid Aortic Valve	0	1(3.8)
	Congenital Valvular Disease	5(17.2)	3(11.5)
	Congenital Heart Block	0	2(7.6)
	Sick Sinus	1(3.4)	0

ASD:Atrial septal defect.

VSD:Ventricular septal defect.

TOF:Tetrology of fallot.

PDA:Patent ductus arteriosus.

COA:Coarctation of aorta.

#: some patients had more than one cardiac lesion.

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