

Evaluation of Maternal and Foetal Outcome of Pregnancy with Heart Disease with Special Reference to Surgically Corrected Heart Diseases

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Abstract- Objective: To study maternal and foetal outcome of pregnancy in women with heart disease with history of corrective surgery/ intervention

Methods: Pregnant women with cardiac disease attending antenatal clinic were studied over one year to assess their profiles and maternal and foetal outcome of pregnancy with women having corrective surgeries is evaluated.

Results: Majority of women belong to 20 to 24 year age group. Most of the patients were multigravida (55%). Incidence of heart disease is 0.9 %. Rheumatic heart diseases constitute 76.66 % of all cardiac disorders in patients delivering in our Hospital. Most common surgery observed is valve replacement (56%). There is improvement in maternal and foetal outcome with respect to antenatal complications, prematurity, APGAR score at 5 minute, low birth weight and mortality.

Conclusion: Surgical correction improves maternal and foetal outcome.

Index Terms- Cardiac surgery, pregnancy with heart disease

I. INTRODUCTION

Heart disease is one of the most important medical complication during pregnancy as it is one of the common, indirect obstetric cause of maternal death. Approximately 1% of pregnancies are complicated by cardiac disease¹ & management of these cases^{may} challenge the entire team providing care to the mother & fetus.

The advancement in cardiology & obstetrics has provided major improvements in the management of pregnant patients with cardiac disorders. In recent era, we are facing more patients with previous history of surgical correction of congenital or rheumatic heart disease. It mainly includes correction of ASD, valve replacement surgeries and balloon mitral valvuloplasty. Although rheumatic mitral stenosis was commonest cardiac lesion in past associated with maternal mortality, death rarely occurs today². Indications for surgery are same as in the non pregnant state, i.e. failure of medical therapy with intractable medical symptoms, history of pulmonary edema before pregnancy with risk of recurrence in pregnancy and profuse hemoptysis.

Objective: To study maternal and foetal outcome of pregnancy in women with heart disease with h/o corrective surgery / intervention.

II. MATERIAL AND METHODS

It was prospective study carried out from Sept. 2009 to Sept. 2010. Before conducting this study approval from institutional ethical committee was taken. The present study consists of cases with cardiac disease either congenital or acquired with history of corrective surgery in the past. It includes those patients attending ANC clinic in tertiary centre as well as those who presented directly in labour room on emergency day with history of corrective heart surgery.

After Careful history taking, patient was allocated to one of the functional class (NYHA) according to the severity of symptoms. Patients were monitored throughout the pregnancy for any deterioration or worsening of NYHA class.

After classifying patient in NYHA grade, the investigations such as 2D echo, chest x ray, ECG, hemogram were done. Patients with NYHA grade I & II were managed on outpatient basis with the advice to take adequate rest, dietary instruction, regular haematinics & penidura prophylaxis. Intrapartum details, postpartum complications & fetal outcome were recorded. Patients were studied on the basis of anticoagulation used, maternal outcome in view of thromboembolism, heart failure, death and perinatal outcome in view of embryopathy, abortion, stillbirths, IUGR, preterm delivery.

Associated maternal medical complications like anemia, infection, chronic hypertension and cardiac complication like CCF, respiratory infections, endocarditis, arrhythmias and obstetric complications like PROM, PIH, low lying placenta, preterm labour were evaluated.

Pregnancy is allowed to continue upto term and labour was awaited for spontaneous onset. Anticoagulants like heparin or warfarin continued throughout pregnancy. LSCS is only for obstetrics indications. All patients were given infective endocarditic prophylaxis. Inj. Furosemide 40 mg I.V. is given at the end of second stage. Routine use of Inj. Methylethergometrine was avoided. Concentrated oxytocin drip was used to prevent postpartum hemorrhage.

III. OBSERVATIONS AND RESULTS

Total no. of deliveries in study period are 6404. Sixty (0.9 %) patients had cardiac disease (congenital or acquired). There are total 25 patients with h/o corrective cardiac surgery. Out of 25 patients, 20 patients had rheumatic heart disease and 5

patients had congenital heart disease. Of these 60 women 25 (41.66 %), had undergone some form of cardiac intervention, 23 before and two during the current pregnancy.

Of all the types of heart lesions, RVHD with mitral stenosis was most common cardiac lesion present. Age of women varied from 19 to 34 years of age with most belonging to 20 to 24 year age group. Most of the patients were multigravida (55%) and majority of patients 29 (48.33%) were in NYHA class II and only 13 (21.66%) patients were in class III. No patient with class IV was detected.

There were certain antepartum complications associated, out of which infections anemia, atrial fibrillation and CCF were commonly present in non operated group while PROM is commonly present in operated patients.

The operations include valve replacement, Balloon mitral valvuloplasty, ASD repair and temporary pacemaker in patients with complete heart block. Most common surgical correction observed is valve replacement (56%) secondary to rheumatic valvular disease followed by valvuloplasty in 24 % of patients.

The mean birth weight in non operated group is 2.3 ± 0.43 kg while in operated patients mean birth weight is 1.9 ± 0.44 kg.

Mode of delivery in operated group is predominantly vaginal (92%), out of which 36 % were instrumental deliveries. In non operated patients most of them (79%) delivered by vaginal route, out of which 28.5% were instrumental deliveries. So incidence of

vaginal deliveries was higher in operated group. Incidence of LSCS were lower (8%) in surgically corrected patients, while it is almost 20% in non operated patients. P value is 0.28 (Fischer test) which is statistically not significant. All LSCS were done for obstetric indications.

Mean gestational age in non operated patients is 33 ± 3.44 wks while it is approx. 34.3 ± 4.49 wks in surgically corrected group. Mean Apgar score at 5 minute is 6.4 ± 1.9 in non corrected patients while it is 6 ± 2.4 in surgically corrected group. Regarding NICU admission, five (14.2%) babies went into NICU in non operated patients while only one baby in operated group went to NICU.

Drugs: Out of 14 patients of valve replacement, ten patients were taking anticoagulant i.e. T. Warfarin and INR was maintained between 2.5-3. All patients had metallic prosthetic valves. In patients on warfarin, mode of delivery: vaginal delivery in 6 patients, forceps application in 4 patients. Maternal outcome in operated patients – no patient had complications like thromboembolism, PPH, arrhythmia, infection, death. Neonatal outcome: Three stillbirths/IUD occurred in patients in taking warfarin while 2 in those not taking warfarin.

In post partum complications, one patient develops congestive cardiac failure which is treated promptly with digoxin and diuretics.

Table-1. Type of cardiac lesion

Type of Cardiac	No. of cases Operated(25)	No. of cases Not operated(35)
Congenital	5	9
Rheumatic (acquired)	20	26

Table- 2. Patients characteristics

		No. of cases operated (25)	No. of cases Not operated (35)	Total
Age group (in yrs)	<20	2	1	3 (5%)
	20 – 24	14	19	33(55%)
	25 – 29	8	12	20(33.3%)
	30 – 34	1	3	4(6.6%)
Parity	Primigravida	15	12	27(45%)
	Multigravida	10	23	33(55%)

NYHA functional class.	I	11	7	18(30%)
	II	12	17	29(48.33%)
	III	2	11	13(21.66%)

Table- 3: Type of surgical correction

Type of surgical correction		Cases (25)	%
Valve replacement	Single valve replacement	11	44
	Double valve replacement	3	12
Balloon mitral valvuloplasty		6	24
ASD repair		2	8
PDA ligation		1	4
Temporary pacemaker		2	8

Table 4: Antepartum complications.

Antepartum complications	No. of surgically corrected cases (25)	Non operated cases (35)
Anemia	0	5 (14.28%)
Infections	2	4 (11.42%)
PROM	3	7
PIH	3	1
Placenta praevia	1	1
Atrial Fibrillation	0	2

CCF	0	1
Hypothyroidism	0	1
Syncopal attacks	2	0

Table -5 Mode of Delivery (Classification based on surgical correction)

Mode of delivery		Pre-pregnancy Surgically Corrected		Non corrected heart disease		P Value (Fisher test)
		No. (25)	%	No. (35)	%	
Vaginal delivery	Preterm	5	20	8	22.8	0.4 Not statistically significant.
	Full term	9	36	10	28	
LSCS		2	8	7	20	
Forceps/Ventouse		9	36	10	28.5	

Table- 6: Perinatal outcome (Classification based on surgical correction)

Perinatal Outcome	Surgically Corrected		Non operated		P Value
	No. (25)	%	No. (35)	%	
Prematurity	10	40	18	51.42	0.43
Stillbirth/IUD	5	20	2	5.7	0.11
APGAR <5 at 5 minutes	3	12	9	25.7	0.32
Birth weight <2.5kg (full term)	8	32	24	68.5	0.008
NICU	1	4	5	14.2	0.38

Table- 7: Details of maternal death.

Age	parity	Heart disease	NYHA	LVEF	Surgical correction	Cause of death
34	G4P3L3	Severe MS + Severe MR + mild pulmonary	III	35%	uncorrected	Severe MS & Severe MR with congestive

		Hypertension				cardiac failure not in labour.
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IV. DISCUSSION

Pregnant women with associated cardiac disease represent a major challenge for obstetrician & cardiologist involved in their care. Careful clinical evaluation & judicious use of diagnostic tools (2 D echo) can result in better outcome³. In this study, 60 women were analyzed according to risk factors into antenatal, intrapartum & postpartum complications, and maternal and neonatal outcome compared with reference to surgical correction. Rheumatic heart diseases constitute 76.66% of all cardiac disorders in patients delivering in our Hospital. The rate of RVHD was falling slowly since last decade with incidence of 66-75 % due to better awareness of antenatal surveillance through media and availability of antibiotics⁴.

Most of the women in childbearing age who have cardiac surgery, suffer from rheumatic heart disease, and therefore mitral valve replacement are the commonest procedures carried out in them. The majority of women had surgery between 20 and 30 years of age.

Valve replacement was performed using mechanical prostheses which, as compared to bioprosthetic valves, have a lower risk of deterioration in function due to additional burden of pregnancy. Pregnancy being a hypercoagulable state has an increased risk of thromboembolism and thrombosis of prostheses, therefore anticoagulant therapy is indicated in these women^{5,6}.

Incidence of cardiac disease in pregnancy in our study is 0.9%. Rate of antepartum complications like anemia (14.2%), infections (11.42%), cardiac arrhythmias (5.7%), CCF (3%) were more in non operated group when compared to operated patients, suggests better antenatal, intrapartum and postpartum management and follow up.

Out of 7 stillbirths/IUD, five (20%) occurred in surgically corrected group while two (5.7%) in non corrected group with P value is 0.11 which is not statistically significant. Incidence of low birth weight in non operated group is more 24/35 (68.5%) while in operated group it is 8/25 (32%) with P value of 0.008 which is statistically significant.

Out of 60 patients, one patient succumbed and died due to CCF from non corrected group having NYHA class III dysnoea. There is no maternal mortality from surgically corrected group due to improved perinatal care. One maternal death (2.8%) is noted in non operated group of patients.

V. CONCLUSION

Heart disease is a genuine risk factor for mother and foetus. Recent advances in management of heart disease are associated with favorable maternal and foetal outcome and thus improving obstetric career of the patient. It is necessary to emphasize the need for an interdisciplinary approach between cardiologist and obstetrician for the adequate diagnosis of the disease, proper treatment including operative intervention where required, as it gives better outcome and reduces mortality⁷

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