



Feto-Maternal Outcome of pregnancies complicated by low and intermediate risk heart disease at a peripheral hospital : Experience from a single centre

KEYWORDS

Cardiac disease, Feto-maternal outcome, Peripheral hospital

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ABSTRACT *About 1% of pregnancies are complicated by cardiac disease making such patients high risk, and leading to increased morbidity and mortality. With proper work up, risk stratification and regular follow up, it may be possible to manage these pregnancies at a peripheral hospital with help of a physician. Present study is a cross sectional observational study of pregnancies complicated by low and intermediate risk heart disease managed at peripheral hospital along with feto-maternal outcome. The results showed that 80% of pregnancies with heart diseases could be managed at peripheral set up. Maternal complications were noted in 17.94% patients with no maternal mortality. Neonatal complications were seen in 33.33% neonates and one patient had a still birth. These findings suggest that most of the pregnancies complicated by low to intermediate risk heart disease can be successfully managed in a peripheral hospital. Careful selection of the patients, risk stratification and timely referral are important in reducing maternal mortality and improving fetal outcome.*

Introduction

It is seen that cardiac disease complicates around 1% of pregnancies. Pregnancy itself cause changes in the cardiovascular system making identification of these cardiac lesions more difficult and challenging. Although cardiac disorders complicate 1% of the pregnancies, around 20% of the maternal deaths are attributable to cardiac disorders. Adverse cardiac complications can be predicted by a validated cardiac risk score which can help in identifying and risk stratifying the heart disease in pregnancy and prevent the maternal mortality. Most of the deliveries in the developing countries like India are either conducted in peripheral hospital or by a health care paramedic. Thus identification and timely referral of these patients to a physician and cardiologist is important in deciding the mode of the treatment and anticipated risk of continuing the pregnancy. Careful selection of high risk patients requiring referral to a tertiary care hospital for cardiac interventions is very important and has to be taken in consultation with the physician. With proper work up, risk stratification and regular follow up, it may be possible to manage the pregnancies complicated by low and intermediate heart disease at a peripheral hospital with help of a physician. Managing these patients at peripheral hospital results in reduction in health care cost, optimal utilisation of resources, better patient satisfaction and optimal feto-maternal outcome. We are presenting a cross-sectional observational study of pregnancies complicated by low and intermediate risk heart diseases which were managed at a peripheral hospital.

Material and methods

All the pregnancies between July 2012 to April 2015 reporting to a peripheral hospital in North India were screened for presence of heart disease with detailed history and clinical examination. All the patients with a known underlying heart disease or suspected to have a heart disease either on clinical or on ECG were referred to physician of the hospital and then underwent trans-thoracic echocardiography by the cardiologist from a nearest available hospital for confirming the heart disease. All the patients with confirmed echocardiographic evidence of heart disease were risk stratified into low risk, intermediate risk and high risk according to history of cardiac intervention/surgery, symptoms (New York Heart Association (NYHA) Class), mitral and aortic valve area, ejection fraction,

cyanosis, Eisenmenger syndrome. All the high risk patients (NYHA Class III & IV symptoms, severe stenotic lesions, Eisenmenger syndrome, cyanosis and pulmonary arterial hypertension (PAH) in whom the cardiac intervention was contemplated, Ejection fraction of less than 40%) were referred to tertiary level hospital for evaluation, management and follow up. These patients were excluded from the study. All the patients with low to intermediate risk cardiac lesions were followed up at the peripheral hospital only in consultation with the physician of the hospital. All the patients were admitted at 36-37 weeks of gestation with aim of spontaneous vaginal delivery. Caesarean section was done only for definite obstetric indications. Instrumental delivery was done wherever required to reduce the second stage of labour. Period of gestation, mode of delivery, cardiac and other complications, birth weight of the neonate, requirement of NICU admission and immediate post partum complications were noted. All the data was tabulated and analysed.

Exclusion Criteria

1. Patients with high risk cardiac lesions as defined above
2. Patients opting for medical termination of pregnancy
3. Patients who were unwilling for delivery at a peripheral hospital

Results

Total pregnant patients who reported to the peripheral hospital for antenatal check up were 4476 from July 2012 to April 2015. Sixty two patients were suspected to have heart disease based on the history and clinical examination. Total 49/62 patients were detected to have a cardiac abnormality on transthoracic echocardiography. Out of them 22 were old known cases of cardiac disease and 27 were freshly detected. Ten cases were excluded from the study (five patients had moderate to severe mitral stenosis, two had Eisenmenger's syndrome, two opted for medical termination of pregnancy and one had severe PAH). Total 39 pregnant patients were delivered at the peripheral hospital out of which 37 were booked cases and 2 were unbooked cases. Mean age was 26.6 years with 8 patients more than 30 years. Of the patients who were delivered at peripheral hospital 21(53.83%) were primigravida. Twenty six patients(66.67%) were in NYHA grade 1 and 13 (33.33%) patients were in NYHA grade II (Table 1). One unbooked patient presented at 32 weeks of pregnancy in labour with

NYHA class II symptoms. Rheumatic heart disease was the commonest cause of heart disease complicating 82.05% of the pregnancy with mitral valve being the most commonly involved valve. Four patients had congenital heart disease (two each with patent ductus arteriosus and atrial septal defect), 2 patients had mitral valve prolapse and one patient had peripartum cardiomyopathy. Eighteen patients (46.15%) were known cases of cardiac disease, whereas 20 patients (51.28%) were diagnosed to have a cardiac disease during the pregnancy. One patient was diagnosed to have a peripartum cardiomyopathy in the immediate post partum period. Maternal complications were noted in 7 (17.94%) patients. These included antepartum haemorrhage in 2 patients, anaemia requiring blood transfusion in 2 patients, post partum haemorrhage, pregnancy induced hypertension and heart failure in 1 patient each. There was no maternal mortality. There was one still birth at 32 weeks and the patient was a known case of rheumatic heart disease and presented for the first time to the hospital in premature labour. Spontaneous vaginal delivery was done in 32 (82.05%) patients whereas caesarean section was done in 7 (17.95%) patients. Ten cases who delivered by spontaneous vaginal delivery required instrumentation with outlet forceps/ vacuum application and 3 required induction of labour. Birth weight was noted to be less than 3000 grams in 30 neonates and less than 2500 grams in 6 neonates. Six neonates required NICU care and 1 was a still birth (Table 2).

Discussion

Underlying heart disease is the second indirect cause of maternal mortality in India (4). Pregnancy can be classified as high risk if the patient is symptomatic with Grade III or IV dyspnea, severe stenotic lesions (aortic valve diameter < 1.5 cm² and mitral valve area < 2.0 cm²), pulmonary arterial hypertension, Eisenmenger syndrome, left ventricular ejection fraction < 40%, Marfan's syndrome with aortic root diameter < 40mm, uncorrected cyanotic heart lesion and presence of mechanical valve. The patients with a known cardiac disorder should undergo pre-pregnancy counselling and risk assessment prior to conception. Identifying high risk pregnancies and their timely referral to tertiary care centre is very important to reduce the maternal mortality. In our study the prevalence of heart disease complicating the pregnancy was 49 (1.09%) and 79.59% of the pregnancies were complicated by low and intermediate risk cardiac disease. Rheumatic heart disease continues to be commonest cause of heart disease complicating the pregnancies in our setting which has been seen in other Indian studies also. Thirty seven patients (94.87%) were booked cases whereas 2 cases were un-booked, out of which 1 presented in labour and had a still birth. Un-booked cases and late presentations are the most common causes of foeto-maternal mortality in our country. Maternal risk for cardiac complications can be predicted by a validated risk score which can help in identifying the high risk mothers and prevent cardiac complications. Risk score depends upon prior cardiac events (heart failure, transient ischemic attacks and stroke), prior arrhythmias, NYHA III or IV status with or without cyanosis, valvular or outflow tract obstruction (Aortic valve area < 1.5 cm², Mitral valve area < 2.0 cm², LVOT peak gradient > 30 mm Hg) and Ejection fraction < 40% (3). One point is given to each criterion. The maternal cardiac complications rate for 0.1 and more than 1 points is 5%, 27% and 75% respectively. Thus any patient with even a single risk factor should be managed at a tertiary care centre. Careful decision to terminate the pregnancy and counselling to avoid future pregnancies is required in high risk patients. Cardiac disease in pregnancy can also be classified as low, intermediate and high risk pregnancy which will enable to stratify the maternal risk of the pregnancies.

Mortality in mildly symptomatic pregnant females with heart disease has been found to be around 1% which is same as general population (7). On the other hand the mortality in severely symptomatic pregnant females with heart disease was noted to be 10-15% (8). In Indian setting mortality is high as most of the deliveries are conducted in villages and social stigma of not disclosing the cardiac disease before the marriage (9). Identifying these diseases timely, pre

pregnancy assessment and counselling, proper risk stratification will go in a long run to improve the foeto-maternal outcome in these patients. In our study also there was no maternal mortality and there was only one stillbirth noted in an un-booked case at 32 weeks. Most of the low and moderate risk pregnancies were managed at a peripheral hospital with help of a physician. However more studies need to be done to corroborate this fact.

Conclusion

The prevalence of heart disease complicating pregnancies was around 1.09%. Eighty percent of pregnancies with heart diseases could be managed at peripheral set up with help of physicians. The factors which favoured optimal outcome at a peripheral hospital was booked case, NYHA class I-III status, Ejection fraction more than 40% and regurgitant valvular lesions. Thus careful selection and timely referral of high risk pregnancies with heart disease to a tertiary care set up is important to improve foeto-maternal outcome. However, more such multi-centric studies need to be undertaken and uniformity of the obstetric care to be ensured at primary and secondary level points.

Conflict of interest: None

Ethical approval: Study approved by institutional ethics committee

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Table 1 : Baseline Characteristics

Parameters	Variables	Value	Percentage
Age	Mean Age	26.6 years (S.D. (3.99))	
	20-25 years	12/39	30.77%
	25- 30 years	16/39	41.03%
	>30 years	11/39	28.20%
Parity	Primigravida	21/39	53.85%
	Second Gravida	12/39	30.77%
	Third Gravida	6/39	15.38%
Pre existing heart disease (prior to conception)		18/39	46.15%
Heart disease diagnosed in present pregnancy/ post natal period		21/39	53.85%
	Diagnosed in first trimester	10/21	
	Diagnosed in second trimester	8/21	
	Diagnosed in third trimester	2/21	
	Diagnosed in post natal period	1/21	
NYHA class at presentation	I	26/39	66.67%
	II	13/39	33.33%

Table 2 : Different cardiac lesions and Foeto-maternal complications

	N	%	
Rheumatic Heart Disease	32/39	82.05%	
Congenital heart disease	4/39	10.25%	
	ASD	2/4	
	PDA	2/4	
Mitral Valve Prolapse	2/39	5.12%	
Peripartum Cardiomyopathy	1/39	2.56%	

Maternal complications		7/39	17.94%
	Heart failure	1/7	
	Anaemia requiring blood transfusion	2/7	
	APH	2/7	
	PPH	1/7	
	PIH	1/7	
Neonatal Complications		13/39	33.33%
	Still Birth	1/13	2.56%
	NICU Admissions	7/13	
	Weight < 2500 grams	6/13	
Birth Weight			
	< 2000 grams	2/39	
	2000-2500 grams	4/39	
	>2500 grams	24/39	
	>3000 grams	9/39	

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