Original Article

Evaluation and Outcome of Pregnancy Complicated by Heart Disease

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Abstract

Objective: To assess the maternal and fetal outcome in pregnancies associated with maternal heart disease.

Methods: The study included 50 pregnant cardiac patients from the Department of Obstetrics and Gynaecology Unit-I Nishtar Hospital, Multan. Age, parity, type of cardiac lesions, class of disease, specific treatment given, obstetric and cardiac complications, maternal and fetal outcome were analyzed.

Results: Out of 5100 obstetric patients, 50 cases of heart disease were diagnosed, giving a frequency of 0.98%. The ages of the women ranged between 26-35 years (64%) and 52% were multigravida. Congenital Heart Disease (CHD) was present in 28% cases and 66% had Rheumatic Heart Disease (RHD) and mitral stenosis which was the dominant lesion. Anticoagulation was given to 3 (6%) cases, Digoxin was required in 20 (40%) cases, Diuretics 18 (36%) while antihypertensive and beta blockers were given to 4 (8%) cases each, whereas prophylactic antibiotic was given to all (100%) patients. Congestive Cardiac Failure (CCF) was seen in 10 (20%) cases, infective endocarditis and thromboembolism in one (2%) case each. Maternal mortality occurred in one (2%) case and one (2%) neonatal death was encountered. Cardiomyopathy was seen in 2 (4%) cases. Vaginal delivery was had in 91.49% women and 80% were term pregnancies. Preterm deliveries were 14% and 42.55% babies were of low birth weight.

Conclusion: Although, heart disease is rare among pregnant women, it needs to be carefully managed in a tertiary care setting by a team of obstetrician, cardiologist and anaesthesiologist, to obtain good maternal and foetal outcome (JPMA 55:416;2005).

Introduction

Heart diseases are the most important non obstetrical causes of maternal deaths during pregnancy, accounting for almost 10% of maternal deaths. They complicate 1-3% of all pregnancies with congenital defects in 70-80% of the cases.[1] In developing countries like Pakistan, rheumatic heart disease (RHD) still accounts for the majority of cases and mitral stenosis is the most frequently observed valvular lesion. The risk of congenital heart disease (CHD) in the offspring is 2-4% if either parent is affected.[2,3]

Valvular heart disease is often recognized for the first time during pregnancy, when the pregnancy associated cardiovascular changes increase the demand on the heart and exacerbate the symptoms and signs of valvular lesion.[4]

The presenting symptoms are shortness of breath, palpitation, syncope, fatigability and haemoptysis. Examination may reveal cyanosis, clubbing, raised JVP, cardiomegaly, murmurs, arrhythmias and basal crepts. The functional capacity of the heart is assessed by investigations as electrocardiography (ECG) echocardiography, oxygen saturation and complete blood examination.[5] Close liaison between obstetrician and cardiologist is required throughout pregnancy. If possible pregnancy should not be allowed in patients with uncorrected severe valvular lesion or those requiring anticoagulation. This is due to increased maternal and foetal morbidity and mortality. Medical therapy and balloon valvuloplasty have greatly improved the outcome and now term gestation is possible.[6]

Foetal outcome depends on the degree of maternal

well being. Foetal mortality is not exceptionally high in patients with New York Heart Association (NYHA) class I and II, however if there is associated pulmonary hypertension there is a risk of abortions, intrauterine growth retardation, preterm delivery and early neonatal death.[7]

In this study we evaluated 50 pregnant patients having various cardiac problems and described their outcome.

Patients and Methods

Inclusion Criteria

Fifty pregnant patients booked or non booked, who were admitted in the department of obstetrics and gynaecology unit-I of Nishtar Hospital, Multan with diagnosed cardiac disease or had symptoms and signs suggestive of cardiac disease which were later confirmed by relevant investigations.

Exclusion Criteria

Pregnant females with similar symptoms and signs proved to be due to physiological, psychological, or some medical disorder like anaemia were excluded.

Thorough obstetrical and cardiac evaluation was done by detailed history, clinical examination and investigations as haemoglobin (Hb%), haematocrit, total and differential leucocyte, count erythrocyte sedimentation rate, timed blood glucose estimation, ECG, echocardiography, obstetrical ultrasonography (USG), CTG and Doppler studies (where indicated). Previous medical and surgical record was reviewed (where available). All the data was recorded on a prescribed proforma. After making the definite diagnosis, in collaboration with a cardiologist, specific treatment was instituted according to gestation and cardiac status. Patients with NYHA class I and II were managed on outpatient basis with the advice to take adequate rest, dietary instructions and regular haematinics. They were advised for early consultation if there was infection or signs of decompensation like increasing dyspnoea on exertion, progressive oedema, palpitation (pulse>100/min) and hemoptysis. Patients in NYHA class III and IV remained hospitalized throughout pregnancy. They were examined daily for cardiac status, CTG and biophysical profile was performed twice a week started after 28 weeks gestation, serial growth scans fortnightly, and evaluated weekly by cardiologist. Epidural analgesia was given to stable patients during labour. Prophylactic antibiotics were given to all patients. Intrapartum details, postpartum complications, and foetal outcome was recorded.

Finally the results were analyzed to find the ultimate prognosis of various cardiac disorders on the maternal and foetal outcome.

Results

Fifty cases of heart disease were diagnosed out of 5100 obstetric patients giving a frequency of 0.98%. Sixty four percent of patients were between the age group of 26-35 years and were multigravida (52%). Rheumatic heart disease was the common etiology (66%) and mitral valve was involved in all cases. In 42% cases mitral stenosis was the isolated lesion and 28% had congenital heart disease (Table-1). The commonest (71%) surgical procedure employed was mitral valvotomy. Table 2 depicts the obstetrical outcome. There were 3 abortions and out of 47 remaining cases 40 (80%) were term pregnancies, of which 4 (8.5%) had caesarean sections and 43 (91.42%) were delivered vaginally.

Table 1. Types of Cardiac Lesion (n=50).

	No. of cases	Percentage
(a) Congenital heart disease		
Atrial septal defect	5	10
Ventricular septal defect	1	2
Eisenmenger's syndrome	2	4
Fallot's tetralogy	1	2
Mitral valve prolapse	5	10
Total	14	28
(b) Rheumatic heart disease		
Mitral stenosis	21	42
Mitral stenosis + aotic stenosis	10	20
Mitral stenosis + mitral regurgitation	2	4
Total	33	66
(c) Other cardiac conditions		
Myocardial infarction	1	2
Peripartum cardiomyopathy	1	2
Hypertrophic cardiomyopathy	1	2
Total	3	6

Prophylactic antibiotic was given to 100% of the cases. Low molecular weight heparin (LMWH) was given to those with prosthetic valve replacement. Digoxin, Diuretics and antihypertensives were administered as indicated by the clinical situation. Table 3 describes the various obstetrical and medical complications observed during pregnancy, labour and post partum period. Improvement in antenatal care, prompt diagnosis and referral of high risk cases to tertiary care setting can ultimately prevent these complications and lead to favourable outcome for both the mother and foetus. There was only one maternal death in a case of Eisenmenger's syndrome (2%). The foetal outcome of 47 cases was all live births with average weight of 2 kg and APGAR score of above 6 was observed in 70.2% of cases. Low birth weight babies numbered 42.55%. One (2.13%) neonatal death occurred due to prematurity and low birth weight.

Table 2. Pregnancy Outcome and Mode of Delivery (n=50).

Pregnancy outcome	No. of cases	Percentage
Spontaneous abortion	2	4
Therapeutic abortion	1	2
Preterm delivery	7	14
Term delivery	40	80
Total	50	100
Mode of delivery (n=47)		
Caesarean section	4	8.51
Vaginal delivery	43	91.42
Spontaneous onset of labour	41	87.23
Induction of labour	2	4.25
Assisted forceps delivery	39	82.9
Non assisted delivery	4	8.51

Table 3. Complications (n=47).

Obstetrical	No. of cases	Percentage
Pregnancy induced hypertension	4	8.5
Breech	1	2
Twin pregnancy	1	2
Placenta praevia	1	2
Previous caesarean section	1	2
Postpartum haemorrhage	5	10.6
Total	13	27.6
Medical		
Post partum infective endocarditis	1	2
Congestive cardiac failure	10	21.2
Respiratory tract infection	12	25.5
Pulmonary embolism	1	2

Discussion

Pregnant women with associated cardiac disease represent a major challenge for the obstetrician and cardiologist involved in their care. Careful clinical evaluation and judicious use of diagnostic tools (mainly echocardiography) can result in better outcome.[8] In this study we observed the whole spectrum of the condition and it was noted that many symptoms and signs of normal pregnancy mimic those indicative of heart disease, thus making clinical diagnosis difficult.

In our study the frequency of the condition turned out to be 0.98%, which is very close to the observation by other studies.[1,2,9] In the developed world due to good surgical access for childhood congenital heart disease more girls are entering the child bearing age and constitute about half of the cases encountered during pregnancy.[10] Where as in the developing countries like ours, RHD still comprises of 90% of the cases.[5] This preponderance is due to poor socioeconomic status, overcrowding and poor access to medical care. But during the last decade this incidence has fallen to 66-75% due to better awareness of antenatal surveillance through media and availability of antibiotics.[11]

The ratio of RHD to CHD in our study is 3:1 which is comparable to other developing countries. We encountered 28% cases with CHD compared to 19.1% reported by others.[12] The predominant congenital cardiac defect was artrial septal defect.[13-15] The incidence of RHD in our study was 66%, while in other studies it was 88%[13], 80%[15] and 55.7%.[12] Mitral stenosis was the predominant lesion in all cases. It was associated with aortic stenosis in 20% and mitral regurgitation in 4% while 9% incidence of aortic stenosis and 10% mitral regurgitation cases were reported in another study.[15] A study by Gupta et al observed 29.95% cases with cardiac complications.[11] The prevalence of cardiac complications was 24% in our study which is similar to the observation by another study (23.5%).[12] CCF was encountered in 20% cases comparable to 12.3%[12] and 38%[16] in other studies. During the first 24-72 hours post delivery, significant fluid shifts can lead to congestive cardiac failure. So vital signs and fluid balance charts should be carefully maintained in the immediate post partum period.[17]

Infective endocarditis and pulmonary thromboembolism were observed in 2% cases each, which is close to the observations in a study describing the thromboembolism in 1.9% and infective endocarditis in 0.5% cases.[12] Cardiomyopathy was seen in 4% of the cases which is very close to the incidence (4.3%) in another study.[12] Maternal death occurred in only one (2%) case, in agreement with the results (2.7%)[12] and 2%[16] mentioned by others. Due to improved perinatal care, despite high maternal morbidity, mortality is rare.

Anticoagulation was given to 3 (6%) cases in our study, who had mechanical valve prosthesis. The women were counseled about the risks involved. The recommended policy is that low molecular weight heparin (LMWH) is given in the first trimester followed by warfarin between 13 and 36 weeks, reverting to heparin in the last 4 weeks of pregnancy and labour. It is usually not required for tissue valves which are less thrombogenic but less durable than mechanical valves.[17,18]

Spontaneous onset of labour is preferred in cardiac patients and vaginal delivery is the best option unless there is an obstetric contraindication. Cardiac conditions in which caesarean section is the safest option are coarctation of aorta, pulmonary hypertension and Marfan's syndrome. For an elective caesarean section general anaesthesia is employed as it causes less haemodynamic disturbance. Epidural analgesia is

is contraindicated in hypertrophic cardiomyopathy.[19]

In our study 91.49% cases delivered vaginally and 80% were term pregnancies. Preterm deliveries were 14%, which is in accordance with the result of 13% in a study by Avila et al[12] and in contrast to a study by Haneed et al showing it to be 23%.[16] Foetal outcome depends on the degree of maternal well being and gestational age. Cardiac patients have babies lighter by about 200 gms.[13] In our study 42.55% babies were low birth weight compared to 36%[14] and 21% in other studies.[16] There was one (2%) early neonatal death due to patent ductus arteriosus. The incidence of fetal congenital cardiac disease is 2-4% in women with congenital heart disease.[20]

The rate of spontaneous abortion was 4% and therapeutic abortion was performed in one (2%) case, while in a study by Conolly and Warnes, it was 17% and 6.3% respectively.[21] Termination of pregnancy was indicated in patients with primary pulmonary hypertension, Eisenmenger's syndrome and Marfan's syndrome with dilated aortic root.[21]

Multidisciplinary care in the antenatal period and during labour with continued surveillance extended through the puerperium along with contraceptive advice, enhance the chances of favourable outcome in these high risk cases. Though our study included a limited number of patients but the results are convincingly comparable to other studies conducted world wide.

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