Peripartum Cardiomyopathy Presenting to Cardiology Department of Mayo Hospital, Lahore

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Cardiac failure occurring in last trimester of pregnancy or within one to six months after delivery in a woman without a history of heart disease and with no cause for heart failure other than pregnancy is termed as peripartum cardiomyopathy. To determine fetomaternal morbidity and mortality in women presenting with peripartum cardiomyopathy, we did an open non-randomized observational descriptive study at Department of Cardiology Mayo Hospital, Lahore from January 2004 to Oct 2005. The women referred from Lady Willingdon and Lady Aitchison Hospitals to Cardiology Department of Mayo Hospital during last trimester and after delivery for work up of heart failure were included. Twenty five women presented with heart failure due to peripartum cardiomyopathy were included in this study, 40% in last trimester, 40% within one month and 20% within 4 month after delivery. The mean age was 35 $\pm$ 5 years. Out of these 2 (8%) were primiparous, 13 (52%) were multiparous and 10 (40%) were grandmultipara. Ten (40%) were booked and 15 (60%) were nonbooked for antenatal care. Twenty (40%) patients were diagnosed for the first time and 5 (20%) had recurrence. Based on NYHA classification 20% were in class I, 40% class II, 20% class III and 20% in class IV. The patients were on standard medical treatment. All patients reviewed at follow up after 1, 6, and 12 months. No maternal mortality occurred. Antenatal ward admission was required for 32% women due to obstetric reasons and 8% due to cardiac cause. Five had spontaneous labor and 5 inductions were done for obstetric reasons: poor biophysical profile, previous caesarean section, uncontrolled diabetes, breech presentation and fetal distress. Three babies have intrauterine growth retardation. On echocardiography mean ejection fraction was 20-25% with global hypokinesia, 5 patients had clot in LV apex, 10 had whiff of mitral regurgitation and tricuspid regurgitation. We conclude that peripartum cardiomyopathy has high morbidity and mortality. Women are very much receptive about contraception in the immediate post partum period, therefore counseling of the patient and their family should be done to reduce maternal mortality.

Key Words: Pregnancy, peripartum cardiomyopathy, fetomaternal complications.

Pregnancy imposes an additional burden on the cardiovascular system, both in a normal woman as well as in the cardiac patient. Pregnancy brings the cardiac status down by at least one step[1].

Cardiac failure occurring in last trimester of pregnancy or within one to six months after delivery in a woman without a history of heart disease and with no cause for heart failure other than pregnancy is termed as peripartum cardiomyopathy[2]. This syndrome has been defined by following four criteria:

1. The development of cardiac failure in the last trimester of pregnancy or within 6 months of delivery.
2. Absence of an identifiable cause of heart failure.
3. Absence of recognizable heart disease prior to the last trimester of pregnancy.
4. Left ventricular systolic dysfunction demonstrated by classical echo criteria such as depressed shortening fraction or ejection fraction[3].

Peripartum cardiomyopathy is a rare and unexplained cause of heart failure. The incidence varies from 1:4000 to 1:1000. It is higher in Haiti and some parts of Asia and Africa[4-5]. It can occur at any age but is more common in older than 30 years. There is a strong relation between the development of peripartum cardiomyopathy, twin pregnancy, pregnancy induced hypertension and the use of tocolytic therapy[5-6]. In patients who continue to have symptoms and signs of disease for more than 6 months after parturition, the mortality rate is high, and subsequent pregnancy is especially dangerous.

The women who desire to become pregnant again may be having increased risk of recurrence. The long-term prognosis in these patients depends on whether cardiomegaly has resolved within 6 months after the onset of symptoms or not. The clinical course of peripartum cardiomyopathy varies, with 50-60% of patients showing complete or near complete recovery of clinical status and cardiac function, usually within the first 6 months of delivery; the rest of the patients demonstrate either further clinical deterioration leading to cardiac transplant, or premature death or persistent LV dysfunction and chronic heart failure[7]. If it does not resolve, the 5-year mortality rate is 6%. If cardiomegaly does not resolve and another pregnancy intervenes, cardiomyopathy recurs in 50% of cases with 19% mortality rate[8].

Approximately 20% of peripartum cardiomyopathy patients survive only because they get cardiac transplants. Nevertheless women with a history of peripartum cardiomyopathy have a significant risk of deleterious fetal and maternal outcome in subsequent pregnancies, even if their left ventricular function has returned to normal.

This study was conducted to determine fetomaternal complications seen in pregnancy and post delivery women

with peripartum cardiomyopathy presenting to Cardiology Department of Mayo Hospital, Lahore.

Patients and methods:

An open non-randomized observational descriptive study based on purposive sampling technique was conducted from January 2004 to Oct 2005, at the Department of Cardiology Mayo Hospital Lahore. Patients were referred from Lady Willingdon, Lady Aitchison and districts headquarter hospitals. Detailed history and clinical examination was undertaken in all patients and graded by New York Heart Association (NYHA) Functional classification. All patients were seen by multiple cardiologists and diagnosis was confirmed at history, clinical examination and Echocardiography.

Detailed history included the background information regarding age, parity, booking status, obstetric history, history of hypertension, diabetes mellitus, relevant past and family history. In particular clinical presentation, parity, children mortality, hypertension, eclampsia, abortion, NYHA class, admission in antenatal ward and obstetric and medical complications were recorded in these women during pregnancy, labor and immediate postpartum period. Maternal outcome included medical and obstetric complications and maternal mortality. Fetal outcome measures included prematurity, intrauterine growth retardation and perinatal mortality, intrauterine death and indicated termination of pregnancy. Mode of delivery, duration of labor, Apgar score of neonates, their birth weight, gestation at birth in weeks and admission to neonatal ICUs were also studied. Data was analyzed using Statistical Programme for Social Sciences (SPSS) version 10, in the form of percentages (relative frequencies) of variables.

Results:

Twenty five women presented with heart failure due to peripartum cardiomyopathy were included in this study, 10 (40%) in last trimester, 10 (40%) within one month after delivery and 5 (20%) within 4 month after delivery. The mean age was 35±5 years. Out of 25 patients 2(8%) were primiparous, 13(52%) were multiparous and 10(40%) were grandmultipara. Regarding antenatal care 10(40%) were booked and 15(60%) were nonbooked. Twenty (40%) patients were diagnosed for the first time and 5 (20%) had recurrence, amongst them 3 were on heart failure medicines and 2 were not. According to NYHA Functional classification 5(20%) were in class I, 10(40%) class II, 5(20%) in class III and 5(20%) in class IV. The patients were on standard medical treatment. All patients recovered at follow up of 1,6,12 months. No maternal mortality occurred (Tables 1-2).

Antenatal ward admission was required for 8(32%) women due to obstetric reasons and 2(8%) due to cardiac cause. Five (20%) had spontaneous labor and 5 (20%) inductions of labor were done for obstetric reasons e.g. poor biophysical profile, previous caesarean section, uncontrolled diabetes, breech presentation and fetal distress. Mean duration of labor was 3 hours. Obstetric complications included poor biophysical profile in 2(8%) women, 3(12%) had pregnancy induced hypertension and diabetes, 2(8%) had preterm labor and 1(4 %) had preterm premature rupture of membranes. As for as fetal outcome is concerned, 3(12%) babies have intrauterine growth retardation (IUGR), of which 2(8%) had <1000gm birth weight and 1(4%) had perinatal death due to prematurity.

Table 1: Presentation profile of patients with peripartum Cardiomyopathy

Clinical History	No.	%age
Last trimester	10	40
One month post-delivery	10	40
4th month post-delivery	05	20
Parity – Primi	02	08
Multipara Grandmultipara	13	52
	10	40
Antenatal follow up		
Booked	10	40
Nonbooked	15	60
Presentation		
First time	20	80
Previous	05	20
NYHA Class		
I	05	20
II	10	40
III	05	20
IV	05	20

Table-2 Fetomaternal Complications

Character	No.	%age
Antenatal ward admission due to		
-Obstetric cause	08	32
-Cardiac cause	02	08
Labour		
Spontaneous	05	20
Induced	05	20
Obstetric complications		
-poor Biophysiology	02	08
-pregnancy induced HT & DM	03	12
-Preterm labor	02	08
-Premature membrane rupture	01	04
Fetal Outcome		
-IUGR	03	12
Echocardiography		
EF (20-25%)	25	100
Clot in LV apex	05	20
Mild MR	10	40
Past h/o DM	05	20
Past h/o HTN	05	20

Echocardiography was performed in all patients at admission and at follow up after 1 and 6 months. Mean ejection fraction was 20-25% with global hypokinesia, 5 (20 %) patients had clot in LV apex, 10 (40%) had whiff of mitral regurgitation and tricuspid regurgitation. Five (20%)

patients were having well controlled diabetes and 5(20%) were hypertensive, which was also well controlled. Five (20%) patients gave past history of heart failure but recovered (Table 2).

Discussion:

According to WHO about half a million women dies each year due to pregnancy or its complications in the developing world[9]. Pregnancy poses a risk even to young and healthy women. The nature of these risks varies from country to country. The maternal mortality in Pakistan is about 5/1000 live birth, which is 50-100 times more than in developed countries[10]. Heart disease is an important non-obstetric cause of maternal death. Pregnancy affects heart adversely and can cause significant morbidity and mortality[2]. The risk of maternal and infant morbidity depends upon the underlying cardiac lesion, functional derangement produced by the lesion and New York Heart Association functional class[11].

The incidence of heart disease in pregnancy varies between 0.3% and 3.5%[12]. In present study 40% patients were diagnosed for the first time and 20% had its recurrence. Out of these 5, 3 were on heart failure medicines and 2 were not taking any medicine. No maternal mortality observed upto one year of follow up.

In developing countries rheumatic heart disease is still the most common lesion in pregnant patients with cardiac disease. Overall, heart disease complicates pregnancy at a rate of 1.3 per 100 deliveries[13]. A recent local study revealed frequency of heart disease in pregnancy as 0.97%[14].

Subsequent pregnancies in women with peripartum cardiomyopathy are often associated with relapse, leading to left ventricular dysfunction, symptomatic deterioration, and even death. Although the likelihood of such relapse is greater in patients with persistently abnormal cardiac function, it has also been reported in women in whom left ventricular function is restored after the first episode[15]. A survey on the risk of subsequent pregnancy in women with history of peripartum cardiomyopathy reported no mortality in patients with normal left ventricular ejection fraction but was 19% in patients with depressed left ventricular ejection fraction[16]. Similarly no mortality reported in our study as well because of better treatment options available. The exact mechanism of recurrent cardiac dysfunction in subsequent pregnancy in these women is not well defined[15]. Lampert et al[17] revealed reduced contractile reserve in these women even after apparent recovery of left ventricular function. For these reasons subsequent pregnancies should be discouraged in patients with peripartum cardiomyopathy who has persistent left ventricular dysfunction; women with recovered cardiac failure can also not be guaranteed an event free pregnancy, and recurrence of the disease is possible. The risk of mortality in such cases, however, seems to be small[18].

Conclusion:

Peripartum cardiomyopathy has high morbidity and mortality. The successful management of these women demands close cooperation between the patient, obstetrician, cardiologist and the family. Women are very much receptive about contraception in the immediate post partum period, therefore counseling of the patient and their family should be done to reduce maternal mortality.

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