

Risk factors and Fetomaternal Outcome in Pregnant Women with Peripartum Cardiomyopathy

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ABSTRACT

Objective To determine risk factors and fetomaternal outcome in pregnant women with peripartum cardiomyopathy.

Study design Descriptive cross sectional study,

Place & Duration of study Department of Obstetrics and Gynaecology Unit II, Civil Hospital Karachi, from January 2018 to December 2018.

Methodology Women with the diagnosis of peripartum cardiomyopathy, irrespective of age and parity were enrolled after taking an informed consent. Women with the history of valvular heart disease and anemia were excluded.

Results A total of 63 pregnant women with peripartum cardiomyopathy were enrolled in the study. The mean age and gestational age was 31.75 ± 3.90 year and 35.46 ± 3.10 weeks respectively. The mean BMI was 26.27 ± 4.12 kg/m² and the mean ejection fraction was $36.26 \pm 7.07\%$. Eleven (17.5%) patients were primigravida and 23 (36.5%) women had two to four children. Parity of >4 was found in 29 (40.5%) patients. Pre-eclampsia was found in 47 (74.6%) and chronic hypertension in 16 (25.4%) women. Sixty (95.2%) women had singleton pregnancy and twin pregnancy was found in 3 (4.8%) women.

Out of the total, 48 (76.2%) women underwent cesarean section due to heart failure and pulmonary edema and 15 (23.8%) had spontaneous vaginal delivery. Fifty-two (82.53%) babies were born alive and 11 (17.47%) were stillbirth. There were 15 (23.09%) maternal deaths due to different reasons.

Conclusion Peripartum cardiomyopathy is a serious condition of unknown cause that affects women of childbearing age. It is associated with high morbidity and mortality. Diagnosis of disease is challenging and requires vigilance. The successful management demands close cooperation between the patient, obstetrician, cardiologist and the family.

Key words Feto-maternal outcome, Echocardiography, Peripartum cardiomyopathy, Maternal mortality, Stillbirth, Cesarean section.

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INTRODUCTION:

Peripartum cardiomyopathy (PPCM) is a rare, idiopathic and often dilated cardiomyopathy, marked by systolic dysfunction that presents in late pregnancy or in the early postpartum period.¹ In this condition heart failure (HF) occurs in the absence of any determinable heart disease in the last month

of pregnancy or during the first 5 months postpartum. An additional echocardiographic criteria is also required to label this condition.² The European Society of Cardiology recently defined peripartum cardiomyopathy as a form of dilated cardiomyopathy with reduced ejection fraction usually <45% that presents with signs of heart failure at the end of pregnancy or in the early months after delivery in a woman without previously known structural heart disease.³

PPCM is a life-threatening cardiac disorder with mortality rates between 18% - 56% and half of the deaths occurring within three months of delivery.^{4,5} More than half of affected women recover systolic function although some are left with a chronic cardiomyopathy and a minority require mechanical support or cardiac transplantation (or both). It also increases the risk of atrial and ventricular dysrhythmias, thromboembolism and sudden death.⁶

Many risk factors are known to predispose a woman for developing peripartum cardiomyopathy that include advanced maternal age, multiparity, multiple pregnancy, obesity, pregnancies complicated by chronic hypertension, pre-eclampsia, gestational hypertension and black race.^{4,5} In acute cases treatment may involve the use of intravenous vasodilators, inotropic medication and intra aortic balloon pump.⁷ Limited studies are available in international and national literature on this subject. This study was done to find out the maternal and fetal outcomes in patients with PPCM in order to highlight the importance of developing strategies for early detection in a high risk population and ensuring timely management so as to reduce mortality and morbidity associated with this condition.

METHODOLOGY:

This descriptive cross sectional study was conducted at the Department of Obstetrics and Gynecology Unit II, Civil Hospital Karachi from January 2018 to December 2018. Data collection started after taking an approval from the College of Physicians and Surgeons Pakistan. Women with the diagnosis of peripartum cardiomyopathy, irrespective of age and parity were enrolled after taking an informed consent. Women with the history of valvular heart disease and anemia were excluded.

Data were analyzed by SPSS version 20. Mean and standard deviation were calculated for quantitative variables like age and gestational age, BMI and ejection fraction. Frequency and percentages were calculated for qualitative variables like mode of delivery, chronic hypertension, preeclampsia, fetal

and maternal outcome and parity.

RESULTS:

A total of 63 pregnant women with peripartum cardiomyopathy were included. The mean age of the women was 31.75 ± 3.90 year. Most of the women were between age group of 31-35 year which comprises 49.2% of the patients. The mean gestational age of PPCM pregnant women was 35.46 ± 3.10 weeks. Most (n=39 - 61.9%) of the women presented at <37 weeks (preterm) gestation. The mean body mass index (BMI) of women was $26.27 \pm 4.12 \text{ kg/m}^2$. The mean ejection fraction was $36.26 \pm 7.07\%$. There were 11 (17.5%) primigravida in this study. Nearly 1/3rd of the patients (n=23 - 36.5%) had two to four children. A parity of >4 was found in 29 (40.5%) patients. Pre-eclampsia was found in 47 (74.6%) and chronic hypertension in 16 (25.4%) women. Sixty (95.2%) women had singleton pregnancy and twin pregnancy was found in 3 (4.8%) women. Out of the total, 48 (76.2%) women underwent cesarean section due to heart failure and pulmonary edema and 15 (23.8%) had spontaneous vaginal delivery. Fifty-two (82.53%) babies were born alive and 11 (17.47%) were stillbirth. There were 15 (23.09%) maternal deaths due to different reasons. Details are given in table I.

DISCUSSION:

Peripartum cardiomyopathy, an idiopathic condition presenting with cardiac failure secondary to left ventricular systolic dysfunction affecting women in the last months of pregnancy or early puerperium is a challenging ailment. It remains a significant cause of maternal morbidity and mortality.⁸ The incidence of PPCM varies worldwide. The reported prevalence of PPCM in non-African countries ranges between 1:3,000 - 1: 15,000 live births.^{2,9,10} In a study from Pakistan it was found in 1 per 837 deliveries.³ Number of risk factors include both obesity and malnutrition. A poor antenatal care, alcohol and tobacco use, low socioeconomic conditions and long term tocolysis are also found in as risk factors in different studies.¹⁰⁻¹² In our study the common factors found were advanced maternal age, multiparity, obesity, pre eclampsia and chronic hypertension.

The mean age of patients in our study was 31.75 ± 3.90 year which is similar to others where age above 30 years is reported as a high risk of developing peripartum cardiomyopathy.^{3,13,15} Another risk factor is multiparity which is also comparable to other reports.^{3,14} All multiparous patients in our study had no previous history of PPCM. One possible reason could be the presence of cardiac involvement

Table I: Characteristics and Fetomaternal Outcome of Patients With PPCM (n=63)

Variable	n=63	Percent (%)	Mean
Age (Years)			
20-30	22	34.9	31.75±3.9
31-35	29	46.0	
>36	12	19.0	
Parity			
Primigravida	11	17.5	
Gravida 2-4	23	36.5	
Multiparous >4	29	46.0	
Gestational age			
<37 weeks	39	61.9	35.46±3.10
>37 weeks	24	38.1	
BMI (Kg/m²)			
Normal	18	28.6	26.27±4.12
Overweight/Obese	45	71.4	
Ejection Fraction (%)	-	-	36.26±7.09
Pre eclampsia			
Yes	47	74.6	
No	16	25.4	
Chronic Hypertension			
Yes	16	25.4	
No	47	74.6	
Number of Fetus			
Single	60	95.2	
Twin	03	4.8	
Mode of Delivery			
Cesarean Section	48	76.2	
Spontaneous Vaginal Delivery	15	23.85	
Fetal Outcome			
Alive	52	82.53	
Intrauterine Death	11	17.47	
Maternal Outcome			
Alive	48	76.91	
Death	15	23.09	

in previous pregnancies that were sub-clinical. All of our patients presented in an antepartum period and mean gestational age was 35.46±10 weeks showing trend towards the prematurity. Preterm delivery is common among PPCM patients although none of our patients received tocolysis. Study conducted by Bakhta et al found that risk of preterm delivery is higher in patients with peripartum cardiomyopathy.⁹ Majority (71%) of our patients were overweight with a mean BMI is 26.6±4.5 Kg/m²

indicating that overweight or obesity is a risk factor as found in other studies.^{3, 16}

Echocardiography is the most important tool for diagnosing PPCM and assessing the degree of cardiac dysfunction.⁴ In our study the mean ejection fraction was 36.26% which is comparable with study conducted by Memon et al.¹⁷ The study by Sharieff et al reported < 30% ejection fraction in most of the patients.¹⁵ Limited data are available to guide the

timings and mode of delivery in PPCM. According to 2010 European Society of Cardiology working group statement early delivery is not required if the maternal and female conditions are stable. Our study showed that higher number of cesarean sections was performed. Most of the patients in our study were non-booked and had first visit to hospital with severe pulmonary edema and heart failure. This is one of the reasons for higher number of cesarean sections. Other studies showed higher rates of spontaneous vaginal delivery.³ A study of Philippine General Hospital showed 44% rate of cesarean section due to heart failure.¹⁹ Poor prognosis was reported in past in such patients but with advancement in critical care survival rate has improved. Most of the studies reported maternal mortality ranging from 18% to 56%.²⁰ In our study 15 maternal deaths occurred and cardiac failure was the main reason. All of our patients needed ICU care under supervision of cardiologist and anesthesiologist.

Cardiomyopathy affects the fetus as well. The development of PPCM in the mother may be a marker of high risk for the baby.¹⁵ In the study done by Bakhta et al there was an increased incidence of premature and low birth weight babies.⁹ Regarding the neonatal outcome, in this study eleven intrauterine deaths occurred. Main cause of perinatal deaths was prematurity and deteriorating maternal condition. The result of our study is almost similar to that of Hassan et al.³ The women with PPCM along with the family should be properly counselled about future pregnancies. The family should be aware of possibilities of recurrence of cardiomyopathy and higher risk of maternal mortality.

CONCLUSION:

Peripartum cardiomyopathy is a rare but serious condition of unknown cause that affects women of childbearing age. It results in high maternal morbidity with number of stillbirths.

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