

ORIGINAL RESEARCH

Risk Factor and Fetomaternal Outcome in PPCM

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ABSTRACT

Introduction: PPCM is a rare disease, but could be life threatening disease which can lead to significant morbidity and mortality.

Objective: To evaluate risk factors and fetomaternal outcome in patients with PPCM.

Methods: A retrospective study was conducted over a period of 5 years and total 46 peripartum cardiomyopathy cases were collected in TMMC &RC. Collected data included age of the patient, risk factors, obstetric history, time of presentation, diagnosis and Echo findings. There fetomaternal outcome were analyzed.

Results: In the study we found that maximum 23 (49.99%) belongs to age group of 30 to 40 years, 32 (69.56%) were multigravida, 20(43.47%) had hypertensive complications in pregnancy, 18 (39.13%) patients were anemic, 6 (13.04%) maternal mortality & 4 (8.6%) perinatal mortality.

Conclusion: The development of PPCM is known to be significantly influenced by advanced maternal age, multiparity, hypertensive disorders during pregnancy, and anemia.

Keywords: Postpartum cardiomyopathy (PPCM) anemia, preeclampsia, Left ventricular ejection fraction (LVEF).

INTRODUCTION

It is not usual to have peripartum cardiomyopathy (PPCM). The European Society of Cardiology recently defined Peripartum cardiomyopathy as a type of dilated cardiomyopathy with a reduced ejection fraction usually <45%, that manifests as heart failure symptoms at the end of gestation or in the first few months following delivery in women who have never had structural heart disease before.^[1] It causes systolic dysfunction with dilated cardiac chambers that commonly manifests in either late pregnancy or early postpartum period (1st 5 month). Regarding its clinical traits, PPCM is similar to dilated cardiomyopathy, yet it is thought to be a different entity compared to other cardiomyopathies.^[3] A number of risk factors can be responsible for PPCM, which include aged mothers, multi-parity, gestational hypertension, pre-eclampsia, eclampsia, anemia and GDM.^[3] The prevalence of PPCM is 0.1% of all pregnancies, however it has morbidity and death rate of 7–50% in pregnant females.^[4,5] Initial clinical signs and symptoms are comparable to physiological changes in a healthy

pregnancy, which makes it difficult to diagnose.^[5] PPCM consequences include pulmonary embolism (PE), congestive cardiac failure (CCF), systemic thrombo-embolism that can result in stroke, arrhythmias, and cardiac arrest.^[3] Although there is awareness of morbidity and mortality linked to this illness, the precise aetiology is yet unknown. In order to emphasise the significance of developing strategies for early detection in a high risk population and facilitating timely treatment in an effort to minimise morbidity and mortality associated with this condition, this study was conducted to identify the risk factors, maternal and fetal outcomes in patients with PPCM.

MATERIAL & METHODS

This retrospective study was conducted among women admitted with diagnosis of PPCM at the Obstetrics & Gynaecology Department of Teerthanker Mahaveer Medical research centre. Data were collected through case records from June 2017 to December 2022. 46 cases diagnosed with PPCM were included in the study.

Inclusion Criteria

All pregnant patients with clinical features of heart failure either in pregnancy, 1 month peripartum or within first 5 months postpartum.

Exclusion Criteria

- Previous heart failure
- Chronic obstructive pulmonary disease
- Valvular heart disease

To evaluate the risk factors and clinical characteristics, a thorough medical history and clinical examinations were recorded. Factors like maternal age, parity, singleton and multiple pregnancy, anemia, GDM and hypertension were noted. An ECG, echocardiogram and chest X-ray were used to confirm the diagnosis of peripartum cardiomyopathy, which was made based on clinical characteristics. Patients were managed according to the proposed standard guidelines. The maternal outcome was studied in terms of timing and mode of delivery, need for ICU admission, need for inotropes and mortality. Fetal outcome was studied in terms of birth weight, need for NICU admission, morbidity & mortality.

RESULTS

Table 1: Demographic profile of study population

Age	No. 46	% age
19-24	10	21.3%
25-29	13	28.26%
30-34	14	30.43%
35-40	9	19.56%
Parity		
Primi	14	30.43%
Multi	32	69.56%
2	12	26.08%
≥3	20	43.4%
Socioeconomic status		
Upper class	4	8.8%
Upper Middle class	9	20%
Lower Middle class	20	44.44%
Lower class	12	26.6%

Out of 46 patients 14 (30.43%) were aged 30-34 years, 9 (19.56%) patients were aged 35 - 40 year.

Table 2: Obstetrics risk factor & Associated comorbidity

Risk factors	No. 46	% age
Singleton pregnancy	37	80.43%
Multiple pregnancy	9	19.56%
Previous history of PPCM	2	4.3%
Severe Pre-eclampsia	11	23.91%
Eclampsia	9	19.56%
Anemia	18	39.13%
Moderate	6	33.33%
Severe	12	66.66%
GDM	3	0.65%
Time of diagnosis		
Antepartum	38	82.5%
Postpartum	8	17.39%

Table 3: Echo findings

LV Ejection fraction	No. 46	%age
<30%	12	26.08
30-45%	34	73.91
Mitral regurgitation		
Mild	10	21.73%
Moderate	7	15.21%
Severe	4	8.6%
Severe PAH	3	6.5%
Thromboembolism	0	0

A considerable decrease in the ejection fraction was present in the majority of patients, who had left ventricular systolic dysfunction. 12 (26.08%) women had ejection fraction less than 30%. 21 patients had mitral regurgitation of whom 4 (8.6%) had severe regurgitation. Severe Pulmonary hypertension was seen in 3 (6.5%) and none of the women had thromboembolic stroke.

Table 4: Mode of delivery and timing of delivery

Mode of delivery	No. 46	% age
Spontaneous vaginal delivery	28	60.86%
Instrumental delivery	2	4.34%
C-section	16	34.78%
Preterm delivery	26	56.52%
Term delivery	20	43.47%
Post term delivery	0	-

We found 28 (60.86%) patients delivered via vaginal route, 2 (4.34%) had instrumental delivery & 16 (34.78%) patients delivered via C-section.

Out of 46 patients 26 (56.52%) have preterm babies and 20 (43.47 %) have term babies.

Table 5: Maternal and fetal outcome

	No. 46	% age
Need for ICU admission	32	69.56%
Need for ionotrops	28	60.86%
Recovery	40	86.95%
Mortality	6	13.04%
Birth weight		
≥2.5 kg	20	43.47%
<2.5kg	26	56.52%
Need for NICU admission	18	39.13%
Perinatal mortality	4	8.6%

Table 6: Comparison of characteristics between survivors and non survivors

Characteristic	Survivors (40)	Non survivors (6)
Mean age ±SD	32± 4.2	32± 6.2
Maternal comorbidities		
Anemia	9 (22.5%)	2 (33.33%)
hypertensive disorders in pregnancy	15 (37.5%)	5 (83.33%)
LVEF <30%	6 (15%)	6 (100%)

DISCUSSION

The incidence of PPCM varies very widely across the world, ranging from 1:15,000 to as common as 1:100.^[6] Very few studies have been conducted mainly in developing countries due to low prevalence. Risk factors for PPCM which have been previously studied include multiparity, advanced maternal age, multiple gestation, gestational hypertension, preeclampsia, family history, smoking and maternal cocaine abuse.^[7] In our study most of the patients 20 (44.44%) belongs to Lower Middle class.

The majority of patients 23 (49.99%) with PPCM diagnosed were between the age group of 30 to 40 year. Elkayam et al^[8] had shown that PPCM can happen at any age, however a larger incidence was identified in women aged 30 year and above.

In opposition to Agarwal et al^[9] who discovered that 56% of patients were primigravida, we reported 32 (69.56%) multipara. This signifies that multiparity might be a risk factor of PPCM.

We found 37 (80.43%) singleton pregnancy and 9 (19.56%) patients with multiple gestation. 2(4.3%) women had previous history of PPCM in the first pregnancy. 8 (17.39 %) out of 46 patient diagnosed with PPCM in postpartum period (within 1 week of delivery).

Similar to Murali et al^[10] who found high correlation between the sudden increase of blood pressure during pregnancy is one of the cause for women developing heart failure, 20 (43.47%) PPCM patients in our study had hypertensive complications throughout pregnancy.

We observed that 18 (39.13%) patients with PPCM were anemic, which is comparable to the findings of research done by Sachdewani et al^[11] who discovered 32.9% anemia.

Lee S et al^[12] reported vital risk factors were older age, preeclampsia, gestational diabetes mellitus, primiparity and multiple pregnancies.

In contrast to Chaitra et al^[13] who reported an ejection fraction of less than 30% in 76.1% of patients, our study 2D ECHO findings showed that 26.08% patients had an ejection fraction below 30%.

Out of 46 patients, 26 (56.52%) had preterm babies, which is in line with research by Bakhta et al^[14] who discovered those with peripartum cardiomyopathy have a greater chance of premature delivery.

We found that 18 (39.13%) babies required NICU admission, 26 (56.5%) had low birth weight and 4 (8.6%) babies died. In a different study done by Sachdewani et al^[11] 28 newborns with fetal growth restriction and 4 neonatal deaths along with 10 stillbirths, while Hasan et al^[15] reported 27 live births and 5 perinatal deaths..

Out of 46 patients 32 (69.56%) required ICU admission, 28 (60.86%) required inotropes, 40 (86.95%) recovered from illness and 6 (13.04%) passed away. According to Hasan et al^[15] descriptive study of 32 patients with PPCM, the most common maternal complication was CCF in 20 (62.57%) patients, while maternal death was seen in 3 cases.

In comparison between two groups of survivors and non-survivors, we found that 37.5% of survivors and 83.33% of non-survivors had hypertension and anemia was reported in 22.22% survivors and 33.33% non survivors. We discovered that in non survivors group 100 % patients have LEVF<30% whereas in survivors only 15 % have LEVF<30%. These findings suggested that out of numerous risk factors, anemia and hypertensive disorders in pregnancy are the two main risk factors associated with mortality in PPCM patients.

Limitation of the study: It is a retrospective study and study population is very less.

CONCLUSION

Despite PPCM is a rare pregnancy problem, if it is not identified and treated early it can be fatal. The condition of the mother has significant impact on the perinatal outcome. Over 50% of the patients ultimately experienced spontaneous preterm birth. The prognosis would be improved by early detection and careful surveillance of the patients who fall into the risk category. Advanced maternal age, multiparity, hypertensive disorders of pregnancy and anemia are recognised as significant risk factors for the emergence of PPCM. Further study is needed to understand pathophysiology and outcome in better way.

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