

A Clinical Study on Peripartum Cardiomyopathy at Tertiary Care Centre

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Abstract: **Background:** Cardiac disease complicating pregnancy is of importance since ages. Maternal death attributable to cardiovascular diseases occupies significant place among developed and in developing countries. In India, cardiac disease complicates 2 % of all pregnancies and contributes to one - fifth of all maternal deaths. **1. Peripartum Cardiomyopathy (PPCM)** is a unique form of nonischemic dilated cardiomyopathy of unknown etiology- defined as cardiac failure in the last month of pregnancy or within 5 months after delivery. Aim of this study is to determine the age group, period of presentation (antenatal / postpartum), mode of presentation, associated comorbidities, maternal outcome of PPCM. **Methods:** This study is a prospective observational study conducted on antenatal, postpartum patients admitted in the Department of Obstetrics and Gynaecology, GRMH attached to Government Thanjavur Medical College over a period of 18 months from January 2021 to August 2022. Women who were not a known heart disease till the date of admission were observed for a period of 18 months and the one with newly established heart disease in their peripartum period were picked up and analysed. **Results:** A total of 28 cases of PPCM are noted in the study. The incidence of PPCM found to be 0.093 % among the total mothers admitted over a period of eighteen months. The maximum number of patients are in the age group of 20- 25 years (12 /28patients). 10 out of 28 patients presented in their antenatal period, 18 patients presented postpartum. 6 patients had associated anemia, 8 patients had associated severe preeclampsia, 2 patients had associated gestational hypertension, 14 were in ionotropic supports in this study, 2 cases had history of PPCM in previous pregnancies. Among the 28 cases, 4 maternal deaths were reported. **Conclusion:** Careful assessment of risk factors, eliciting detailed history about any prior cardiac events and followup ECHOs in previous history of PPCM, careful monitoring of patients with risk factors for ppcm could help us to anticipate and early diagnosis. These patients needs highrisk antenatal care in future pregnancies.

Keywords: Cardiac diseases, Peripartum Cardiomyopathy, Maternal Mortality

1. Introduction

Pregnancy causes significant alteration in the cardiovascular system. All of them may not always accommodate these changes. Patients with known cardiac disease may show new cardiac symptoms/ exaggerated known symptoms. But some with certain precipitating factor may develop ventricular dysfunction leads to cardiogenic heart failure. At present, cardiac disease complicates 0.2- 4 % of all pregnancies in western world ¹. The raising prevalence of cardiovascular disease is likely multifactorial, most of the times associated with obesity, hypertension, diabetes, anemia. Rheumatic valvular heart disease is the most common heart disease in developing countries 56 to 89 % of all cardiovascular diseases. Though Peripartum cardiomyopathy is uncommon among cardiac diseases in both developing and developed countries, it is the most frequent cause of severe complications and the one which leads to maternal mortality. Though the knowledge about its morbidity and mortality is known, the aetiology remains unknown and is subject to much speculation².

PPCM is a form of nonischemic dilated cardiomyopathy with its unique association with pregnancy. PPCM is a diagnosis of exclusion. Diagnostic criteria for PPCM are as follows³,

- Development of heart disease in the last month of pregnancy or upto 5 months postpartum.
- No recognisable heart disease before last month of pregnancy.
- The absence of an identifiable cause for the cardiac failure.
- Left ventricular systolic dysfunction demonstrated by ECHO criteria- Ejection fraction < 45% and/or Fractional shortening < 30%, End-diastolic dimension > 2.7 cm/m²

The incidence of PPCM shows significant variation with the ethnic and regional background of women. The incidence of PPCM is found higher in Africans and Asian - African

population with an incidence of 1:100 in Nigeria^{4,5}. In Caucasian population, the incidence ranges from 1:1000 in Germany to 1: 10149 in Denmark^{6,7}.

The etiology remains unknown, predisposed causes are viral myocarditis, hormonal interactions, abnormal immune response to pregnancy, aberrant response to hemodynamic burden of pregnancy, inflammation, malnutrition, oxidative stress. PPCM shows coexistence with hypertensive disorders of pregnancy, multifetal gestation, obesity, black race, anemia.

The pathophysiology of ppcm is still largely unknown, several theories have been proposed. Some of them were autoimmune process, inflammatory process, viral infections, low selenium levels. In recent years, shift of angiogenic balance towards anti- angiogenic environment is most accepted theory. among these anti - angiogenic factors, the cleaved N terminal 16 kDa prolactin fragment and sFlt-1 are considered crucial.

Aim and Objectives

- 1) To study the Epidemiology of PPCM
- 2) Age distribution
- 3) Time of presentation (antenatal period/ postpartum period)
- 4) Other coexisting comorbidities and its association.
- 5) Maternal outcome
- 6) Role of Bromocriptine

2. Materials and Methodology

This study is a prospective observational study conducted on antenatal, postnatal, post caesarean women admitted at GRMH attached to Thanjavur Medical College, Thanjavur over a period of 18 months (January 2021 to August 2022).

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Inclusion Criteria

- All women who developed Left ventricular systolic dysfunction in the last month of pregnancy or within 5 months postpartum.

Exclusion Criteria

- Patients who were known heart disease prior to pregnancy.
- Patients with newly diagnosed valvular heart disease, newly diagnosed underlying congenital heart disease, cardiac complications of known etiology.

Methodology:

Patients details, detailed clinical history regarding number of pregnancies, prior cardiac events, precipitating factors, associated risk factors and Investigations such as Electrocardiography, Echocardiography, basic blood investigations were collected from hospital records on daily basis at GRMH, Thanjavur Medical College over a period of 18 months from January 2021 to August 2022. Individual management and maternal outcome were observed.

3. Results and Analysis

- A total of 28 cases of PPCM noted in this study over a period of 18 months satisfying the inclusion criteria, and the incidence of PPCM found to be 0.093%.
- Among 28 cases of PPCM, (42.8 %) 12 cases were in the age group of 20-25 years.

Age distribution of PPCM

S.no	Age group	Number of cases	Percentage
1	20 - 25 years	12	42.8 %
2	26- 30 years	9	32.1 %
3	>30 years	7	25 %

- Among 28 cases of PPCM, 18 patients (64.2%) presented in first month of postpartum period, 10 patients (35.7%) reported in the antenatal period.
- Among 28 cases of PPCM reported, comorbidities associated are as follows:

S.no	Associated comorbidities	Number of cases (percentage)
1	Severe Preeclampsia	8 (28.5%)
2	Gestational Hypertension	2 (7.14%)
3	Anemia	6 (21.42%)
4	Previous h/o PPCM	2 (7.14%)
5	Ionotropic supports	14 (50%)
6	Congenital moebius syndrome	1 (3.5%)

S.no	Name of the study	Severe preeclampsia and other hypertensive disorders	Anemia	Twin pregnancy	Previous h/o PPCM
1	In this study	35.7%	21.42%	0	7.14 %
2.	Desai et al ¹³	78%	Not studied	Not studied	Not studied
	Kamilu M karate et al ⁹	37.7%	Not studied	14%	Not studied
	Kao et al ¹⁴	30.3%	34%	11.2%	Not studied

Maternal Outcomes:

Among these 28 patients, 14 (50%) patients were on ionotropic supports with ICU care, 8 (25%) were on ventilator support and 4(12.5%) patients died of the disease. All the 28 patients received bromocriptine as a part of management.

- Among these 28 cases of PPCM, 10 cases were on ventilatory support at the time of diagnosis, all the cases were given bromocriptine, 14 patients were on ionotropic supports, 4 maternal deaths reported, 24 patients discharged.

4. Discussion

The incidence of PPCM in our study is 0.093%. In the study conducted by Toshiaki Isogaie et al 2019⁸, the incidence of PPCM was found to be 0.98% in Nigerian population compared to Japan population which was found to be 0.0064%. They concluded that there is increased risk of ppcm among black race and this incidence differs by the race. In another study conducted by Kamilu M karate et al 2020⁹, the incidence of PPCM was more in North West zone of Nigeria showing that the socio- demographical factors plays a role. This is consistent with the literature.

S.no	Name of the study	Incidence of PPCM
1	In our study	0.093%
2	Toshiaki Isogaie et al 2019	0.98% - Nigeria 0.0064% - Japan
3	Kamilu M karate et al 2020	0.96 % Nigerian population.

In our study, among the total 28 cases of PPCM reported, 42.8% were between age 20-25 years, 32.1 % were aged between 26-30 years, 25 % were above 30 years. In a study conducted by Shish Mohammad Sarkar et al 2021¹⁰, about 60 % of the population were above 30 years - major population and the mean age of distribution was found to be 28 years. In contrary, in a study conducted by mariam sako et al 2021¹¹, the most represented group was between 16 -20 years (32.5%). These results do not allow us to define a preferred age of peri partum heart disease.

Among 28 cases of PPCM, 18 patients (64.2%) presented in first month of postpartum period, 10 patients (35.7%) reported in the antenatal period. This result is in consistent with a study conducted by Byomesh Tripathi et al 2019¹², where the postpartum presentation of PPCM was the most common.

In our study, 8 out of 28 patients had severe preeclampsia, 2 had gestational hypertension, 6 had anemia, 2 had previous history of PPCM. These associations are compared with a study conducted by Desai et al¹³, Kamilu M karate et al⁹, Kao et al¹⁴. In all the studies, hypertensive disorders of pregnancy play important role as a risk factor for PPCM.

Most of the patients showed clinical improvements after additional of bromocriptine.

5. Conclusion

The incidence of PPCM markedly varies among countries and areas. Race is one cause of these differences, and from the studies it has been found that black race is a major risk factor for PPCM. The mean age of presentation of PPCM is inconclusive as there are great variations in age distribution among the studies compared. The association of PPCM with preclampsia is once again proven in our study. The use of bromocriptine in the management of acute PPCM have been introduced recently^{15,16,17}. Diuretics are recommended in case of fluid overload. Fortunately, recovery of left ventricular function is markedly higher in PPCM than in other dilated cardiomyopathies. Approximately 50% of patients will recover to normal ejection fraction within 6 months to 5 years. All the 28 cases in this study have received bromocriptine and anticoagulants, only 4 maternal deaths were reported and all the other 28 were discharged after stabilization. This again signifies the importance of supportive care which decides the overall survival.

Conflict of interest- Nil

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