Incidence and outcome of peripartum cardiomyopathy in a tertiary care hospital

Spandana K[1], Ravinder Reddy Kasturi[2], Mudgalkar N[3], Srinivas Kumar A[4], Vivekanada A[5]

1. senior Resident, Department of Medicine

2. Consultant cardiologist and Head of Department of Medicine

3. Consultant Cardiac Anesthesiologist

4. Consultant cardiologist, Director and Chief of cardiac sciences, Apollo Hospital, Hyderabad

5. Head of obstetrics and gynecology, Dean Prathima Hospital,Karimnagar

Address for correspondence: Department of Medicine, Prathima Institute of Medical Sciences,Nagnur road,Karimnagar

ABSTRACT

AIMS AND OBJECTIVES OF THE STUDY:

To study the incidence, assess the risk factors and study the clinical profile of patients with peripartum cardiomyopathy and the outcome of peripartum cardiomyopathy.

Methods :

A prospective study and retrospective study of PPCM was conducted at Prathima Institute of Medical Sciences, Karimnagar, Telangana, India over a period of 4 years. Prospective data was collected during the period of January, 2017 to October, 2018. Retrospective data was collected from hospital records from January, 2015 to December, 2016. A total of 92 patients were identified during the study period that fulfilled the inclusion criteria.

Results: Overall incidence of PPCM in our institution was 9 per 1000 deliveries. Patient age range was between 20 and 35 years. Mean age was 26 ± 4 years. Out of 92 cases, 40 cases were in the age group of 20-25yrs, 32 in 25-30yrs and 20 in 30-35yrs age group. 72 patients were of =30years of age and 20 were of advanced maternal age (>30 years). 70 cases were primiparous (76.08%) and 22 were multiparous (23.91%). Two patients had twin foetuses. 37 patients (40.21%) developed PPCM during pregnancy and 55 patients (59.78%) during postpartum period. There were 12 (13.04%) maternal deaths. All the 12 cases were aged less than 30 years and had severe LV dysfunction.

Conclusion: Incidence of PPCM is not uncommon in southern India. The incidence was 9 per 1000 deliveries in the study. PPCM is not the disease of advanced maternal age and multiparity as majority of the cases in the study were of age <30years and primiparous.

Keywords: peripartum cardiomyopathy,risk factors,outcome

INTRODUCTION

Peripartum cardiomyopathy is a potentially life-threatening form of heart failure affecting women late in pregnancy or in the early puerperium. There is no single explanation of the pathogenesis. It is a diagnosis of exclusion. A high index of suspicion is required for the diagnosis, as shortness of breath and pedal oedema are common in the peripartum period. PPCM is associated with a high morbidity and mortality, but also with the possibility of full recovery. The precise incidence in India is not known, an incidence of one case per 1374 live births has been reported from a tertiary care hospital from South India.1 This study aims to determine the incidence and prognosis of PPCM.

PATIENTS AND METHODS

A prospective study and retrospective study of PPCM was conducted at Prathima Institute of Medical Sciences, Karimnagar, Telangana, India over a period of 4 years. Prospective data was collected during the period of January, 2017 to October, 2018. Retrospective data was collected from hospital records from January, 2015 to December, 2016. A total of 67 patients were identified during the study period that fulfilled the inclusion criteria. Inclusion criteria were Patients with any parity and age, who are in their peripartum period i.e. One month before delivery or within five months of delivery, Patients presenting with signs and symptoms of heart failure, Documented systolic dysfunction with echocardiographic finding of Ejection fraction of <45% and or Fractional shortening <30% absence of another identifiable cause for the HF. Exclusion criteria were patients with pre-existing cardiomyopathy, pre-existing acquired or congenital valvular heart disease, pre-existing undetected congenital heart disease, diastolic heart failure due to hypertensive heart disease, myocardial infarction secondary to coronary artery dissection, coronary artery disease, coronary embolus/ thrombosis, and coronary artery spasm, pulmonary embolism / amniotic fluid embolism, COPD, severe anemia (hemoglobin less than 10 g/dl), pulmonary artery hypertension, thyroid disorders, septicaemia and patients with normal echocardiography.

All patients underwent a detailed history, clinical examination, routine investigations, chest X-ray, electrocardiography, M-mode, 2-D and colour Doppler echocardiography. All patients were treated with ionotropic support, ß-blockers, diuretics, nitrates and ACE inhibitors. Risk factors and complications were analysed. Each patient was followed up for a period of 1 year.

Statistical analysis: Retrospective data of old cases were collected from hospital records. Statistical analysis was done using SPSS version 19 – Student unpaired T-Test.

RESULTS

A total number of 9220 cases were delivered during the study period. 92 PPCM cases were identified with an incidence of 9 per 1000 deliveries. The mean age at presentation was 26 ± 4 years. 72 patients were of =30years of age and 22 were of advanced maternal age (>30 years). Statistical significance shown in the table no.1

Table 1: Maternal age and its statistical significance

	Less than 30 years	More than 30 years	T test	P value	Significance
Mean Age	24.36	32.29	15.3030	Less than 0.001	Highly significant
Standard Deviation	2.65	1.38			
Number of cases	72	30			

70 cases were primiparous (76.08%) and 22were multiparous (23.91%)

Table 2 Age distribution and parity

Age group	primiparous	multiparous
20-25	41	4
26-30	22	5
31-35	7	13

Two patients had twin foetuses. 70 cases were primiparous (76.08%) and 22 were multiparous (23.91%).Two patients had twin foetuses. 37 patients (40.21%) developed PPCM during pregnancy and 55 patients (59.78%) during postpartum period. 12 had pre-eclampsia and 2 had eclampsia.

Majority of the patients i.e. 72 cases (78.26%) had severe left ventricular dysfunction (EF =30%) and 15 (16.30%) had moderate left ventricular dysfunction and 5(5.43%) had mild LV dysfunction.

71 patients had normal delivery and 21 patients underwent caesarean section. Indication for caesarean section in all the cases was an obstetric cause (Breech presentation, cephalopelvic disproportion, and severe oligohydramnios). There were two intrauterine fetal deaths and 1 neonatal death. Two cases developed CVA and one developed CSVT and two developed pneumonia. Two were complicated with Torsades de pointes. There were 12 maternal deaths (13.04%).

Mean EF (with SD) in the patients who died of PPCM was 26.67±4.08% and among the survivors, it was 30.61±6.12% which was statistically significant (<0.05) (Table no.3)

Table 3 Mortality and severity of LV dysfunction

	Dead	survived	T test	P value	Significance
Number of cases	12	80	2.1404	<0.05	Significant
Mean EF	26.67	30.61			
SD	4.08	6.12			

Table 4: parity and severity of LV dysfunction- unpaired T test

	primipara	multipara	T test	P value	Significance
Number of cases	70	22	0.84419	>0.05	Not Significant
Mean EF	29.91	31.83			
SD	5.73	7.41			

When parity was assessed, most of the patients were primipara, though it was not statistically significant as shown in Table 4

Table 5: maternal age and severity of LV dysfunction- Unpaired T test

	<30 years	>30 years	T test	P value	Significance
Number of cases	72	20	0.06	>0.05	Not Significant
Mean EF	30.28	30.14			
Standard deviation	5.58	7.18			

When maternal age and severity of LV dysfunction was assessed, mean Ejection fraction was not different in both the groups and the result was not statistically significant.

DISCUSSION

PPCM is one of the causes of pregnancy-associated heart failure. It typically develops during the last month of, and up to 5 months after, pregnancy in women without known cardiovascular disease. A high index of suspicion is required for the diagnosis, as shortness of breath and pedal oedema are common in the peripartum period. Although the disease is relatively uncommon, its incidence is increasing. There is very little literature from India

The incidence of PPCM varies extensively across geographic regions of world from 1:15,000 to1:100 deliveries[2]. The precise incidence in India is not known. There are major discrepancies in the reported incidence and mortality rates of PPCM. Such discrepancies most likely arise from the lack of prospective PPCM registries worldwide, and as a result, optimal treatment strategies and definitive predictors of left ventricular recovery associated with PPCM remain unknown and as peripartum cardiomyopathy seems to affect women in different parts of the world with considerable differences in clinical presentation . The incidence in the present study was 9 cases per 1000 deliveries. Vinay et al.[1] (a study conducted in a tertiary hospital in South India) reported an incidence of 1 case per 12374 deliveries. Joshi AV et al[3] reported 22 per 10279 deliveries in a study conducted in Maharashtra. Fett et al.[4] reported a higher incidence of one case per 300 live births from Haiti. Isezuo et al.[5] reported incidence rate of one case per 102 deliveries in Sokoto, northwest Nigeria.

In this study, 37 patients (40.21%) developed PPCM during pregnancy and 55 patients (59.78%) during postpartum period. Most of the patients developed PPCM in the first month following delivery. Peripartum stress due to altered physiological conditions might be the cause behind PPCM in the early puerperium. In a study by Laghari et al[6] out of 45 cases, 14(31.1%) presented during pregnancy and 31 (68.8%) presented after delivery. Although PPCM is thought to be more prevalent in the upper and lower extremes of childbearing age, and in older women of high parity, it is important to note that 24–37% of cases may occur in young primi gravid patients[7]. Several case series reports from Nigeria, Haiti and South Africa did not show a disproportionate role for older age and multiparity in the development of PPCM[7]

Even the present study defies that PPCM is the disease of advanced maternal age and multiparity as majority of the cases in this study were of age less than 30 years and primiparous.

In this study, the mean ejection fraction at the time of presentation was 30.25 ± 6.05. But no association has been found between the parity and the severity of LV dysfunction and also maternal age and the severity of LV dysfunction. (as Shown in tables 4 & 5)

Mortality rate was higher among the patients with severe LV dysfunction, while most of the survivors had mild to moderate LV dysfunction which was statistically significant ($p<0.005$)

In the present study, 12 had pre-eclampsia (13%) and 2 had eclampsia (2.17%). Historically, many PPCM studies purposefully excluded women with Pre-eclampsia or eclampsia to avoid misclassification of Pre-Eclampsia -associated pulmonary oedema as PPCM (the study by Vinay et al.[1]). It is important to appreciate that Pre-eclampsia associated pulmonary edema is a distinct clinical entity that occurs in the presence of high blood pressure and increased cardiac afterload, but unlike PPCM, it occurs despite a normal ejection fraction. Bello et al[8] recommended that women with Pre-Eclampsia not be excluded from future studies of PPCM, in light of their strong association. In a study by Bello et al. , which was a systematic review and meta-analysis, the prevalence of Pree clampsia in PPCM was more than 4 times the average global rate expected in the general population

In the present study, all cases were discharged on oral beta blockers, diuretics and ACE inhibitors. During the follow-up, the drugs were sequentially withdrawn (diuretics, ACE inhibitors followed by beta-blockers) depending on the LV function recovery and symptoms.

Two patients had Torsade's de pointes in the present study. Both patients presented at during postpartum period. One of the patients was on mechanical ventilator support and had recurrent non-sustained polymorphic VT. She was defibrillated twice and was started on amiodarone infusion but the patient did not survive. The other patient was defibrillated once with return of spontaneous circulation and was started on amiodarone.

In the present study, three (4.4%) developed thromboembolic events. Two cases developed CVA and one developed cerebral sinus venous thrombosis. These three cases had severe LV dysfunction. All the patients with an evidence of LV thrombus on echocardiography were treated with Low molecular weight heparin.

In the present study, there were 12 (13.04%) maternal deaths.9 patients were primiparous and three was multiparous. All the 12 cases were aged less than 30 years and had severe LV dysfunction. Mean age of the deceased patients was 25.17 ± 2.23 years. Mean LV Ejection Fraction (EF) among the deceased patients was 26.67 ± 4.08 %. And the mean LV Ejection Fraction (EF) among the survivors was 30.61± 6.12 %.

Although data regarding the risks of subsequent pregnancy in women with PPCM remains incomplete, the available data reported above indicate that PPCM patients are at increased risk for worsening heart failure and death during subsequent pregnancy. Patients who may be at highest risk that is, those whose LVEF was <25% at diagnosis or whose LVEF has not normalised should be strongly advised to avoid subsequent pregnancy. In the present study, during follow-up one case was found to have uneventful subsequent pregnancy without recurrence of PPCM. She had moderate LV dysfunction at the time of presentation during first pregnancy and had complete recovery of LV function at the end of 3 months.

CONCLUSION

To conclude, PPCM is not uncommon in India. It is a diagnosis of exclusion. The incidence was 9 per 1000 deliveries in the study. Present study defies that PPCM is the disease of advanced maternal age and multiparty as majority of the cases in the study were of age <30years and primiparous.There is no single explanation for the pathogenesis of PPCM that is relevant for all women. Early diagnosis and treatment lead to good maternal and foetal outcome.

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How to cite this article : Spandana K, Kasturi RR, Mudgalkar N, Srinivas Kumar A, Vivekanada A . Incidence and outcome of peripartum cardiomyopathy in a tertiary care hospital. Perspectives in Medical Research 2019; 7(2):18-21

Sources of Support: Nil,Conflict of interest:None declared