

CLINICAL CHARACTERISTICS, ECHOCARDIOGRAPHIC PROFILE AND OUTCOME OF PERIPARTUM CARDIOMYOPATHY AT BPKIHS, A TERTIARY CARE HOSPITAL IN NEPAL

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ABSTRACT

Background: Peripartum Cardiomyopathy (PPCM) is a pregnancy associated myocardial disease. It is a rare disease with unknown etiology. Certain characteristics are risk factors for the disease. Recognition of its risk factors is important for prevention and treatment.

Objectives: To determine clinical characteristics, echocardiographic profile and in hospital outcome of patients with peripartum cardiomyopathy.

Methods: This is a descriptive retrospective study. All patients files with the diagnosis of peripartum cardiomyopathy from 1st November 2009 to 30th December 2014 were studied. Demographic data, echocardiogram and in hospital outcome of patients were reviewed.

Results: Sixty five patients were diagnosed with PPCM during the study period. Mean age was 28 ± 6.5 yrs. Fifty eight patients (89%) were multigravida and only seven (11%) were primigravida. Only two patients had twin pregnancy. Forty four (68%) presented after delivery and twenty one (32%) presented during pregnancy. Most of the patients 57 (88%) were in NYHA class III and IV. Fifty seven (88%) patients had moderate to severe Left ventricle systolic dysfunction. Five (8%) had preeclampsia, four (6%) had eclampsia and two developed gestational hypertension. Two patients were diabetic. None of the multiparous patients had history of PPCM. No maternal mortality was there. Fetal outcomes were good with all resulting live births and most were appropriate for gestational age.

Conclusions: Patients had varied age and most were multiparous and multigravida. Most of them presented after delivery and had moderate to severe left ventricle systolic dysfunction. In hospital maternal and fetal outcomes were good.

Keywords: Peripartum cardiomyopathy, Left ventricular systolic dysfunction

INTRODUCTION

Peripartum cardiomyopathy (PPCM) is a pregnancy associated myocardial disease, reported to occur in different parts of the world.¹ It is a rare disease entity of unknown aetiology. High rates of mortality or poor overall clinical outcome are reported in woman with this condition.^{2,3} Peripartum cardiomyopathy was initially described in 1849.⁴ Other terms used for this condition are toxic postpartum heart failure, Zaria syndrome, Meadows syndrome and postpartum myocardiosis. In 1971, Demakis et al. published data on 27 patients with pregnancy associated cardiomyopathy who presented in the peripartum period and named the term peripartum cardiomyopathy.⁵ Following the recommendations

of workshop committee on PPCM⁶ that echocardiographic features of the left ventricular dysfunction should be incorporated to diagnose PPCM, the definition of PPCM was modified which now includes four criteria, three clinical and one echocardiographic : 1) Development of heart failure in the last month of pregnancy or within five months postpartum; 2) Absence of an identifiable cause for the cardiac failure; 3) Absence of recognizable heart disease prior to the last month of pregnancy; 4) Demonstrable echocardiographic proof of left ventricular systolic dysfunction. Ejection fraction less than 45%, fractional shortening less than 30% or both. The incidence of PPCM is variable across the different regions of the world. It occurs in 1 case per 6000 live births in Japan, to 1 case per 1000 live births in South Africa, to 1 case per 350-400 live births in Haiti.^{7,8} In Asia, limited data are reported for PPCM in

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countries such as India and Turkey.⁹ Different centres worldwide have reported various risk factors for PPCM such as advanced maternal age, multiparity, multifetal pregnancy, gestational hypertension, use of tocolytic therapy and even socioeconomic status.¹⁰ Despite continuing research, the aetiology of this disease and preventive measures remain elusive. In our country there is paucity of data on peripartum cardiomyopathy. The purpose of this study is to describe clinical characteristics and inhospital outcome of patients admitted at BPKIHS with this diagnosis.

Table 1 Demographic characteristic of patients

Number of cases (n)	n (65)
Age range (years)	20 – 42
Mean age (years)	28 ± 6.5
Primigravida n (%)	7 (11%)
Multigravida n (%)	58 (89%)
Primipara n (%)	18 (28%)
Multipara n (%)	47 (72%)
Twin pregnancy n (%)	2 (3%)
Presentation during pregnancy n (%)	21 (32%)
Presentation after delivery n (%)	44 (68%)
Presentation (days after delivery)	1 – 35
During presentation NYHA Class II n (%)	8 (12%)
During presentation NYHA Class III & IV n (%)	57 (88%)
Cesarean section n (%)	27 (42%)
Vaginal delivery n (%)	38 (58%)
During discharge NYHA Class II n (%)	28 (43%)
During discharge NYHA Class III n (%)	37 (57%)

MATERIALS AND METHODS

This was a descriptive study which was done at BPKIHS. All patients files with the diagnosis of peripartum cardiomyopathy from 1st November 2009 to 30th December 2014 were reviewed. The study was conducted after the ethical approval from the Institutional ethics committee. In those patients files in which diagnosis of peripartum cardiomyopathy was made but did not fulfil criteria as given by the National Heart, Lung, and Blood Institute and Office of Rare Diseases (National Institute of Health) workshop recommendation and review⁶ were excluded from

the study. The following demographic data were extracted: age, parity, presence of multifetal pregnancy, presence of coexisting hypertension, and mode of delivery. Diabetes mellitus and hypertension (pre-eclampsia, eclampsia, chronic hypertension) were noted. Functional capacity and echocardiographic parameters were documented and last fetal (age of gestation, live birth, fetal death) and maternal outcomes (mortality, functional capacity on discharge – NYHA functional classification) were recorded. *Statistical Analysis:* Data were entered in MS Excel Work sheet and were analyzed using SPSS 11.5 version. Descriptive statistics were used for the demographics and echocardiographic data.

RESULTS

Sixty five patients of peripartum cardiomyopathy (PPCM) were found through the diagnosis coding system and their files were reviewed. Patients were of a wide range with the youngest mother of 20 years and oldest at 42 years, mean age was 28 ± 6.5 years (Table 1).

Majority of the patients 58 (89%) were multigravida and 47 (72%) were multiparaous. Only two of them had twin pregnancies. Twenty one patients (32%) presented during pregnancy and the remaining 44 (68%) presented after delivery. Presentation after delivery ranged from day one to thirty five days. All patients presented with heart failure symptoms and signs and majority of them (88%) had moderate to severe heart failure (NYHA Class III and IV) symptoms but during discharge most of the patients had improved functional class.

Sixty three (97%) had term deliveries. Fetal outcomes were also good with no mortality. No maternal mortality occurred.

Preeclampsia was present in 5 (8%) of patients and 4 (6%) had eclampsia (Table 2). Two patients had gestational hypertension and two were diabetic. None of them were smoker.

All of the patients had global left ventricular hypokinesia. Majority of the patients 41 (63%) had severe left ventricular systolic dysfunction (EF < 30%). Sixteen (25%) had moderate left ventricular systolic dysfunction (EF = 30-44%) only eight patients had mild dysfunction (EF= 45-54%) and majority had increased left ventricular dimensions. Mean left ventricular end diastolic dimension (LVEDD) was 55 ± 4 mm and mean left ventricular end systolic dimension was (LVESD) was 40 ± 5 mm.

DISCUSSION

Peripartum cardiomyopathy is a rare cause of heart failure that affects women late in pregnancy

or in the early puerperium. This disease has a strong regional distribution being higher in developing countries as compared to developed nations. Reported incidence of PPCM in United States is 1: 3000 – 4000 deliveries while in Nigeri is 1%.^{6,11} There are few literatures from Asian countries. The precise incidence in India is not known. In a study from a tertiary care hospital South India, the incidence has been reported at 1: 1374 live births.¹²

Table 2 Comorbidities in PPCM patients

Comorbidity (n%)	n (65)
Preeclampsia	5 (8%)
Eclampsia	4 (6%)
Gestational Hypertension	2 (3%)
Diabetes mellitus	2 (3%)

Though the disease is present for more than one and a half century, still the etiology of PPCM is obscure and may be multifactorial.⁸ PPCM is more common with high parity and high gravidity. However, PPCM can be seen in primigravidas too, though with much lesser frequency as compared to multigravidas (8% vs 71%).¹³ In this study also 89% of patients were multigravida and 11% were primigravida. Similarly most of the patients were multiparous. The reason for association of multiparity and multigravidity with PPCM remains unclear. Possible reasons for recurrence of PPCM in subsequent pregnancies have been reported. One reported that the risk of irreversible cardiac damage may increase with each subsequent pregnancy.¹⁴ In this study, there was no history of PPCM in any multiparous patients. Possible reason for this may be that during previous pregnancies cardiac changes were already present but did not manifest clinically. Though PPCM has been reported in women older than 30 years^{15,16}, it has occurred increasingly in younger, primigravida women.^{17,18} In this study patients were of a wide age range with the youngest mother of 20 years old and oldest at 42 years old with mean age of 28 ± 6.5 years.

Chronic and gestational hypertension has been considered as a risk factor for PPCM. This study showed preeclampsia in 8% of patients, eclampsia in 6% and gestational hypertension in 3% of patients and so altogether hypertension was present in 17% of patients with PPCM which is lower than 43% reported by Elkayam et al,¹⁵ but higher than the reported rate of 8% to 10% in the overall pregnant population.¹⁹ This difference may be because of ethnic and regional variation.

Twin pregnancy is considered a risk factor for PPCM. This may be due to hematopoietic lineage cell traffic (chimerism) from the fetus to the mother during gestation, which is increased in twin pregnancies.²⁰ In this study, twin pregnancy was there in only 3% of patients. Most of the patients presented in NYHA class III or IV which is similar to the finding in a study done by Ravikishore AG et al.²¹

Twenty seven patients (42%) had undergone caesarean section for maternal indication, mostly because of heart failure. This is similar with the rate of caesarean delivery of 40% in patients with PPCM as reported by Elkayam et al.¹⁵ Preterm delivery is common in PPCM patients.¹⁵ In this study only two patients had preterm delivery in which one had twin pregnancy. There was no maternal mortality in the hospital.

In the study by Witlin et al,²² there were no fetal deaths, but there was an increased incidence of premature and low birthweight infants. The development of PPCM in the mother may be a marker of high risk for the baby. This study also showed no fetal death. Low for gestational age was there in only those infants who delivered preterm.

Majority of the patients had dilated left ventricle and global hypokinesia with moderate to severe left ventricle systolic dysfunction. This was similar to findings in previous studies.^{2,22}

LIMITATION

Outcomes of the mother and fetus were studied only during hospitalization.

CONCLUSIONS

Patients had varied age and most were multiparous and multigravida. Most of them presented after delivery and had moderate to severe left ventricle systolic dysfunction. Inhospital maternal and fetal outcomes were good.

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