

RISK FACTORS ASSOCIATED WITH PERIPARTUM CARDIOMYOPATHY

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SUMMARY

OBJECTIVE: To evaluate the variables implicated as risk factors in the development of peripartum cardiomyopathy in our population.

SETTING: Thirty patients with peripartum cardiomyopathy admitted in Civil Hospital Karachi were included in the study.

METHODS: A detailed relevant history especially regarding risk factors was taken from patient and after that a detailed general physical and systemic examination was done.

Left ventricular functions were assessed using M. Mode targeted 2D ejection fraction, systolic and diastolic segmental wall motion abnormalities were assessed by long and short axis views obtained at Parasternal, subcostal and apical four and two chambers.

Patients having ejection fraction < 40%, Left ventricular end diastolic diameter (LVEDD) >55 mm and Left ventricular end systolic diameter (LVESD) > 35mm were included in the study.

RESULTS: The mean age of the patients was 29.8 (range 19-45). Three patients (10%) had symptoms 1 month prepartum, 25 (83.3%) were presented within 2 month postpartum while 2 patients (6.6%) after 2 months of delivery. Ten patients (33.3%) were smoker, 4 (16.6%) were tobacco eater (but no one had taken alcohol or cocaine), socio-economically all belonged to poor class, 12 patients (40%) were malnourished, 6 (20%) patients were primipara, 8 (26.6%) patients were multipara and 16 (53.3%) patients were grand multipara. Four (13.3%) patients had twin pregnancies, 5 (16.6%) patients had a history of toxemia of pregnancy, 2 (6.6%) had a history of long term tocolysis.

CONCLUSION: In our study the risk factors observed in greater frequency were age > 30 years, poor socio-economic class, malnutrition, smoking and tobacco eating, parity > 6, malnourishment, toxemia of pregnancy, long term tocolysis, blood group B+ve and twin pregnancies.

Key Words: (Peripartum Cardiomyopathy, (PPCM), Pregnancy, Cardiomyopathy, Congestive heart failure).

INTRODUCTION

Peripartum cardiomyopathy (PPCM) is a rare form of congestive heart failure that affects women late in pregnancy. It was first described in 1849¹ although it was not recognized as a distinct clinical entity until the 1930s².

By definition PPCM is defined on the basis of four criteria 3-6.

- * Development of cardiac failure in the last month of pregnancy or with in five months of delivery
- * Absence of an identifiable cause for the cardiac failure.
- * Absence of recognizable heart disease prior to the last month of pregnancy
- * Left ventricular systolic dysfunction

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demonstrated by echocardiographic criteria, such as depressed fractional shortening or ejection fraction.

Some authors have defined the term PPCM as cardiac dilatation and congestive heart failure of unexplained cause that develop during the last trimester of pregnancy or with in six months after delivery.^{7,8}

The true incidence of PPCM is unknown estimates proposed over last several decades range from 1 per 1300 to 1 per 15000 live births⁹⁻¹⁴

The exact data about incidence and prevalence in Pakistan is not available but the disease is not uncommon.

Patient with PPCM usually present with symptoms of cough, dyspnea, orthopnea, paroxysmal nocturnal dyspnea, hemoptysis, pedal edema and fatigue.

The disease has high mortality rate (20-50%),¹⁵ however 35% of the patients are reported to recover their baseline ventricular function with in six months.¹⁶

Although the etiology of PPCM remain unclear, a number of potential risk factors have been proposed such as age greater than 30 years,^{2,3,10,14} multiparity women of African descent,¹⁷ pregnancy with multiple fetuses,¹⁸ toxemia of pregnancy,¹⁹ long term 14 maternal cocaine abuse or selenium deficiency,²⁰⁻²⁴ previous doxorubicin therapy,²⁵ autoimmunity²⁶ and myocarditis.²⁷

Keeping in view the high morbidity and mortality of disease it is important to understand the risk factors related to the disease, therefore this study was conducted to analyze the risk factors related to PPCM, so that patients at high risk can be identified.

PATIENTS AND METHODS

This is a clinical review of 30 cases of PPCM conducted in cardiology, medical and gynecological wards of Civil Hospital Karachi.

Inclusion criteria

All female patients of age >16 years indiscriminate of

race, parity, economical class and geographic area presented with

- * Symptoms of congestive heart failure in one month prepartum or within five months of delivery.
- * No identifiable cause of failure.
- * Absence of recognizable heart disease prior to last month of pregnancy.
- * Echocardiographic evidence of systolic dysfunction
EF < 40%
LVEDD > 55mm
LVESD > 35mm

Exclusion criteria

- * Patients having history of cardiac disease two months prior to delivery.
- * Echocardiographically no evidence of systolic dysfunction.
- * Echocardiographically any evidence of valvular, pericardial or ischemic cause of cardiac failure.
- * Hemoglobin < 7 g%.
- * Total leucocyte count < 4000 or > 140001 cmm

A detailed relevant history specially regarding risk factors like age, parity, pregnancy with multiple fetuses, toxemia of pregnancy, long term tocolytic therapy, maternal cocaine abuse, smoking and malnutrition was taken from patient and a detailed general physical and systemic examination was done.

Height and weight were measured in centimeter and kilogram respectively and Body Mass Index (BMI) was calculated by the following formula:

$$\text{BMI} = \text{weight in kg} / \text{height in cm}^2$$

After history and examination blood CP, ESR, urine DR, blood urea, serum creatinine, serum protein, A/G ratio, ECG, chest x-ray (PA view) and

echocardiography were done and data were recorded on standardized proforma.

Echocardiography

Evaluation of left ventricular function was done using M-mode 2D ejection fraction. Systolic and diastolic, segmental wall motion abnormalities were assessed by long and short axis views obtained at parasternal subcostal and apical four and two chambers.

RESULTS

There were 30 patients who presented with the symptoms of congestive heart failure (Table 1), in the last month of pregnancy or within first five months postpartum. Out of these, 3 patients (10%) had developed symptoms one month prepartum, 25 patients (83.3%) presented within two months of delivery and 2 patients (6.6%) after two months of delivery.

Mean age of patients was 29.8 years with the range of 19 to 45 years.

Mean parity of patients were 5.4 with the range of 1 to 10 while the mean gravida was 6.3 with the range of 1 to 10. (Table 2)

Twenty eight patients (93.3%) were house wives and socioeconomically all patients were belonged to poor class.

Twelve patients (40%) were found to be malnourished.

Ten patients (33.3%) were smoker and 4 patients (13.3%) were tobacco eaters.

Four patients (13.3%) had twin pregnancies, 5 patients (16.6%) had a history of toxemia of pregnancy and two patients (6.6%) had a history of long term tocolysis.

On blood CP mean hemoglobin was 12.8 g% with the range of 8.6 to 14.4 g%.

Mean white blood cell count was 7200/cmm with the range of 5600 to 9800/cmm Four patients (13.3%) had blood group A+ve, 6 patients (20%) had O+ve and 20 patients (66.6%) had B+ve.

Electrocardiography of patients revealed sinus tachycardia in 28 patients (93.3%), non specific ST-T changes in 23 patients (76.6%), criteria for left ventricular hypertrophy were met in 4 patients (13.3%) and left bundle branch block in 2 patients (6.6%).

On chest x-ray all patients had cardiomegaly, 28 patients (93.3%) had pulmonary venous congestion and 4 patients (13.3%) had small pleural effusion.

Echocardiography revealed mean EF 29.6% with range of 23 to 36, mean LVEDD 64.2 mm with the range of 60 to 79, mean LVESD 48.6 mm with the range of 42 to 56 mean LV wall thickness 8.6 mm with the range of 7.6 to 10.8 and septal thickness 9.4 mm with the range of 8.7 to 11.

DISCUSSION

PPCM is a disease of unknown etiology, but there are certain risk factors implicated in causing the disease. This study was conducted to evaluate the risk factors involved in PPCM.

Mean age of patients studied was 29.8 years (range 19-45 years) with most patients being 28-35 years of age. This is consistent with the study done by Silwak et al], which²⁸ shows that women of 29 years with standard deviation of ± 7 years were the victim

Lampert and Lang in 1995 and Whitlin et al²⁹ in 1997 found that the disease involved patients of all ages but is more frequent in women >30 years of age¹².

Observed parity in our patients revealed that patients with multiple pregnancies, parity > 6 were more at risk, this is consistent with other studies by Silwak et al²⁸ in March 2000, Whitlin et al in 1997 and Brown CS et al at which shows that multiparous women are²⁹ more commonly affected. Contrary to these studies, Ford et al in their study found³⁰ that 72% of their cases were primipara.

Time of presentation in our study was, within 2 months of delivery in 25 patients (83.3%), after 2 months of delivery in 2 patients (6.6%) and one month prepartum in 3 patients (10%). This is consistent with the study by Whitlin et al that shows that 20 of their 28 patients presented within 2 months of delivery²⁹.

Review of the personal habits of the subjects revealed that 14 patients were addicted to tobacco. Out of which 10 patients (33.3%) were smokers and 4 patients (13.3%) were tobacco eaters. Lampert and Lang et al in a review article have reported that patients¹⁰ who abuse cocaine are at greater risk for developing PPCM¹⁴. Data is not available regarding the increased risk of PPCM in smokers. 28 patients (93.3%) were housewives, socio-economically all patients belonged to poor class, 12 patients (40%) were found to be malnourished (iron deficiency anemia and low serum albumin and low BMI). Value JC in a review implicate poor nutrition and lack⁴ of prenatal care as a risk factor, Cenac A and associates also implicate nutritional³¹ deficiency as a risk factor. On the contrary most of the later studies had not provided¹⁴ substantiating evidence and disease was found in well nourished subjects.

Five patients (16.6%) in our study had toxemia of pregnancy, while Ford et al in their study reported that 27% of their patients had toxemia of pregnancy³⁰. Arson GAD et al identified multifetal pregnancy as a risk factor for PPCM⁴.

Two patients (6.6%) in our study had a history of long term tocolytic therapy, this is consistent with the study done by Whitlin et al which shows that 2 of their 28 patients had history of long term tocolytic therapy²⁹.

We observed in our study that blood group B+ve was found in 20 patients (66.6%). No data are available to implicate blood group as a risk factor for developing PPCM.

CONCLUSION

The exact etiology of PPCM is not known so treatment is largely supportive. Risk factors in our study were multi parity, advanced age, poor socio-economic class, malnutrition, smoking, tobacco eating, toxemia of pregnancy and long term tocolysis. Majority of these factors are modifiable and should be avoided before planning and during further pregnancy.

It is a small scale study and large scale studies are recommended.

Table-1
Summary of Symptoms and Signs of Presentation

S.NO	SYMPTOMS	NO OF PTS	% OF PTS
(1)	DYSYPNEA NYHA II	04	13.3%
	III	10	33.3%
	IV	16	53.3%
(2)	Orthopnea	26	86.6%
(3)	PND	28	93.3%
(4)	Chest Pain	02	6.6%
(5)	Fatigue	20	66.6%
(6)	Pedal edema.	30	100%
SIGNS			
(1)	Tachycardia	28	93.3%
(2)	Systolic flow murmur	23	76.6%
(3)	Displaced apex beat	20	66.6%
(4)	Raised JVP	26	86.6%
(5)	Hepatomegaly	10	33.3%
(6)	Cyanosis	02	6.6%

Table-2
Parity of the Patients with PPCM

S.. No	Parity	No. of Patients	% of Patients
01	Primipara	06	20%
02	Multipara	08	26.6%
03	Grand Multipara	16	53.3%

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