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ORIGINAL ARTICLE

Peripartum Cardiomyopathy Outcome and its Risk Factors, Clinical and Radiological Findings in Patients Admitted at Gmc Sukkur

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ABSTRACT

Objective: To determine the outcome of peripartum cardiomyopathy and evaluation of the risk factors, clinical and radiological findings in patients admitted at GMC Sukkur.

Material and Methods: This descriptive study was conducted from August 2018 to December 2019 at the Gynecology/Obstetrics Department, and the Cardiology department of Ghulam Muhammad Mahar Medical College, Sukkur. Patients between age of 15 to 50 years, presented with clinical features suggestive of heart failure, either in late pregnancy, i.e. one month pre-partum or within the first five months postpartum, without any identifiable cause of heart failure, were included. Peripartum cardiomyopathy was diagnosed on the basis of signs and symptoms, and confirmed by electrocardiogram, echo and chest X-ray. The collected data were analyzed using SPSS version 26.

Results: A total of 82 patients were studied, their mean age was 31.0±4.15 years. The most common risk factor was multiparty (59.7%), followed by age above 30 (58.5%) years. Hypertension was present in 48.7% participants; diabetes was present in 32.9% participants and maternal mortality was 18.2%. The most common complication was congestive cardiac failure (26.8%), followed by arrhythmias. 18.0% fetus were stillbirth. Neonatal mortality was 5.9% and 42.6% of alive birth required neonatal intensive care unit admission.

Conclusion: Maternal and fetal outcome was observed in the patients of Peripartum cardiomyopathy. Maternal age and multiparty were prominent risk factors for peripartum cardiomyopathy. It is important that efforts should be made to identify the women at risk of peripartum cardiomyopathy early in pregnancy. Multidisciplinary teams should manage pregnant women at risk of peripartum cardiomyopathy.

Keywords: Peripartum Cardiomyopathy, Risk Factors, Maternal Outcome, Fetal Outcome

August 2018 to December 2019. A total of eighty-two women

INTRODUCTION

Peripartum cardiomyopathy (PPCM) is an uncommon condition. It causes systolic dysfunction with dilated cardiac chambers that commonly manifests in either late pregnancy or early postpartum period (first five month)[1].PPCM is limited to pregnant women at any reproductive age, with 71-98% women presenting during their postpartum period[2,3].PPCM affects pregnant healthy females with the lower rate of 0.1 percent of all pregnancies, but the morbidity and mortality rate of 7 to 50%[4,5].Multiple risk factors may be responsible for PPCM, which include aged mothers, nulliparity, multi-parity, pre-eclampsia, and gestational hypertension[6]·The clinical symptoms and presentations are similar to physiological alterations in healthy pregnancy, which hinders in diagnosis of PPCM[7]·The complications of PPCM include systemic thrombo- embolism leading to stroke, pulmonary embolism (PE), acute mesenteric ischemia; congestive cardiac failure (CCF), arrhythmias, and sudden cardiac death.[6] Despite being commonly encountered in clinical settings, there is very limited local data available in Pakistan. In this study, we have assessed the correlation of risk factors in patients diagnosed with peripartum cardiomyopathy, their clinical and radiological findings. In this study, participants were followed for maternal and fetal outcomes.

MATERIAL AND METHODS

This descriptive study was conducted at the Gynecology & Obstetric Department and the Cardiology Department of Ghulam Muhammad Mahar Medical College, Sukkur from

were enrolled via consecutive convenient non-probability sampling. All patients with age of 15 to 50 years presented with clinical features suggestive of heart failure in either late pregnancy, 1 month peripartum or within the first five months postpartum, without any identifiable cause of heart failure heart failure and no evidence of a pre-existing heart disease, idiopathic (no determinable cause). The findings of the echocardiography (LVEDD > 5.7 cm/m^3, M-mode fractional shortening < 30% and LVEF <45%) were included. All patients who do not have medical documents to support their pregnancy, who do not have peripartum cardiomyopathy or cardiogenic shock as defined by the study, and who are unable to give informed consent were excluded. A detailed medical history and clinical examinations were done to assess the risk factors and clinical features. Diagnosis of peripartum cardiomyopathy was based on clinical features, and confirmed by electrocardiogram, echo, and chest X-ray. Patients were managed according to the proposed standard guidelines. All patients were evaluated in terms of risk factors, including diabetes mellitus, hypertensive disorders, obesity, smoking, etc. Participants were followed for pregnancy outcome. The outcome was assessed in terms

of complications and mortality. The discharged patients were followed for the period of minimum 6 months. The collected data were analyzed using SPSS Version 26.0.

RESULTS

Overall, 82 patients were studied and the mean age of these participants was 31.0±4.15 years. The most common risk factor was multiparty (59.7%), followed by age above 30 (58.5%). 48.7% participants were hypertensive and 32.9% were diabetic. The most common clinical presentation was shortness of breath (95.1%), followed by fatigue in 48.7% participants. The most common clinical finding was crepitation (75.6%), followed by S3 heart sound, which was audible in 43.9% participants. Table. 1

Table 1: Clinical Characteristics and risk factors of Participants n=82

Variables		Frequency (%)
Signs and Symptoms	Shortness of Breath	78(95.1%)
	Fatigue	40(48.7%)
	Pedal edema	32(39.0%)
	Palpitation	24(29.2%)
	Chest pain	14(17.0%)
	Dizziness	06 (7.3%)
	Hypotension	06(7.3%)
	RTI	04(4.8%)
	Fever	04(4.8%)
	Crepitation	62(75.6%)
	S3 Heart Sound	36(43.9%)
	Collapse	10(12.1%)
	Wheeze	4(4.8%)
Risk Factors	Multiparity	49(59.7%)
	Age above 30	48(58.5%)
	Hypertension	40(48.7%)
	Diabetes Mellitus	34(41.4%)
	Anaemia	27(32.9%)
	IHD	14(17.0%)
	Obesity	6(7.3%)
	Mitral Regurgitation	4(4.8%)
	Myocardial Infarction	4(4.8%)

RTI= Respiratory tract infection, IHD= ischemic heart disease

In electrocardiogram (ECG), the most common finding was sinus tachycardia (58.5%). Inverted T wave was identified in 46.3%. Echo results showed that all 82 participants had generalized reduced left ventricular function. Ejection fraction was low (25%-29%) in 43.9% participants. Mitral regurgitation was found in 31.7% participants. In chest X-ray, cardiomegaly was found in 70.7% participants. Pulmonary hypertension was found in 14.6% participants. Table. 2

Table 2: Diagnostics findings in participants n=82

Variables		Number (%)
Electrocardiogram	Sinus Tachycardia	48(58.5%)
	Inverted t waves in ECG	38(46.3%)
	Left Ventricular hypertrophy	36(43.9%)
	Loss of R wave in ECG	26(31.7%)
	Atrial Fibrillation	17(20.7%)
	Left Bundle Branch Block	15(18.2%)
	Right Bundle Branch Block	04(4.8%)
Echocardiography	Generalized reduced Left Ventricular function	82(100%)
	Dilatation of all chambers	58(70.7 %)
	Ejection fraction (%)	
	25-29	36(43.9%)
	30-35	25(30.4%)
	36-40	16(19.5%)
	41-45	05(6.09%)
	Mitral Regurgitation	26(31.7 %)
	Tricuspid Regurgitation	18(21.9 %)
Chest X-ray	Cardiomegaly	58(70.7%)
	Hyperaemic Lung fields due to Pulmonary congestion	30(36.5%)
	Pulmonary hypertension	12(14.6%)
	Pleural effusion	11(13.4%)
	Oligemic lung fields due to severe pulmonary hypertension	08(9.7%)

Spontaneous vaginal delivery (SVD) was done in 41.4% cases, lower segment cesarean section in 40.2% and termination of pregnancy was done in 6.0% participants. The maternal mortality rate was 18.2%. The most common complication was congestive cardiac failure (26.8%), followed by arrhythmias (23.1%). 18.0% fetus were stillbirth. Neonatal mortality was 5.9%. 42.6% of alive birth required neonatal intensive care unit admission. Table.3

Table 3: Mode of delivery and feto-maternal outcome n=82

Variables		Number (%)
Mode of delivery	SVD	34(41.4%)
	Assisted Vaginal Delivery	4(4.8%)
	Twin vaginal deliveries	1(1.2%)
	Lower Segment Caesarean Section	33(40.2%)
	Termination of Pregnancy	5(6.0%)
	Miscarriage	4(4.87%)
Maternal outcome	Congestive Cardiac Failure	22(26.8%)
	Arrhythmias	19(23.1%)
	Maternal Death	15(18.2%)
	Thromboembolism	3(3.6 %)
Fetal outcome	Stillbirth	10(16.3.0%)
	Live birth	51(83.6%)
	NICU admission	29(42.6%)
	Neonatal Death	4(5.9%)
	Intrauterine Growth Restriction	28

DISCUSSION

PPCM is a rare life-threatening cardiac disease affecting healthy pregnant women of reproductive age during late pregnancy or more commonly, in the early postpartum period[7].However, timings of the presentation of PPCM are not certain and differ strikingly in different studies[8].Multiple risk factors have been identified including the third decade of age, black women, multiple pregnancies, multiparity, and any hypertensive disorder (pre-eclampsia, gestational HTN, or chronic HTN) that leads to the development of PPCM[7,8].Women with PPCM show clinical features of heart failure including shortness of breath (SOB), palpitations, chest pain, orthopnea, and paroxysmal nocturnal dyspnea (PND). On examination, elevated jugular venous pressure (JVP), wheezing, additional heart sounds, crepitations, and peripheral edema[7,8].Most women presented to the hospital with SOB (95.1%) and fatigue (48.7%) followed by peripheral edema (39%) and palpitations (29.2%). On physical examination, crepitation was found in 75.6% of the

patients, with S3 heart sound present in 43.9% of the PPCM patients in this study.

In this study Majority (54.8%) of subjects were between 31

and 40 years of age and most common risk factors were multiparity (59.7%) followed by age above 30 (58.5%) years. HTN, DM and anemia were found in 48.7%, 41.4%, and 32.9% of the women, respectively.

In South Korean PPCM patients, the main risk factors were older age, preeclampsia, gestational diabetes mellitus, primiparity and multiple pregnancies[9].Chapa et al. on 32 PPCM patients concluded that the commonest sign and symptoms were tachycardia, dyspnea and peripheral edema 62%, 90% or 59%, respectively[10].

Diagnosis is made when clinical/echocardiographic criteria of PPCM is met, which includes the onset of heart failure in the last gestational month or 5 months postpartum, no demonstrable pre-existing heart disorder, cause is idiopathic, and left ventricular systolic dysfunction as shown by ECG criteria[1].ECG findings typically show sinus tachycardia and CXR demonstrate cardiomegaly and pulmonary venous congestion[8].Echocardiography shows dilatation of all chambers to various degrees, left ventricular ejection fraction (LVEF) < 45%, M-mode fractional shortening < 30% and (LVEDD) of >5.5 cm/m[3,11].

This study diagnosed PPCM based on clinical features and confirmed by performing ECG, echo, and chest X-rays. Multiple findings on ECG coexist in the same patients of which most prevalent were sinus tachycardia (58.5%), inverted T waves (46.3%), left ventricular hypertrophy (43.9%), and loss of R waves (31.7%) in our study. On echocardiography, generalized reduced left ventricle (LV) systolic function was present in all patients, 70.7% of the patients had dilatation of all heart chambers and 43.9% of the patients had ejection fraction (EF) between 25 and 29%. CXR demonstrated increased cardiothoracic (CT) ratio in 60.9% and cardiomegaly in 70.7% of the patients. A cross-sectional concluded that dyspnea was a constant feature in all PPMC patients, and chest pain and palpitations were in 63.1% and 42% cases respectively. In the same study, standard ECG recorded a sinus tachycardia in 68.4%, a cavitary hypertrophy in 78.8%, and disorders of repolarization in 47.3% of the cases. Echocardiography noted cavitary dilatation in 84.2% of the cases and alteration of the left ventricular systolic function with an average EF of 29.7+/- 10.3% [12]. Chapa et al. reported that the mean fractional shortening of their entire study group was 17.3±7.0, with a mean LVEDD of 6.4 ± 0.8 cm in their study[10].PPCM is a major concern among healthy pregnant women of reproductive age, with morbidity and mortality rates reaching as high as 50%[4,5,9].PPCM has devastating outcomes for both fetus and the mother. Maternal complications of PPCM include systemic thromboembolism leading to stroke, pulmonary embolism (PE), acute mesenteric ischemia; CCF, arrhythmias, and sudden cardiac death[7].

In this study, CCF, arrhythmias, and thromboembolism complications were seen in 26.8%, 23.1%, and 3.6% of the patients, respectively, and maternal mortality was 18.2%. Regarding fetal outcomes, our study observed10 stillbirths, and among 51 live births, 4 neonatal deaths and 28 infants with intra-uterine growth restrictions (IUGR) were reported. Hasan et al. in their descriptive study on 32 PPCM patients reported that the main maternal complication was CCF in 20 (62.57) patients, maternal death was observed in 3 patients. About 27 live births, and 5 perinatal deaths were also recorded in the same study.[13] Cunningham FG et al. found mortality rates between 3-40% across various geographic locations.[14] PPCM is treated with neuro-hormonal antagonists that includes angiotensin-converting enzyme (ACE) inhibitor inhibitors or angiotensin receptor blockers

(ARBs). Antiarrhythmic and Anticoagulants can also be used to treat and prevent complications of PPCM. In individuals having PPCM and significant LV dysfunction, inotropes, LV and biventricular assist devices, intra-aortic balloon pumps and extra-corporeal membrane oxygenation must be considered. Some PPCM patients require transplantation and mechanically assisted circulatory support.[8] Additional research regarding the etiology, appropriate treatment, which includes the use of bromocriptine, long-term outcomes, and treatment duration after recovery are required. to recognize and treat PPCM patients in early stages, and prevent the development of complications to reduce morbidity and mortality in mothers and their babies.

CONCLUSION

The maternal and fetal adverse outcome was observed to the highly frequent among patients of Peripartum cardiomyopathy. Maternal age, anemia and multiparty were prominent risk factors for peripartum cardiomyopathy. Efforts should be made to identify pregnant women at risk of peripartum cardiomyopathy early in pregnancy. Multidisciplinary teams should manage pregnant women at risk of peripartum cardiomyopathy.

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