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# Peripartum Cardiomyopathy in a 32 Years Old Saudi Female Complicated with Acute Ischaemic Stroke: Case Report

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**Abstract** **Background:** Peripartum cardiomyopathy (PPCM) is an idiopathic cardiomyopathy presenting with heart failure secondary to left ventricular systolic dysfunction towards the end of the pregnancy, or within five months following postpartum, where no other cause for heart failure was found. PPCM is an uncommon but potentially catastrophic to maternal health, and is an important cause of maternal morbidity and mortality, it accounts for up to 11% of maternal deaths. Incidence of PPCM ranges from 1 in 1300 to 1 in 15,000 pregnancies. About half of all women will have full myocardial recovery within 6 months of diagnosis, but complications such as severe heart failure, thromboembolism or death are not rare. Patients with peripartum cardiomyopathy often present with symptoms and signs of heart failure. Criteria for diagnosis of PPCM, include heart failure that presents with reduced left ventricular function, symptoms and signs of heart failure either late in pregnancy or early in the postpartum period. Recurrence in subsequent pregnancies may occur if left ventricular function is not completely recovered. **Case report:** We report a case of a 32-year-old patient, diagnosed with a peripartum cardiomyopathy in the postpartum period, when she had symptoms of heart failure in the third trimester but she did not seek medical advice till 3 months after delivery, and then she developed acute ischemic stroke. The echocardiogram reported heart failure, left ventricular thrombus and a ventricular failure with an ejection fraction <40%. We could not identify any other cause to justify heart failure nor any other cause for the ischaemic stroke. Multidisciplinary management was administered successfully. **Conclusion:** The presented case indicated that important complications, such as congestive heart failure and intraventricular thrombus are associated with peripartum cardiomyopathy. Because these complications are risk factors for developing a thromboembolic event, such as acute ischaemic stroke which occurred in this reported case, timely and accurate identification of these complications is critical to achieving optimal clinical outcomes in patients with peripartum cardiomyopathy.

**Keywords** Peripartum cardiomyopathy, Heart failure, Acute ischemic stroke

## 1. Introduction

Peripartum cardiomyopathy or cardiomyopathy associated with pregnancy, is a rare cause of heart failure, it affects pregnant or puerperal women in the first 5 months. Although the first case was reported in 1849, it was not recognized until 1930. In 2010 the European Society of Cardiology Working Group on peripartum cardiomyopathy, defined this pathology as an idiopathic cardiomyopathy that affects pregnant women between the third trimester and five months after delivery. It is characterized by a left ventricular failure with an ejection fraction of ≤45% and an end-diastolic dimension ≥2.7 cm/m2, in absence of an identifiable cause of heart failure [1]. Risk factors for PPCM, include advanced maternal age, multiparity, African descent, multiple pregnancy, and long-term tocolysis [2]. It is common in some countries like Nigeria and rare in others like Japan. The pathogenesis of PPM is is poorly understood but it could be related to inflammatory or immune processes. Clinical presentation includes usual symptoms and signs of heart failure, and unusual presentations relating to thromboembolism. PPCM should be considered in any peripartum patient with unexplained heart failure [3]. About half of all patients with PPCM will have full myocardial recovery within 6 months of diagnosis. Adverse outcomes

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depend on functional status at baseline, severity of systolic dysfunction or outflow tract gradient, or history of prior cardiac event such as arrhythmia or stroke. Brain natriuretic peptide (BNP) level can be used to risk stratify women for adverse events [4]. Dilated cardiomyopathy (DCM) is a known cause of ischemia stroke, 7.1% of patients with DCM had experienced a stroke [5]. Treatment for chronic heart failure from PPCM are similar to those patients with nonischemic cardiomyopathy from other causes, however novel therapies may include bromocriptine, pentoxifylline or other potential therapies influencing the immune system. If implantable defibrillators, left ventricular assist devices and cardiac transplant are used in patients with PPCM which is rare, the prognosis, is better than other forms of nonischemic cardiomyopathy [6]. PPCM has the same symptoms, histopathology and treatment as dilated cardiomyopathy (DCM), but it has a better outcome with a high rate of spontaneous recovery of left-ventricular size and function, sometimes PPCM may not be detected, because other pregnancy related factors have similar clinical features [7]. The diagnosis of peripartum cardiomyopathy is mainly clinical after all other causes of heart failure are excluded. Echocardiography is used to confirm diagnosis. Echocardiography should be done for early diagnosis and correct treatment for heart failure for any pregnant lady with unexplained features of heart failure [8] The prognosis of peripartum cardiomyopathy depends on recovery of ventricular function. If left ventricular dysfunction is persistent PPCM may occur in subsequent pregnancies [2].

## 2. Case Presentation

A 32 years old Saudi female patient was brought to our emergency department in King Fahad hospital with a history of sudden onset right side weakness and slurred speech with no history of headache, seizure, abnormal movement or loss of consciousness. She had been recently diagnosed as a case of peripartum cardiomyopathy in a cardiac centre where she was admitted there for 11 days because of symptoms of heart failure (progressive shortness of breath, palpitations, easy fatigability and lower limbs swelling). She had these symptoms for 4 months, since she was pregnant until her delivery three months ago. She is para 5. In her last pregnancy she did not follow up with any doctor and did not seek any medical advice, even when she started to have the above symptoms. She had prolonged vaginal delivery with prolonged postpartum bleeding. The symptoms continued and became progressive for three months after delivery. Her background medical history was not significant, she was not known diabetic or hypertensive, had no history of heart disease and all previous pregnancies were uncomplicated with normal vaginal deliveries. When patient developed fever and her shortness of breath increased and had orthopnoea, she sought medical advice and was transferred to specialized cardiac centre, where she was diagnosed to have heart failure secondary to peripartum cardiomyopathy by echocardiography which showed dilated left ventricle with ejection fraction of 20-25% with moderate mitral and tricuspid regurgitation. She was started on anti-failure treatment (Furosemide diuretics, angiotensin receptor blockers, B-blockers and potassium sparing diuretics). She stayed in the cardiac centre for 11 days where her symptoms improved and was discharged on the above medications. Three days after discharge she had neurological symptoms suggestive of cerebrovascular accident. When she was in ER, she was fully conscious, and all vital signs were within normal. She had facial asymmetry and right side hemiparesis with hypotonia and power grade 1/5 in the right upper and lower limbs and absent tendon reflexes. Planter reflex was positive. Cardiovascular examination revealed displaced apex beat with pansystolic murmur radiating to the axilla. Chest and abdominal examination were unremarkable. She had bilateral lower limb pitting edema. Initial laboratory workup was unremarkable. Computed tomography (CT) of the brain was done in ER and was normal. Magnetic resonance imaging (MRI) brain was done and showed acute infarction along with middle cerebral artery (MCA) territory and acute infarction focus within left cerebellum. Magnetic resonance angiography (MRA) of the brain showed no evidence of significant arterial stenosis, occlusion or aneurysmal dilatation or arteriovenous (AV) malformations. Echocardiography was done and showed dilated left ventricle with ejection fraction of 20-25% with moderate mitral and tricuspid regurgitation with left ventricular thrombus. She was started on anticoagulant therapy with warfarin and clexane overlap for five days till the target INR was reached. Physiotherapy was started for her. Patient started to improve regarding her neurological function, and power reached 4/5 in both upper and lower limbs. She stayed for ten days and was discharged in good condition, on anticoagulation medication besides anti-failure treatment with follow up with cardiology and physiotherapy outpatient departments.

## 3. Discussion

Peripartum cardiomyopathy is still regarded as a disease of unknown aetiology, although recent evidence suggests a role for a 16 kDa prolactin derivative produced by proteolytic cleavage of prolactin secondary to unbalanced oxidative stress present during late pregnancy and early puerperium [9]. It is associated with a high morbidity and mortality, and diagnosis is often delayed. Various mechanisms have been investigated, including the hypothesis that unbalanced peripartum or postpartum oxidative stress triggers the proteolytic cleavage of the nursing hormone prolactin into a potent antiangiogenic, proapoptotic, and proinflammatory 16 kDa fragment [10]. There is also an increasing evidence that, a complex interaction of genetic and environmental factors contributing to angiogenic imbalance, leading to myocardial dysfunction in a susceptible woman. In PPCM the left ventricular

ejection fraction reduced to less than 45% near the end of pregnancy or within the first 5 months after delivery [11]. In this reported case, the diagnosis was delayed, because the patient presented late after having symptoms for long time since last trimester of pregnancy up to three months after delivery and the echocardiography showed dilated left ventricle with ejection fraction of 20-25%. Treatment of heart failure in PPCM includes use of diuretics, beta blockers, and angiotensin-converting enzyme inhibitors. Early initiation of effective treatment reduces mortality rates and increases full recovery of left ventricular systolic function. Outcomes for subsequent pregnancy after PPCM depends on full recovery of ventricular function [3]. In a study done by Blatt in Assaf Harofeh Medical Center, Zerifin, Israel they found that, in patient with peripartum cardiomyopathy, delivery and postpartum were complicated in 3 patients (42%): 2 with acute heart failure, which resolved conservatively, and 1 with major pulmonary embolism [12]. 7.1% of patients with DCM had experienced a stroke. In the study done by Deng Y1 et al in 2019, they found that decreased estimated glomerular filtration rate (eGFR) is significantly associated with an increased risk of ischemic stroke in patients with DCM. [5]. In this reported case, there was no underlying cause for acute ischamic stroke apart from PPCM. There is limited evidence available for the use of anticoagulation in patients with PPCM, as in our patient, no anticoagulant was prescribed for her by the cardiologist in the cardiac centre where she was diagnosed, although it is used routinely for patients with PPCM. However, a systematic review study done by Kido K et al in 2019, showed that, anticoagulation should be recommended only for patients with an ejection fraction less than 35% until ejection fraction is recovered as well as for patients with PPCM treated with bromocriptine [13]. Around 30-50% of patients with PPCM, recover without complications, with return of baseline LV systolic function to normal and the risk of PPCM in subsequent pregnancies in these women is low [9]. In the first international registry patient with PPCM has similar presentations globally, with heterogeneity in patient management and outcome. Despite improvement in management of PPCM, there is still percentage of women who die or have incomplete recovery from PPCM [14]. Diagnostic criteria used to define PPCM include; the development of heart failure (HF) in the last month of pregnancy or within 5 months post‐partum; the absence of another identifiable cause of HF; the absence of recognizable heart disease prior to the last month of pregnancy; and left ventricular systolic dysfunction demonstrated by classical echocardiography criteria (left ventricular ejection fraction <45%, fractional shortening <30%, or both, with or without an LV end-diastolic dimension >2.7 cm/m2 body surface area [1]. The HF Association of the European Society of Cardiology Working Group on PPCM recently expanded the definition to “an idiopathic cardiomyopathy presenting with HF secondary to left ventricular systolic dysfunction towards the end of pregnancy or in the months following delivery, where no other cause of HF is found [15]. PPCM is associated with serious short- and long-term complications, like acute pulmonary edema, cardiogenic shock requiring mechanical circulatory support, cardiopulmonary arrest secondary to heart failure or arrhythmias, thromboembolic complications, and death [15]. The incidence of maternal complications due to PPCM was found to be as follows: cardiac arrest in 2.1%, heart transplant in 0.5%, mechanical circulatory support in 1.5%, acute pulmonary edema in 1.8%, and cardiogenic shock in 2.6% [14]. Most cases of PPCM were diagnosed during a readmission, according to Masoomi R et al, in their study about epidemiology of early and late presentations of peripartum cardiomyopathy [16]. Our patient in this case report had unexplained heart failure in the last trimester worsening in the first three months after delivery and had acute ischaemic stroke as a serious complication secondary to peripartum cardiomyopathy.

## 4. Conclusions

The importance of this case report relies in the fact that peripartum cardiomyopathy could have serious complication like congestive heart failure, intraventricular thrombus, and acute ischaemic stroke in young age group females with a high morbidity. The impact of PPCM, could have an increased risk of morbidity and mortality in women in child bear age, so multidisciplinary management is needed in our hospital, in such cases in order to diagnose and manage these patients in a proper way as well as to improve the outcome in the future.

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