A Mother's Heart in Trouble: Understanding Peripartum Cardiomyopathy and Its Implications

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Introduction

Despite advances in maternal healthcare, Peripartum Cardiomyopathy (PPCM) remains a significant cause of maternal morbidity and mortality globally, with mortality rates still reaching 10% to 20%. (1) Recent data indicate that up to 25% of patients with PPCM develop chronic heart failure. (2) Is there a need to do more to protect mothers during one of their most vulnerable times?

Take Home Messages

- PPCM is a serious condition with significant maternal morbidity and mortality.
- Early identification of high-risk women through improved screening and a deeper understanding of risk factors is essential.
- More large-scale studies are needed to validate the effectiveness of treatments such as bromocriptine.
- A multidisciplinary approach involving obstetricians, cardiologists, and primary care physicians is crucial to manage and treat PPCM.

The editorial aims to raise awareness about PPCM, highlight the latest research on its risk factors and pathophysiology, and advocate for improved screening and early intervention to reduce its burden on maternal health. Addressing these gaps is important for ensuring better outcomes for mothers worldwide.

What is Peripartum Cardiomyopathy?

In 2010 ESC defined PPCM as an idiopathic form of cardiomyopathy that presents with heart failure due to reduced left ventricular systolic function toward the end of pregnancy or in the months

following delivery, in the absence of any other causes of heart failure.(3) It is a diagnosis of exclusion, with a left ventricular ejection fraction (LVEF) typically reduced below 45%, although the LV may or may not be dilated.(4) The exact incidence in the UK is not known. The worldwide estimates vary according to geographic distribution. The global incidence averages 1 in every 2,000 live births (5, 6), with the highest rates in Nigeria (1 in 100 live births) and Haiti (1 in 300 live births) (7), and the lowest in Japan (1 in 20,000 live births) (8) however, these data should be interpreted with caution due to methodological aspects and possible underreporting.

Risk Factors

PPCM shares genetic predisposition with both familial and sporadic idiopathic dilated cardiomyopathies. Around 15% of patients with dilated cardiomyopathy and peripartum cardiomyopathy share the same types of truncating genetic variants, most notable of which are in the TTN (Titin) gene. (9) Other predisposing factors are summarised in Figure 1.

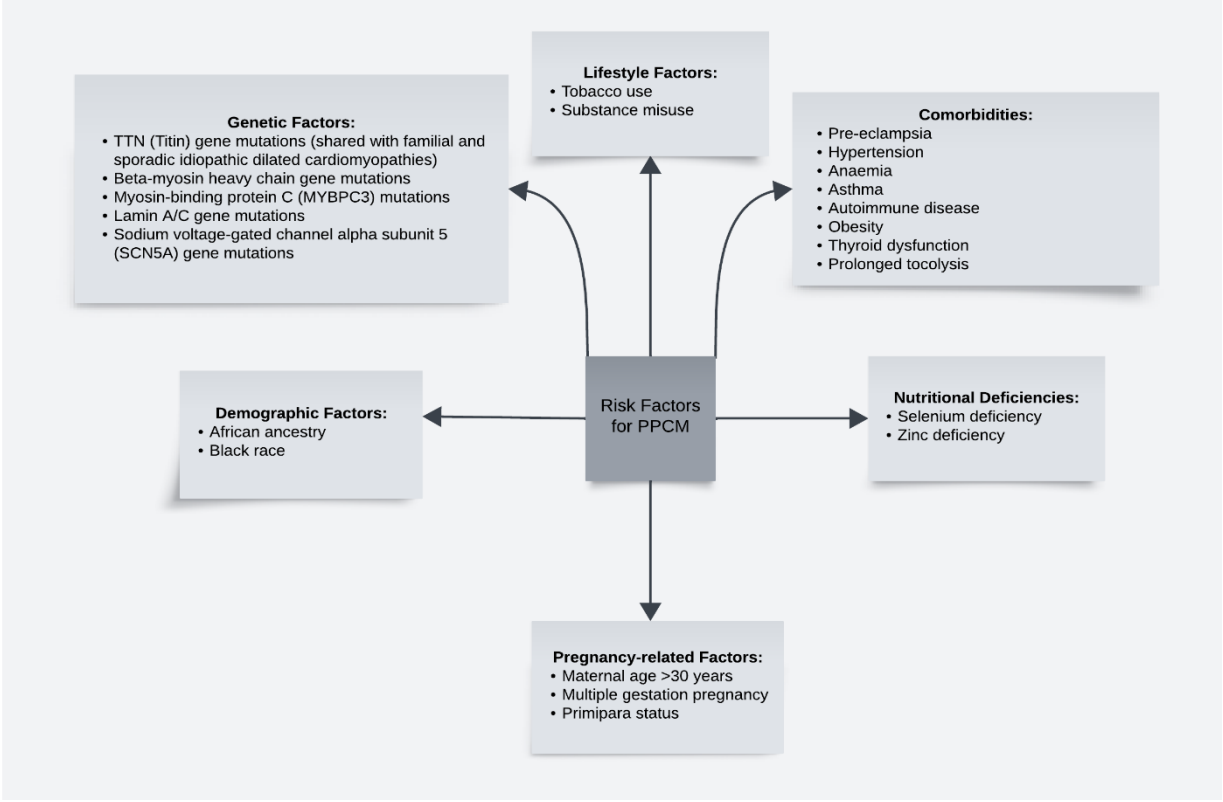

Figure 1. Risk Factors for Peripartum Cardiomyopathy.

What Causes PPCM?

The precise mechanism underlying PPCM remains unclear, though several theories have been proposed. Although the 'two-hit' hypothesis has been implicated in the pathogenesis of PPCM (10), it has not yet been translated into large clinical trials. The oxidative stress-mediated cleavage of the hormone prolactin into a smaller antiangiogenic sub fragment, 16-kDa prolactin, may drive PPCM by inducing endothelial damage (11) and cardiomyocyte apoptosis. (12)

Diagnosis

PPCM symptoms resemble those of congestive heart failure, with patients often experiencing dyspnoea, orthopnoea, peripheral oedema, fatigue and malaise. Non-specific clinical features are difficult to distinguish from physiological changes in pregnancy which adds to the diagnostic challenge. Examination findings may show sinus tachycardia, increased jugular venous pressure, and signs of peripheral congestion. Indicators of left ventricular dilation may include a third heart sound (S3), a displaced apex beat, and a pansystolic murmur suggestive of functional mitral regurgitation. However, S3 and systolic flow murmurs can be detected in most pregnant patients due to hyperdynamic circulation. In rare cases, patients may present with acute pulmonary oedema or cardiogenic shock. (13)

Management

ESC recommends treating PPCM similar to heart failure with reduced ejection fraction from other causes. However foetal risks, labour and delivery plans, postpartum care, and counselling about future pregnancy risks need to be considered when managing such patients. Medication choice varies according to the timing of presentation and whether the patient is breastfeeding. During the antenatal period, ACE-I s, ARBs, SGLT2 inhibitors, and mineralocorticoid receptor antagonists are avoided as they are contraindicated in pregnancy. Diuretics, beta blockers, hydralazine/nitrates, digoxin, and inotropes are used for the treatment of PPCM during the antenatal period. In addition, patients may require treatment for arrhythmias, anticoagulation therapy, mechanical support, and therapies such as bromocriptine.

Prognosis

Approximately 50% of the patients recover with medical therapy and 25 % develop chronic heart failure. (2) LVIDD >6 cm, ejection fraction (<30%) at the time of diagnosis (14), the presence of cardiogenic thrombus and raised pulmonary artery pressures are associated with poorer long-term outcomes. (15)

Current research

Blocking prolactin with the dopamine D2 receptor agonist, bromocriptine, has gained recognition as a potential targeted therapy for PPCM. It has been included in the ESC guidelines for cardiovascular diseases in pregnancy as a treatment option to be considered. (16) Pentoxifylline, intravenous immunoglobulin (IVIG), antisense therapy against microRNA-146a, VEGF analogs, serelaxin and perhexiline are experimental therapies that show potential, although clinical trials on humans are needed to establish their therapeutic role. (17, 18)

Future Challenges

Despite the advances in research, significant gaps remain in our understanding of PPCM. The specific factors that cause individuals with a genetic predisposition to develop severe heart failure during the peripartum period are not yet fully understood and continue to be the focus of ongoing research. More concerted effort should be put into discovering biomarkers that can detect women at risk earlier in pregnancy. Randomized clinical trials are needed to assess the effectiveness of therapies such as bromocriptine in larger populations. Until then, a multidisciplinary approach involving obstetricians, cardiologists, and primary care physicians is essential to improve maternal outcomes.

Disclosure:

Language errors and grammatical mistakes corrected with the help of Chat GPT version 4o.

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