SEVEN publicações acadêmicas
EM PARCERIA COM: IEMS UNIASSELVI

Pathophysiology of Peripartum Cardiomyopathy: Interactions between angiogenic, hormonal and inflammatory factors

Pedro Fechine Honorato[1], Dhiego Alves de Lacerda[2], Anaylle Vieira Lacerda de Oliveira[3], Livia Damasceno Rosseti[4], Luana Alves de Andrade[5], Maria Eduarda Borges e Cunha[6], Ianny Vitória Mendes Moura[7], Pâmella Simões Barel[8], Alexandre Sena Camargos Figueiredo[9], Maria Gabriela Fernandes de Souza[10], Advisor: Dr. Caio Visalli Lucena da Cunha[11].

ABSTRACT

Peripartum cardiomyopathy (PPMC) is a rare condition that causes left ventricular dysfunction and heart failure in healthy women during the peripartum period. This study explores the pathophysiology of CMPP, highlighting inflammatory, autoimmune, and hormonal factors that contribute to the condition, as well as identifying genetic variants associated with increased risk. The literature review revealed the complexity of CMPP and aims to contribute to the prevention, diagnosis and effective treatment of the disease.

Keywords: Cardiomyopathy, Cardiovascular physiological phenomena, Peripartum period.

INTRODUCTION

Peripartum cardiomyopathy (PPMC) is a rare condition that affects healthy women during the peripartum period, resulting in left ventricular dysfunction and heart failure (Bala *et al*., 2023; Douglass, Blauwet., 2021). Its incidence varies globally, being more prevalent among people of African descent, and is associated with several risk factors, such as advanced maternal age, multiparity, obesity, and preeclampsia (Melo *et al*., 2023; Koziol, Aronow., 2022).

This clinical condition challenges healthcare providers due to its complexity and potential impact on maternal and fetal health (Nariño *et al*., 2024). This study aims to deepen the understanding of the pathophysiology of CMPP by exploring the inflammatory, autoimmune, and hormonal factors that contribute to this cardiac condition during the peripartum period in previously healthy women.

[1] Santa Maria University Center (UNIFSM) – PB
[2] Santa Maria University Center (UNIFSM) – PB
[3] Santa Maria University Center (UNIFSM) – PB
[4] Faculty of Medical and Health Sciences of Juiz de Fora (SUPREMA) – MG
[5] Universidade Jose do Rosario Vellano – MG
[6] University of Uberaba (UNIUBE) – MG
[7] Funorte – MG
[8] Complex of the Hospital de Clínicas of the Federal University of Paraná (EBSERH) – PR
[9] University of Pernambuco (UPE) – PE
[10] Universidade Potiguar (UnP) – RN
[11] Santa Maria University Center (UNIFSM) – PB

MATERIALS AND METHODS

To achieve this objective, a detailed literature review was carried out in several renowned databases, including *SciELO, PubMed, Google Scholar* and Virtual Health Library. The descriptors used included terms in Portuguese, English, and Spanish related to CMPP, such as "Cardiomyopathy", "Cardiovascular Physiological Phenomena", and "Peripartum Period".

The selection of articles considered studies from the last 4 years, systematic reviews and meta-analyses relevant to the understanding of complications associated with CMPP. After a careful analysis, 10 articles that most contributed to the specific objectives of this investigation were selected**.**

RESULTS

The pathophysiology of CMPP is highly complex, resulting from an intricate interaction between multiple factors (Schaufelberger., 2019). Among these factors, genetic aspects play a significant role, evidenced by studies that have identified specific genetic variants associated with a higher risk of developing CMPP (Dahie., 2022; Neto, Catto., 2020).

In addition, inflammation is recognized as a key component in the pathogenesis of CMPP. Proinflammatory cytokines, such as tumor necrosis factor alpha (TNF-α) and interleukin-6 (IL-6), have been implicated in the ventricular dysfunction seen in the disease, triggering a cascade of events that lead to myocardial injury and subsequent heart failure. Another important aspect is the dysregulated autoimmune response in CMPP (Hoes *et al*., 2022; Nariño *et al*., 2024).

Studies highlight the presence of autoantibodies directed against cardiac receptors, such as adrenergic receptor beta 1 (β1-AR) and angiotensin II receptor type 1 (AT1-R), which play a role in the deterioration of cardiac function (Bauersachs *et al*., 2019; Koziol, Aronow., 2022; Davis *et al*., 2020). In addition, excessive apoptosis of cardiomyocytes is a relevant pathophysiological mechanism in PPCM, contributing to the loss of myocardial mass and impairment of cardiac contractility (Douglass, Blauwet., 2021; Jha, Jha., 2021).

FINAL CONSIDERATIONS

This study presented an in-depth analysis of the pathophysiology of CMPP, highlighting the inflammatory, autoimmune, and hormonal factors that play a crucial role in left ventricular dysfunction and heart failure during the peripartum period in healthy women. The careful literature review and the selection of the most relevant articles allowed a more comprehensive understanding of the complications associated with CMPP and contributed to the current scientific knowledge about this rare disease.

It is hoped that the results of this research will provide valuable insights for the development of strategies for prevention, early diagnosis, and effective treatment of CMPP, thereby benefiting maternal and fetal health.

REFERENCES

Bala, R., et al. (2023). Cardiomiopatia periparto: Uma revisão. Revista Portuguesa de Cardiologia.

Bauersachs, J., et al. (2019). Fisiopatologia, diagnóstico e tratamento da cardiomiopatia periparto: Uma declaração de posição da Associação de Insuficiência Cardíaca do Grupo de Estudo da Sociedade Europeia de Cardiologia sobre cardiomiopatia periparto. Revista Europeia de Insuficiência Cardíaca, 21(7), 827-843.

Dahie, H. A. (2022). Determinantes de eventos de quase acidente materno entre mulheres internadas em hospitais terciários em Mogadíscio, Somália: Um estudo de caso-controle baseado em instalações. BMC Gravidez e Parto, 1, 658.

Davis, M. B., et al. (2020). Peripartum cardiomyopathy: JACC state-of-the-art review. Journal of the American College of Cardiology, 75(2), 207-221.

Douglass, E. J., & Blauwet, L. A. (2021). Peripartum cardiomyopathy. Cardiology Clinics, 39(1), 119-142.

Hoes, M. F., et al. (2022). Pathophysiology and risk factors of peripartum cardiomyopathy. Nature Reviews Cardiology, 19(8), 555-565.

Jha, N., & Jha, A. K. (2021). Peripartum cardiomyopathy. Heart Failure Reviews, 26(4), 781-797.

Koziol, K. J., & Aronow, W. S. (2023). Peripartum cardiomyopathy: Current understanding of pathophysiology, diagnostic workup, management, and outcomes. Current Problems in Cardiology, 48(8), 101716.

Melo, J. V. B., et al. (2023). Miocardiopatia periparto: Uma revisão sistemática sobre etiologia, diagnóstico e tratamento. Seven Editora.

Nariño, Y. D. D., et al. (2024). Miocardiopatia periparto, revisión de los mecanismos e implicaciones clínicas de una patología catastrófica. Ciencia Latina Revista Científica Multidisciplinar, 8(3), 937-948.

Neto, J. H. A. M., & Catto, R. (2020). Miocardiopatia periparto: Um relato de caso. Brazilian Journal of Health Review, 3(6), 19349-19351.

Schaufelberger, M. (2019). Cardiomyopathy and pregnancy. Heart, 105(20), 1543-1551.