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COMPARATIVE PATHOMORPHOLOGICAL FEATURES OF PERIPARTUM CARDIOMYOPATHY IN FIRST AND SUBSEQUENT PREGNANCIES

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Abstract

Peripartum cardiomyopathy (PPCM) is a potentially life-threatening form of heart failure that develops toward the end of pregnancy or during the postpartum period. The disease is associated with myocardial remodeling, cardiomyocyte injury, interstitial fibrosis, and impaired ventricular contractility. Maternal age, pregnancy-related hypertension, and reproductive history may influence disease development. However, the relationship between pregnancy parity and myocardial structural abnormalities remains insufficiently understood.

Objective. To compare the pathomorphological characteristics of peripartum cardiomyopathy associated with first and subsequent pregnancies and to evaluate the possible relationship between pregnancy parity and myocardial remodeling.

Materials and methods. A comparative literature-based analysis of five published scientific studies was performed. The selected publications included clinical investigations of pregnancy parity and histopathological studies of myocardial tissue in peripartum cardiomyopathy. Particular attention was given to cardiomyocyte hypertrophy, myocardial degeneration, inflammatory infiltration, interstitial fibrosis, and structural remodeling. Findings related to primiparous and multiparous women were evaluated separately where the published data permitted comparison.

Results and discussion. Histopathological investigations have demonstrated that peripartum cardiomyopathy is associated with cardiomyocyte hypertrophy, interstitial and focal myocardial fibrosis, and inflammatory cell infiltration. In a study involving 11 women with peripartum heart disease, Sanderson et al. identified histological features of healing myocarditis in five patients (45.5%), including inflammatory infiltration, focal necrosis, myocardial hypertrophy, and fibrosis.

Kawano et al. examined myocardial biopsy specimens from five women aged 28–42 years with clinically diagnosed peripartum cardiomyopathy. Myocardial hypertrophy, fibrosis, and inflammatory infiltration were observed. Two patients had lymphocytic myocarditis, one had eosinophilic myocarditis, and two demonstrated hypertensive cardiac pathology, including one case combined with myocarditis.

The association between pregnancy parity and disease development varies across populations. Shani et al. analyzed 36 women with peripartum cardiomyopathy and found that 63.9% were primiparous. The affected women also had a higher frequency of multifetal pregnancies and hypertensive complications than the comparison population.

Conversely, a systematic review and meta-analysis published in 2025, including 18 studies, identified a significant association between parity and peripartum cardiomyopathy risk (OR 1.79; 95% CI 1.21–2.67; $p = 0.004$).

These findings indicate that reproductive history may influence susceptibility to peripartum cardiomyopathy, although the direction and magnitude of this association vary between studies. Importantly, the available histopathological investigations do not establish whether primiparous and multiparous women differ significantly in cardiomyocyte diameter, myocardial fibrosis, inflammatory infiltration, or microvascular remodeling.

Conclusion. Peripartum cardiomyopathy is associated with myocardial hypertrophy, interstitial fibrosis, degenerative changes, and, in some patients,

inflammatory myocardial injury. Clinical evidence suggests that pregnancy parity may influence disease susceptibility, but a distinct parity-dependent myocardial morphological pattern has not yet been established. Comparative histological and morphometric examination of myocardial tissue from primiparous and multiparous women may clarify the relationship between reproductive history and the severity of myocardial remodeling.

References

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