



ORIGINAL ARTICLE

Rest left ventricular function and contractile reserve by dobutamine stress echocardiography in peripartum cardiomyopathy

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KEYWORDS

Dobutamine stress echocardiography;
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Abstract

Aims: To assess whether contractile reserve during dobutamine stress echocardiography (DSE) can predict left ventricular functional recovery in patients with peripartum cardiomyopathy and to assess myocardial fibrosis by magnetic resonance imaging (MRI) in these patients.

Methods: Nine patients with peripartum cardiomyopathy were enrolled. All patients underwent DSE and were followed for six months, when a rest Doppler echocardiogram was repeated. MRI was also performed at the beginning of follow-up to identify myocardial fibrosis.

Results: Mean age was 29 ± 7.9 years and mean left ventricular ejection fraction at baseline was $39.4 \pm 8.6\%$ (range 24–49%). Eight of the nine patients showed left ventricular functional recovery with mean ejection fraction at follow-up of $57.1 \pm 13.8\%$. The ejection fraction response to DSE did not predict recovery at follow-up. On the other hand, left ventricular ejection fraction at baseline correlated with ejection fraction at follow-up. Mild fibrosis was detected in only one patient.

Conclusion: Left ventricular ejection fraction at baseline was a predictor of left ventricular functional recovery in patients with peripartum cardiomyopathy. Dobutamine stress echocardiography at presentation of the disease did not predict recovery at follow-up. Myocardial fibrosis appeared to be uncommon in this cardiomyopathy.

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PALAVRAS-CHAVE

Ecocardiograma de estresse com dobutamina; Miocardiopatia periparto; Fibrose miocárdica; Gravidez

Função ventricular esquerda em repouso e reserva contrátil pelo ecocardiograma de estresse com dobutamina na miocardiopatia periparto

Resumo

Objetivos: Avaliar se a reserva contrátil durante o ecocardiograma de estresse com dobutamina (EED) pode prever a recuperação funcional do ventrículo esquerdo em pacientes com miocardiopatia periparto e também acessar a fibrose miocárdica através da ressonância nuclear magnética (RNM) nestas pacientes.

Métodos: Nove pacientes com miocardiopatia periparto foram incluídas. Todas as pacientes foram submetidas ao EED e acompanhadas por 6 meses, quando um novo ecocardiograma de repouso foi realizado. A RNM também foi realizada no início do seguimento para identificar fibrose miocárdica.

Resultados: A idade média das pacientes foi de $29 \pm 7,9$ anos e a fração de ejeção basal média do ventrículo esquerdo foi de $39,4 \pm 8,6\%$ (variando de 24 a 49%). Oito das nove pacientes tiveram recuperação funcional do ventrículo esquerdo, com fração de ejeção média no seguimento de $57,1 \pm 13,8\%$. A resposta da fração de ejeção ao EED não foi um preditor de recuperação no seguimento. Por outro lado, a fração de ejeção basal teve correlação com a fração de ejeção no seguimento. Fibrose discreta foi detectada em apenas uma paciente.

Conclusão: A fração de ejeção basal do ventrículo esquerdo foi um preditor de recuperação funcional ventricular em pacientes com miocardiopatia periparto. O EED na apresentação da doença não foi um preditor de recuperação no seguimento. Fibrose miocárdica pareceu ser incomum nesta miocardiopatia.

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Introduction

Peripartum cardiomyopathy (PC) is a rare disease, recognized as early as the 18th century,¹ and its diagnostic criteria were established in 1937.^{2,3} It is characterized by heart failure during the last month of pregnancy through the fifth month postpartum, without heart disease before the last gestational month, and no determinable cause.³

Because of its rarity, geographical differences and heterogeneous presentation, diagnosis may be difficult.³ Traditionally, it has been related to old maternal age, black race, greater parity and multiple gestation, but the underlying cause remains elusive.⁴ The reported prevalence of this disorder ranges from one in 100 to one in 15 000 pregnancies.^{2,5,6} In a recent report, the incidence in 241 497 deliveries was one in 4025, and was highest among African-Americans.⁷

In contrast to idiopathic dilated cardiomyopathy, left ventricular (LV) dilation and systolic dysfunction return to normal in more than 50% of patients within six months,² although in a recent study in 100 African women with PC, the authors reported that ejection fraction (EF) returned to normal in only 23% of the patients.⁸ Higher EF and smaller LV diameter at the time of diagnosis have been shown to be associated with recovery and with a better prognosis,^{4,8-10} although there is some controversy.¹¹ Although the presence of fibrosis, detected by biopsy¹² and by cardiac magnetic resonance imaging (MRI),^{13,14} has been described in PC, its role in recovery of function is not known.

Dobutamine is a synthetic sympathomimetic amine that directly stimulates beta-1 receptors in the myocardium to increase myocardial contractility. Dobutamine stress echocardiography has been shown to be safe and accurate in

detecting coronary artery disease¹⁵ and evaluating myocardial viability in patients with LV dysfunction.¹⁶ More recently, it has been used to analyze contractile reserve in patients with PC in order to predict recovery of function.¹⁷

The objectives of the present study were: (1) to assess whether low-dose dobutamine stress echocardiography, performed at an early stage of PC, can predict recovery of LV function in these patients; and (2) to assess whether myocardial fibrosis can be detected by cardiac magnetic resonance imaging (MRI).

Methods**Study group**

Nine consecutive women with a diagnosis of PC from a single public maternity hospital were enrolled. Patients were included only if they were seen by the cardiologist in the first week after they had sought medical assistance. The diagnosis of PC was based on the development of congestive heart failure during pregnancy or the puerperium, if previous heart diseases or possible precipitating factors (anemia, morbid obesity, cesarean section myocarditis, infection, alcohol abuse) could be excluded.

Doppler echocardiogram

During the development of the disease, all patients underwent a comprehensive Doppler echocardiogram which detected some degree of systolic dysfunction (EF <50% during optimized medical treatment for congestive heart failure) soon after delivery, to confirm the diagnosis of systolic

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