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Peripartum Cardiomyopathy Due to Gestational Hypertension and Tocolytic Therapy

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Abstract

Introduction: Peripartum cardiomyopathy (PPCM) is a rare and sometimes fatal systolic heart failure that affects women during late pregnancy or the early postpartum period. Risk factors contributing to this condition are: advanced maternal age, multiparity, administration of tocolytic agents, underlying cardiac disease, iatrogenic volume overload, preeclampsia, hypertension and In patients with gestational hypertension (GH) and other risk factors close monitoring is mandatory during pregnancy as well as in the postpartum period.

Case report: A 38 year- old patient previously treated for endometriosis, infertility and GH was transferred from the Clinic of Gynecology due to diagnosed congestive heart failure. Five days prior admission she gave birth to her first child. Prior delivery she was treated with tocolytic therapy. She received methyldopa due to GH, that was abruptly discontinued after her delivery. Echocardiography on admission revealed moderately reduced left ventricular systolic function with an ejection fraction (EF) of 37% with dilated left ventricle (LV) and pulmonary artery hypertension (PAH) secondary to left ventricular failure. During hospitalization the patient was with signs of volume overload, but with well response on parenteral diuretic therapy. She was additionally treated with guideline recommended heart failure therapy. The controlled echocardiography showed improvement of the left ventricular function with an EF of 42%.

Conclusion: PPCM is a rare condition with high morbidity and mortality. An LVEF <30%, marked LV dilatation, LV end-diastolic diameter >6.0 cm, and RV involvement are associated with adverse outcomes. Although delivery of the fetus and the placenta trigger resolution of symptoms and recovery to the nonpregnant state of various organism, the contrary happens with blood pressure. Its peaking time is three to six days after delivery. Hypertension medication must not be immediately terminated. Prolonged tocolytic therapy are a risk factor for PPCM due to causing decreased baroreflex sensitivity Patients with risk factors should be closely monitored for eventual cardiac complications.

Keywords: Postpartum cardiomyopathy; Gestational hypertension; Tocolytic therapy

Introduction

Peripartum cardiomyopathy (PPCM) is a rare and sometimes fatal systolic heart failure that affects women during late pregnancy or the early postpartum period. It is characterized with a left ventricular ejection fraction (LVEF) of <45% during the last month of pregnancy or within 5months following delivery. Risk factors contributing to this condition are: advanced maternal age, multiparity, administration of tocolytic agents, underlying cardiac disease, iatrogenic volume overload, preeclampsia, hypertension and In patients with gestational hypertension and other risk factors close monitoring is mandatory during pregnancy as well as in the postpartum period [1-3].

Case Report

A 38 year- old patient previously treated for endometriosis and infertility was transferred from the Clinic of Gynecology due to diagnosed congestive heart failure. There she was hospitalized under suspicion of acute cardiac decompensation with symptoms of severe dyspnea, orthopnea and leg swelling. Five days prior admission the patient gave birth to her first child. During pregnancy she was diagnosed with gestational hypertension and was treated with methyldopa. The medication was abruptly discontinued after her delivery. One month prior delivery she was treated with tocolytic agents. On presentation the patient was in sinus tachycardia, dyspneic with elevated blood pressure (Figures 1 & 2).

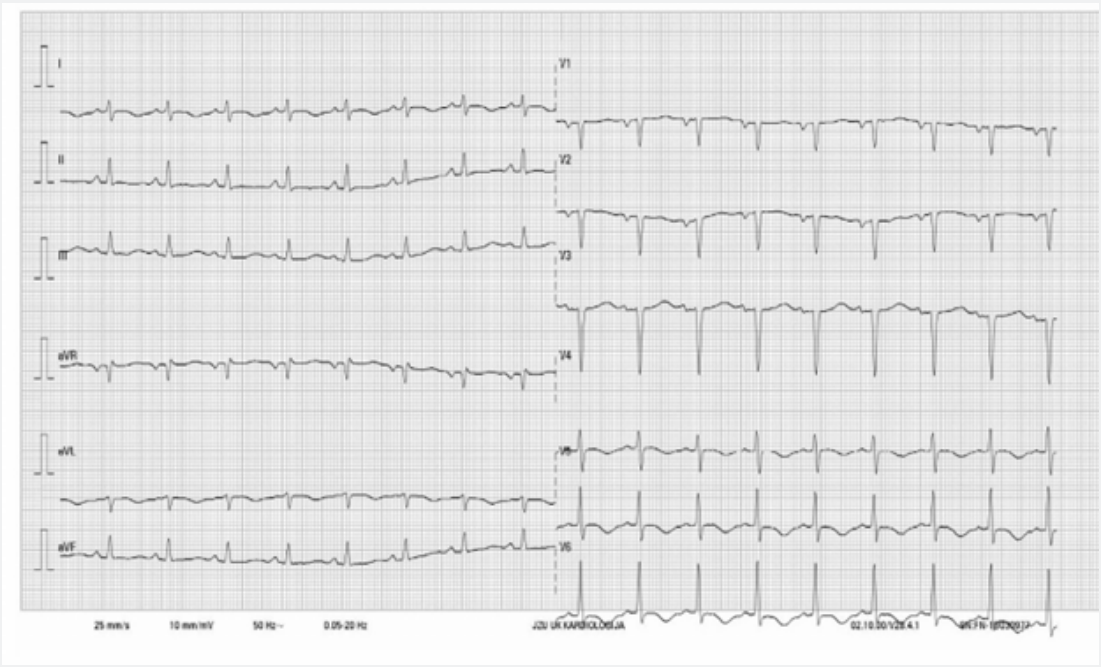

Figure 1: ECG on admission.

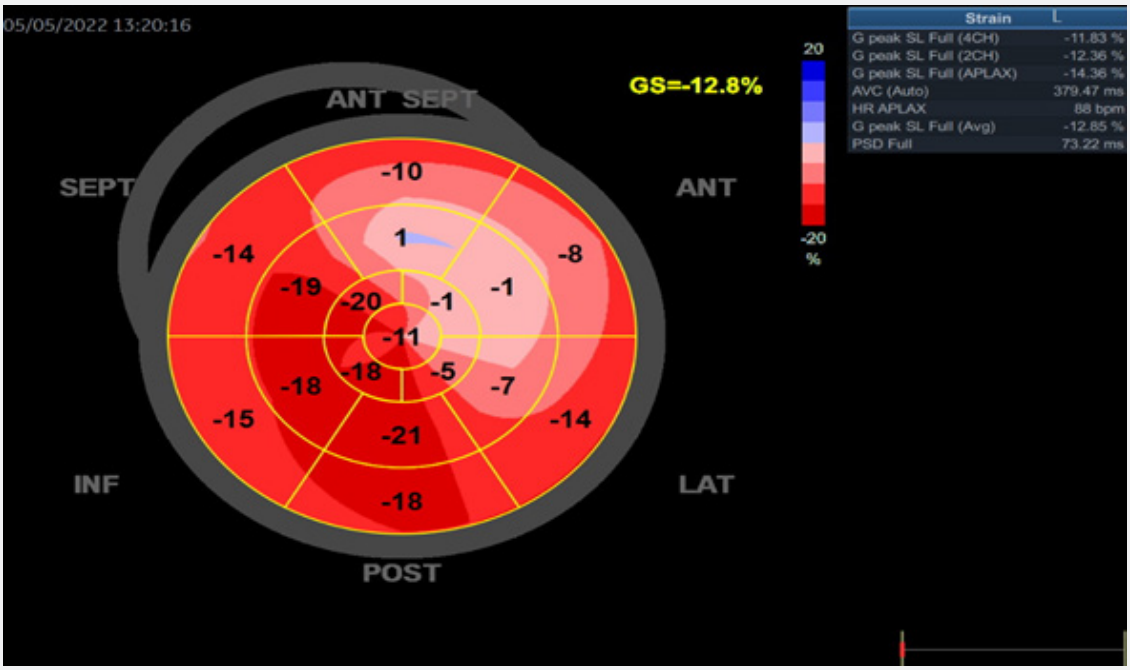

Figure 2: Strain echocardiography.

Echocardiography was made prior admission in our hospital and showed dilated ventricle with left ventricular dimension (58mm), increased left ventricular volumes and severely reduced left ventricular systolic function with EF 34% with global wall. Pulmonary artery hypertension was also present (PAH) with sPAP of 55mmHg.

The laboratory findings had increased NT- pro-BNP 5500pg/ml, Troponin I – 215ng/L (RF 15.6). and a very low level of

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potassium – 2.7mmol/L. All other parameters were in their referential value. She was hospitalized in the intensive care unit (ICU) and immediately started on parenteral diuretic therapy and antihypertensive medications. Because of persistently low potassium, despite of its substitution, neprhologist and endocrinologist were consulted. Urinary and hormonal analysis were made, that detected no abnormalities. What should be noted is that the patient had polyuria here first 3 days with diuresis reaching up to 10 liters per day, demonstrating the high volume overload she had. The potassium level was normal on the fourth day of admission [4-6].

Her controlled echocardiography showed improvement in the left ventricular function with an EF 40% and LVEDd 54mm. After one week she was hemodynamically stable, euvolemic and discharged home with optimal medicament therapy for heart failure. Three months after discharge another echocardiography was made with finding of perserved left ventricular dimension and function and no PAH. The patient continued receiving antihypertensive medication (Figure 3).

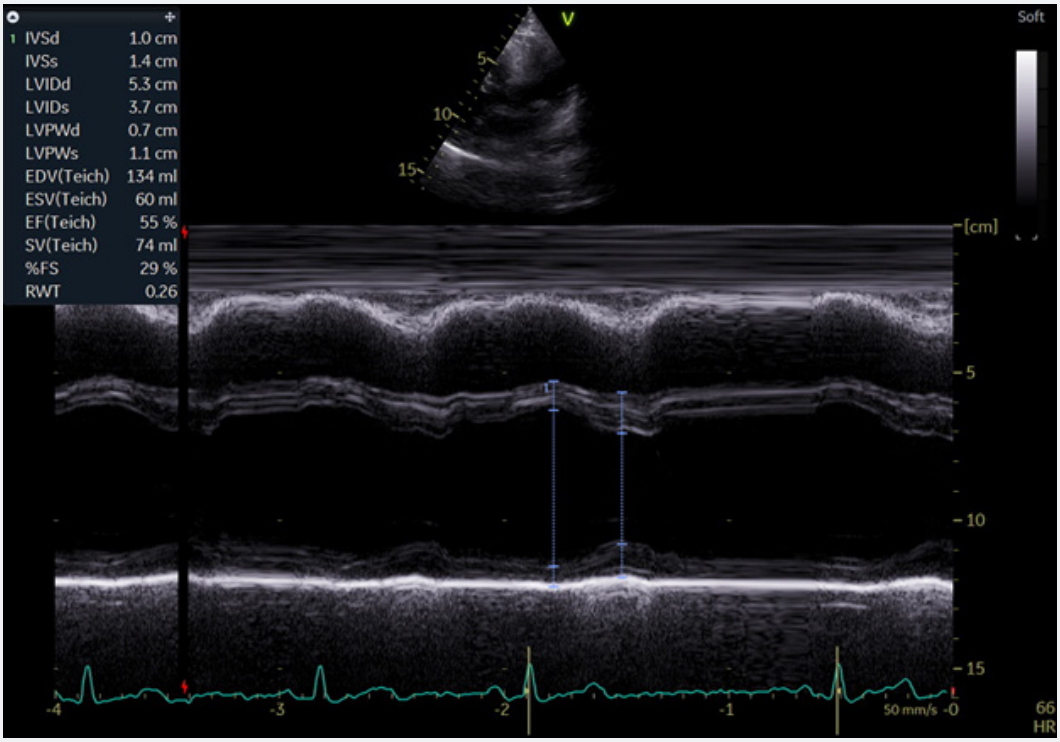

Figure 3: Transesophageal echocardiography - M-mode showing improvement of the left ventricular systolic function..

Discussion

PPCM is an idiopathic cardiomyopathy. Various pathogenetic mechanisms are proposed. Although delivery of the fetus and the placenta trigger resolution of symptoms and recovery to the nonpregnant state of various organism, the contrary happens with blood pressure. Women that suffer from gestational hypertension tend to have their peak blood pressure three to six days after delivery. Hypertension medication must not be immediately terminated, especially in the early postpartum period. Prolonged tocolytic therapy are a risk factor for PPCM Side effects of these agents are: tachycardia, shortness of breath, chest pain, pulmonary oedema, hypokalemia, hyperglicemia. They cause decreased baroreflex sensitivity that leads to dysregulation of vagal heart rate and increased blood pressure variation. Additionally, their beta agonistic effect is potentially cardiotoxic.

Conclusion

PPCM is a rare condition with high morbidity and mortality. An LVEF <30%, marked LV dilatation, LV end-diastolic diameter >6.0 cm, and RV involvement are associated with adverse outcomes. Substantial morbidity continues beyond the peripartum period with venous thromboembolism and recurrent heart failure hospitalizations being the most common complication. Patients with risk factors should be closely monitored for eventual cardiac complications. Prompt diagnosis is mandatory and treatment according to the ESC guidelines for heart failure is recommended in patients presenting with this condition after delivery.

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