Original Article

Reporting a case of peripartum cardiomyopathy (PPCM)

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ABSTRACT

Introduction: Peripartum cardiomyopathy is a critical situation associated with pregnancy, which occurs generally in the range of one month prior to childbirth to five months after it. The purpose of the current study was to evaluate a case of peripartum cardiomyopathy in a 30-week pregnant mother who had comorbid symptoms of pre-eclampsia. Results: A 30-year-old pregnant woman, G1 at 30 weeks of pregnancy, having high blood pressure and symptoms of pre-eclampsia including blurred vision, dizziness, tachypnea, and repeated vomiting had come to clinic. The patient was diagnosed as a case of pre-eclampsia and treatment was conducted accordingly. After giving birth to the child through cesarean method, peripartum cardiomyopathy was confirmed based on the patient's condition and her cardiac symptoms. The patient was discharged with a desirable general condition after three weeks of intensive care. Conclusion: The cardiac symptoms of mothers should be considered during pregnancy, especially when comorbid with pre-eclampsia. Considering the importance of early diagnosis of peripartum cardiomyopathy, and given that pre-eclampsia can be one of the causes of peripartum cardiomyopathy, careful cardiovascular monitoring of women with pre-eclampsia is an important issue.

Keywords: Peripartum cardiomyopathy, pre-eclampsia, cardia, pregnancy

Introduction

Several cardiac and hemodynamic changes occur during the pregnancy through which the overall workload of the heart increases. Increased heart workload exacerbates cardiac diseases. Peripartum cardiomyopathy (PPCM) is one of the most important and life-threatening diseases of mothers during the pregnancy period.

PPCM is a type of dilated cardiomyopathy that causes the enlargement of the cardiac muscle and leads to its weakness [1].

PPCM generally occurs in the range of one month prior to 5 months after the childbirth. The symptoms include the shortness of breath, dyspnea, edema of the lower extremities, weakness, anemia, and hypotension. The clinical diagnosis is challenging during pregnancy because the symptoms may be overlapping with the normal symptoms of pregnancy, especially in the third trimester. Therefore, diagnosis could be delayed and the disease may be neglected [2].

The criteria for the diagnosis of cardiomyopathy include the following:

- Symptoms of heart failure occurring around the last month of pregnancy up to 5 months later are observed.
- Heart pumping ability may be reduced and left ventricular may face dysfunction so that EF of the heart is seen less than 45% in echocardiography.
- And unexplained symptoms of heart failure that do not have a special reason (in case other causes of heart failure are not ruled out).

The exact cause of PPCM is still unclear. However, some of the proposed reasons include microchimerism (entering of embryo cells into mother's circulation), autoimmune issues, inflammatory and genetic procedures. A number of studies have found that PPCM may be associated with vascular dysfunction. The risk factors of the disease include obesity, history of heart disease, smoking, multiple pregnancies, poor nutrition and high age [3].

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Almost 90% of PPCM cases occur in the first two months after childbirth. The trend of the disease may be progressive or gradual, and in some cases, the disease will quickly enter the severe phase. Peripartum cardiomyopathy is generally an uncommon disease, however, the prevalence of PPCM is 10-15% in developing countries. Therefore it requires special attention. Unfortunately, the disease occurs unexpectedly in young women (in the period of fertility) with complications such as arrhythmias, congestive heart failure, as well as the possibility of embolism and fatality of the pregnant mother. The death rate associated with PPCM is about 10% (Up to 25% in African races) and the rate of death among newborns from the affected mothers is 50% [4].

Cardiomyopathy affects the maternal mortality rate (MMR) of pregnant mothers. Most cases of maternal death due to the disease occur within three months after childbirth because of the progression of cardiac symptoms and the occurrence of thromboembolic events. If the disease is not diagnosed quickly and not treated properly, it may be dangerous for both the mother and baby. The incidence of maternal`s and newborns` mortality imposes a heavy psychological burden on families.

Treatment of patients diagnosed with PPCM is done through careful monitoring and using of medications such as beta blockers, diuretics, and other cardiovascular medicines, ballooning, and sometimes more advanced interventions. In many cases, the heart returns to its normal size after childbirth and treatment, but in some women, the symptoms progress quickly, thus threaten the mother's life. The prognosis is weakened with more diastolic dysfunction. Considering the risk of a recurrence in later pregnancies, patients with minor cardiovascular function recovery are not recommended to become pregnant again because constant pregnancies can seriously increase the risk of death in mothers [2].

Results

The patient was a 30-year-old woman, experiencing first pregnancy of 30 weeks having the complaints of blurred vision, headache, dizziness, frequent vomiting, shortness of breath, tachypnea and with a blood pressure of 180/115. The patient was anxious and had RR:30 and PR:110 in the initial examination. Rale sound was heard in the auscultation of the lungs. Results of the primary tests were as following:

HB: 12.2, PLT: 138000, PT: 17, PTT: 38, IR: 1.7, Cr: 1.2, K: 49 Na: 132, BUN: Pro: +4 Alk p: 130, AST: 47, - Bili direct: 0.5, Bili total: 1.5

Due to the preterm labor and high blood pressure, the patient was immediately institutionalized and oxygenized, and the mother and infant were monitored. Magnesium sulfate and hydralazine were administered to the patient because of high blood pressure and diagnosis of pre-eclampsia. Due to persistent hypertension, the patient was treated with Labetalol after the internal consultation. Although the blood pressure was decreased, the patient was still complaining about abdominal pain, therefore Pantoprazole was administered with the consultation of the internal physician.

The patient was still suffering from the shortness of breath. According to the symptoms, dyspnea and lung auscultation, Tamiflu was administered in the first step due to the diagnosis of influenza, and cardiac consultation was requested. Doppler ultrasonography of the pelvic area and lower extremities showed no evidence of clots in the vein. The cardiac consultation and echocardiography were performed. Echocardiography reports showed that EF: 309 and slight MR. ECG was normal. After cardiac consultation, echocardiography, and obtaining a bacterial culture of the patient's throat secretions, acute pulmonary edema was diagnosed and it was adjusted to transfer her to a more equipped hospital. The mother was intubated and transferred to a more equipped hospital by an ambulance.

After a few hours of monitoring, the mother was prepared for cesarean surgery and was sent to the operating room. She was confounded and drowsy, with severe nausea at the time of entering the operation room. The volume of urine was 200 cc. Cesarean section was performed and the newborn had a weight of 400 grams with severe growth deficiency. After cesarean srugery, the patient had severe dyspnea and tachycardia, which did not respond to oxygen therapy and primary supportive measures. The echocardiography showed diastolic dysfunction of the ventricles and reduced EF. Therefore, the patient was admitted to intensive care with the diagnosis of PPCM. Three weeks later, the patient was discharged with a blood pressure of 80/120, RR:18, and PR: 78. This report was prepared through a consent from the patient.

Discussion

In this report, a case of pre-eclampsia was described in which the mother was treated with the diagnosis of cardiomyopathy after childbirth. This report can be remarked by the health care teams in terms of the relationship between pre-eclampsia and peripartum cardiomyopathy.

Generally, the onset of symptoms in PPCM is seen during late pregnancy period and the early postpartum period and is rarely seen before the 36th week of gestation. However, the symptoms of peripartum cardiomyopathy were seen at 30-week of pregnancy in this case, and the sensitivity of hypertension in preterm pregnancy and attempt to the child birth concealed the symptoms of the mother. Eventually, the cardiac disease was diagnosed only after childbirth of the mother. Pre-eclampsia leads to a situation similar to heart failure, however, the normal systolic function is detained. Symptoms of peripartum cardiomyopathy are sometimes similar to pre-eclampsia, which leads to a delayed diagnosis of PPCM. Recent studies have reported that pre-eclampsia involvement was observed in 15-68% of peripartum cardiomyopathy cases. Pre-eclampsia is associated with diastolic dysfunction, left ventricular remodeling, cardiomyopathy, and cardiovascular diseases of the mother. Genetic complications may be associated with cardiomyopathy. Gammill et al. (2018) stated that predisposing mutations are common in patients with pre-eclampsia which

makes them vulnerable to idiopathic and peripartum cardiomyopathies [5].

Therefore, pre-eclampsia is considered as an independent risk factor for peripartum cardiomyopathy, however, this has not yet been proven in clinical trials. It seems that these two disorders have a common pathology. Hence, better understanding of the overlapping of these two conditions in pregnancy is necessary. It can even be stated that left ventricular dysfunction in pre-eclamptic or pregnancy hypertension patients should be no longer considered as an idiopathic situation, rather cardiomyopathies should be taken into account seriously. In addition, echocardiography should be considered in patients with pre-eclampsia to diagnose PPCM in advance [6].

For this reason, the American Heart Association recommends that patients with a history of pre-eclampsia undergo a routine cardiovascular examination (The American Heart Association).

Another important issue is that peripartum cardiomyopathy may occur without any history of cardiac diseases in the mother, despite the normal cardiac care during pregnancy. In the case of this study, the mother had no sign of cardiac issues during the routine prenatal care visits and heart counseling at the center. Considering the few data available on the disease, the risk factors and predisposing factors are also changing.

Formerly, a high number of parturitions was known as a risk factor for cardiomyopathy, however, recent studies suggested that the risk of this cardiac disease is more than 50% in grade 1 and 2 women [6]. In addition, the study of patients with cardiomyopathy showed that 25% of them had a history of preterm childbirth.

Conclusion

Reporting this case can be beneficial for reminding the importance of paying attention to the cardiac symptoms of pregnant women and highlighting this critical clinical condition to the health care staff. It is very important to consider the diagnosis of peripartum cardiomyopathy in pregnant women, especially those with dyspnea. Moreover, considering the risk factors and accurate evaluation of predisposed patients can be helpful in preventing PPCM.

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