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Dilated Cardiomyopathy in Pregnancy in a Tertiary Center

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Abstract: ***Dilated cardiomyopathy DCM during pregnancy is a rare but serious condition where the heart becomes enlarged and weakened, affecting its ability to pump blood effectively. The increased blood volume and cardiac demands in pregnancy can worsen the condition, leading to complications such as heart failure, arrhythmias, and in severe cases, maternal or fetal death. In this case report, a 30yearold woman at 36 weeks gestation with a history of anemia and prior Csection was diagnosed with DCM following a cesarean section. She experienced acute breathlessness, and further tests revealed significant cardiac dysfunction with a left ventricular ejection fraction LVEF of 2530%. She was treated with oxygen, diuretics, and medications to stabilize her condition. The patient was closely monitored, and ongoing follow up with echocardiography and cardiac MRI was recommended. Early diagnosis and careful management are essential in improving outcomes for pregnant women with DCM, and this case highlights the need for multidisciplinary care in such high-risk pregnancies.***

Keywords: Dilated cardiomyopathy, pregnancy, heart failure, maternal health, case report

1. Introduction

Dilated cardiomyopathy DCM during pregnancy is a rare but serious condition where the heart becomes enlarged and weakened, affecting its ability to pump blood effectively. The increased blood volume and cardiac demands in pregnancy can worsen the condition, leading to complications such as heart failure, arrhythmias, and in severe cases, maternal or fetal death. In this case report, a 30yearold woman at 36 weeks gestation with a history of anemia and prior Csection was diagnosed with DCM following a cesarean section. She experienced acute breathlessness, and further tests revealed significant cardiac dysfunction with a left ventricular ejection fraction LVEF of 2530%. She was treated with oxygen, diuretics, and medications to stabilize her condition. The patient was closely monitored, and ongoing followup with echocardiography and cardiac MRI was recommended. Early diagnosis and careful management are essential in improving outcomes for pregnant women with DCM, and this case highlights the need for multidisciplinary care in such highrisk pregnancies.

Presentation of Case

The patient 30 year G2P1L1A1 at 36.2 weeks gestation with previous 1 LSCS and chronic anemia came to our center with complaints of pain in abdomen. Upon examination, the patient appeared pale with no edema. Her pulse rate was 106/min, blood pressure 110/70 mmHg, and cardiovascular sounds were normal, Respiratory sounds were clear (AEBE), and the abdominal examination revealed a full-term uterus with scar tenderness. On pelvic examination, she was 2 cm dilated and poorly effaced. Patient was taken up for emergency LSCS due to scar tenderness. Her hemoglobin level was 8.9, and she received one unit of blood preoperatively and another intraoperatively with Lasix cover. Patient withstood the procedure well, post operative monitoring done found within normal limit.

On postoperative day 6, the patient reported acute breathlessness.

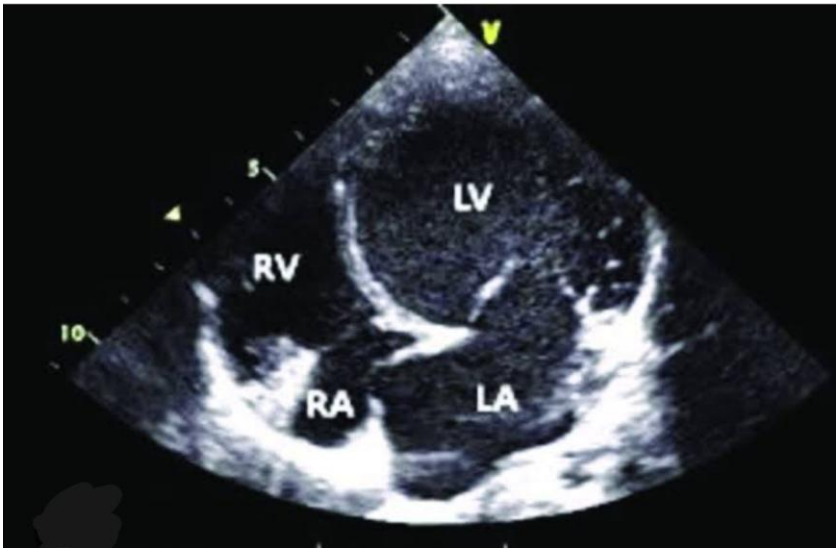
The patient has moderate GC and is afebrile. Pulse rate is 104/min, and blood pressure is 150/100 mmHg. Oxygen saturation is 90% on room air, patient was pale, bilateral pedal edema noted. Cardiovascular system examination shows normal S1S2 without murmurs. Respiratory system shows bilateral crepitations in the basal areas. Abdominal exam reveals a soft, well-contracted uterus, with no guarding or tenderness. The patient was kept on 4L of oxygen via face mask, Foley catheterization was done 1000 mL of clear urine drained, and IV Lasix 40 mg was administered stat.

The patient's blood pressure and pulse were monitored, and she was started on 5 mg of amlodipine. She was stabilized, and an ECG and 2D echocardiogram were performed. The echocardiogram revealed dilated left ventricle with global hypokinesia and an LVEF of 25-30%, while other chambers were of normal size. The walls, interatrial septum, and interventricular septum were intact. There was mild mitral regurgitation, but no aortic regurgitation or pulmonary artery hypertension. The

patient was prescribed Met XL 25 mg OD and Lasix 25 mg OD. She was monitored and then discharged with instructions to follow up with a 2D echo and cardiac MRI in two weeks.

2. Discussion

Cardiomyopathy refers to a myocardial disorder characterized by structural and functional abnormalities of the heart muscle, occurring without the presence of coronary artery disease, hypertension, valvular disease, or congenital heart conditions sufficient to explain the myocardial dysfunction . Cardiomyopathies may be acquired or hereditary and encompass various types, including hypertrophic cardiomyopathy (HCM), arrhythmogenic right ventricular cardiomyopathy (ARVC), left-ventricular non-compaction, restrictive cardiomyopathy (RCM), and dilated cardiomyopathy (DCM). DCM represents a diverse group, including idiopathic and inherited forms, and can be triggered by factors such as viral infections, inflammatory diseases, tachycardia, storage disorders, toxic substances (like alcohol and certain drugs), and Takotsubo cardiomyopathy. Peripartum cardiomyopathy (PPCM), the most common cardiomyopathy during pregnancy, is often categorized under DCM.



The mortality rate for peripartum cardiomyopathy ranges from less than 2% to 50%. There are limited reports on dilated cardiomyopathy in pregnancy, involving a small number of patients, with high-risk individuals experiencing ventricular arrhythmias, heart failure, stroke, and death in 39% to 60% of cases. Nonetheless, patients with moderate left ventricular dysfunction and good functional status generally tolerate pregnancy well. Studies of over 700 pregnancies in 500 women with hypertrophic cardiomyopathy show generally favorable outcomes, despite three reported deaths among high-risk patients. Complications in these cases include various arrhythmias, heart failure, and ischemic stroke. Recent research on 200 pregnancies in 100 women with arrhythmogenic right ventricular cardiomyopathy indicates that 18% to 33% of pregnancies experienced heart failure symptoms, with ventricular tachycardia present in 0% to 33% of cases and syncope in one patient. Information on rarer cardiomyopathies is limited and primarily found in case reports. It is recommended that patients receive close monitoring from multidisciplinary teams at referral centers, with preconception counseling and ongoing care throughout pregnancy as per Schaufelberger et al.

This life-threatening condition often arises during pregnancy and requires management in an intensive care unit, as it can occur at any stage. Pulmonary edema is characterized by fluid accumulation in the alveolar space, impaired gas exchange, oxygen desaturation, and CO2 retention, which ultimately leads to generalized tissue hypoxia, acidosis, and potentially death.

Cardiomyopathy linked to pregnancy was first reported over fifty years ago. Due to its rarity and geographical variations, the clinical characteristics of this condition remain inadequately defined.

We reviewed data from 123 women diagnosed with cardiomyopathy during pregnancy or the postpartum period. Among these, 100 met the standard criteria for peripartum cardiomyopathy, while 23 were identified with pregnancy-associated cardiomyopathy before the last month of gestation. The peripartum group had a mean age of 31±6 years, predominantly white (67%). Common comorbidities included gestational hypertension (43%), tocolytic therapy (19%), and twin pregnancies (13%). The left ventricular ejection fraction at diagnosis averaged 29±11%, improving to 46±14% ($P \leq 0.0001$) at follow-up. Ejection fraction normalized in 54% of patients, particularly in those with an initial ejection fraction >30%. The maternal mortality rate was 9%. Comparisons between the peripartum and early pregnancy-associated cardiomyopathy groups showed no significant differences in age, race, comorbidities, ejection fraction at diagnosis, recovery rates, or maternal outcomes. This study clarifies the clinical profile of women with pregnancy-associated cardiomyopathy in the U.S. The presentation and outcomes for those diagnosed early in pregnancy resemble those of traditional peripartum cardiomyopathy,

suggesting that these conditions may represent a continuum within the same disease spectrum

Besides cardiac diseases, other factors that can contribute to pulmonary edema include fluid overload, pre-eclampsia, eclampsia, congestive heart failure (CHF), chorioamnionic infection, and beta-agonist use.

The pharmacological treatment of pulmonary edema, apart from diuretics, varies depending on the underlying cardiac condition. For critical mitral stenosis (MS) with a typically normal left ventricular ejection fraction, the preferred treatment is rate control using beta-blockers, calcium channel blockers, or digoxin, in that order. For regurgitant lesions such as mitral regurgitation (MR) and aortic regurgitation (AR), afterload reduction is essential to improve cardiac output, with nitroglycerin and sodium nitroprusside being the primary agents used.

In patients with dilated cardiomyopathy (DCM) and reduced ejection fraction, treatment focuses on avoiding fluid overload, administering diuretics (preferably intravenously), morphine, dobutamine to enhance cardiac contractility, and nitroglycerin to decrease afterload resistance.

3. Conclusions

The most common complications during pregnancy in cardio- myopathy are heart failure and arrhythmia. The rates of peripartum cardiac and obstetrical events were 23% and 46%, respectively. Cardiovascular events were more frequent in women with NYHA class II, advanced diastolic dysfunction, and those treated with ACE-I/ARB and diuretics before pregnancy, as well as those using diuretics during pregnancy. Experiencing cardiovascular events during pregnancy was linked to a higher risk of subsequent events within three years post-delivery, underscoring the need for close monitoring in later life, especially for women with peripartum cardiac complications. The underlying cause of heart failure is crucial for prognosis in patients with unexplained cardiomyopathy. Specifically, those with peripartum cardiomyopathy generally have a more favorable prognosis compared to patients with other types of cardiomyopathy. In contrast, those with cardiomyopathy resulting from infiltrative myocardial diseases, HIV infection, or doxorubicin therapy tend to have a significantly worse prognosis.

If left untreated, iron deficiency not only impairs psychomotor development, but may also lead to life-threatening heart disease, such as dilated cardiomyopathy with impaired left ventricular func- tion and heart failure. An Hb < 7 g/dL initially leads to hyperdynamic contractility of the left ventricle and, with an Hb < 5 g/dL, most likely to dilated cardiomyopathy.

Conflicts of Interest: There are no conflicts of interest.

Abbreviations
G -Gravid
P-Parity
L-Living
A-Abortion
DCM-Dilated Cardiomyopathy
PPCM-. Peripartum cardiomyopathy

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