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Case Report

Dilated cardiomyopathy and pregnancy outcome: a case report

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ABSTRACT

Cardiomyopathy is a group of diseases that affect the heart muscle. Dilated cardiomyopathy, a form of cardiomyopathy, is characterised by ventricular chamber enlargement and contractile dysfunction, and has recurrences in subsequent pregnancies. Pregnancy by itself is associated with significant hemodynamic burden and cardiovascular changes, which when coupled with dilated cardiomyopathy results in increased morbidity and mortality in both mother and child. Management of such a condition presents serious therapeutic challenge to a multidisciplinary team. Here, we report a case of a 36-year-old woman primigravida with gestational age of 11 weeks, known case of dilated cardiomyopathy. Despite the risks and associated complications with the disease, she continued her pregnancy. Patient was managed by a team of obstetrician, cardiologist and anaesthesiologist and underwent caesarean section giving birth to a live baby. The aim of this article is to provide guidance on how to manage a patient with dilated cardiomyopathy throughout her pregnancy. Early diagnosis of heart disease, regular antenatal check-ups, institutional delivery and multidisciplinary approach can reduce the maternal and perinatal morbidity and mortality.

Keywords: Pregnancy, Heart disease, Dilated cardiomyopathy, Caesarean section

INTRODUCTION

Cardiovascular disease complicates 1% to 3% of all pregnancies and accounts for 10% to 15% of maternal mortality.[1] Plasma volume and cardiac output increase by 40-50% and 30-50%, respectively during pregnancy and the ability to adjust to these dynamic changes is of great clinical importance, especially in pregnant women with decreased cardiac function.[2] The World Health Organization therefore advises against pregnancy in women with a left ventricular ejection fraction (LVEF) less than 30%.[3,4] Dilated cardiomyopathy (DCM) is characterized by enlargement and dilation of one or both of the ventricles along with impaired contractility defined as LVEF less than 40%. Diagnosing DCM during pregnancy is difficult since the clinical features may mimic the symptoms of a normal pregnancy. Hence, identification of systolic dysfunction and left ventricular dilatation using echocardiography (ECHO) is diagnostic for DCM. Adverse cardiac events are more common in DCM complicated with pregnancy and worsen with subsequent pregnancies.

Also, the prognosis is much worse than the non-pregnant counterparts.[5] Furthermore, fetal and neonatal complications are more common in pregnant women with DCM. As a result, early termination of pregnancy is an option that can be undertaken to prevent further deterioration of cardiac function by evading the 'stress and burden of pregnancy'.[6]

We report a case of a pregnant woman diagnosed with DCM and the subsequent management and successful delivery.

CASE REPORT

A 36-year-old primiparous woman with amenorrhea for 11 weeks and a known case of DCM and hypertension for the past 2 years came to outpatient department. Her last menstrual period was on 30 December 2020 and her expected date of delivery was 6 September 2021. She was taking amlodipine 5 mg once daily, bisoprolol 5mg once daily and aspirin 75 mg once daily. Her ECHO done 1 year back showed an LVEF of 40%.

Antenatal period

During her 1st antenatal check-up in her 11th week of pregnancy, her functional status was New York Heart Association (NYHA) class I. An ECHO was done which showed an LVEF of 33%, global hypokinesia, mild mitral regurgitation (MR), left ventricular internal diameter end diastole (LVIDd) of 6.19 cm. Risks involved in continuation of pregnancy was discussed, however patient decided to continue the pregnancy. All her routine investigations and obstetric ultrasound was normal. Patient was managed by a multidisciplinary approach involving obstetrician and cardiologist. She was treated with loop diuretic (torsemide 5 mg daily), antiplatelet (aspirin 75 mg daily) and beta blocker (metoprolol extended release 25 mg daily) and was advised to follow up at cardiology and antenatal clinic every month or whenever required. She continued to come for regular antenatal and cardiology check-ups.

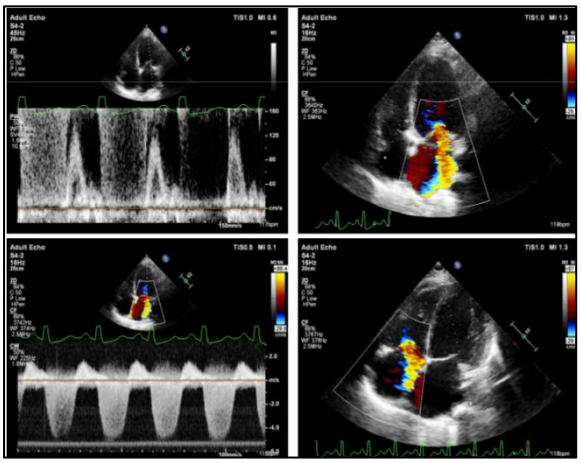

Figure 1: ECHO at 36th week gestation.

The patient's health condition was stable until the 30th week of pregnancy when she developed breathing difficulty, cough and orthopnoea. Physical examination revealed pallor, heart rate 170/min, arterial blood pressure 140/90 mmHg, bilateral crepitations and a gallop rhythm. Gynaecological examination showed no visible pathology and uterine cervix was closed. Obstetric Ultrasound was normal. Patient was diagnosed as worsening heart failure and was admitted in ICU. Laboratory test results were in normal range, except for haemoglobin of 8gm/dl. An ECHO done on the same day was consistent with dilated cardiomyopathy, severe LV systolic dysfunction (LVEF 23%), global hypokinesia, with grade 3 diastolic dysfunction, severe MR and moderate tricuspid regurgitation (TR). Diuretic was escalated. Steroid injections were given for fetal lung maturity. 1 unit of packed red blood cells was given in view of low haemoglobin. Patient responded favourably to the medications. She was discharged after 5 days and asked to follow up after a week.

The patient's condition was satisfactory over the following weeks. However, at the 36th gestational week she was hospitalized again with increased breathing difficulty and sleeplessness. Repeat ECHO (Figure 1) on the same day showed EF of 21%, severe MR, severe TR, mild pulmonary arterial hypertension, and grade III diastolic dysfunction. Haemoglobin was 8.4gm/dl. On examination there was no uterine contractions. Foetal non stress test (NST) remained reactive, foetal heart sounds were regular and normal. Patient was admitted and continued on β-blocker (Metoprolol 25 mg/day), loop diuretic (torsemide 10mg twice a day) and other supportive medications. 1 unit of packed red cells was transfused. Despite the treatment the patient's condition did not fully improve.

A joint consultation involving a cardiologist, an obstetrician and an anaesthesiologist was conducted and it was decided to end the pregnancy by caesarean section in view of decompensated cardiac status and to deliver the baby urgently. Patient underwent caesarean section under epidural anaesthesia (ropivacaine with fentanyl). Despite patient counselling for tubal ligation, she refused for the same. A healthy female child weighing 2600 gms was born. Baby cried right after birth. Apgar score was 9 at 1 minute and 10 at 5 minutes.

Perioperative period

Pre-operative assessment of the patient was done by the anaesthesiologist and the patient was explained about the high risks of anaesthesia due to her underlying cardiac condition such as intraoperative arrythmias, congestive cardiac failure, on table cardiac arrest etc. Epidural anaesthesia was planned in order to avoid sudden hemodynamic variations associated with subarachnoid block and an informed written consent was obtained from the patient.

Intra operative monitoring included continuous ECG, non-invasive blood pressure (NIBP), blood oxygen saturation (SpO2). In addition to a 18G peripheral venous cannula, central venous access was secured under local anaesthesia in the right internal jugular vein using a triple lumen central venous catheter, to monitor central venous pressure (CVP).

Co-loading with 200 ml of lactated Ringer's solution was done during the insertion of the epidural catheter. The epidural catheter was inserted in the sitting position at L2-3 level using an 18-gauge Tuohy needle. The depth of the

epidural space was at 5 cm and the catheter was fixed at 10 cm. The epidural catheter insertion was uneventful and the patient was slowly made to lie supine with a lateral uterine tilt. Incremental doses of 0.5% Ropivacaine was administered slowly in 4-5 ml aliquots with a total of 15 ml with 100 mcg of Fentanyl injection. After ensuring adequacy of the block up to T6 dermatomal level, the surgery was performed. The patient was hemodynamically stable throughout the entire intraoperative period. After the delivery of the baby 10 IU of Oxytocin in 500 ml NS was infused slowly to facilitate uterine contraction.

Post-natal period

Postoperatively, the patient was kept in the intensive care unit (ICU) for monitoring. Post-operative analgesia was maintained through continuous epidural infusion of 0.1% ropivacaine with 2 mcg/ml fentanyl at the rate 5 ml/hour. The patient was continued on antibiotics and furosemide. Only clear oral fluids were allowed and no intravenous fluids were given in order to restrict fluid overload to heart. The patient responded to the management and had an uneventful recovery. Patient was discharged on torsemide and beta blockers. Patient came for follow up with both obstetrician and cardiologist two weeks after delivery. Contraceptive advice was given to the patient at the post-natal check-up and counselled against future pregnancy.

DISCUSSION

The incidence of cardiovascular disease in pregnancy is increasing because more women with congenital or acquired heart disease are reaching childbearing age due to improved medical and surgical care, and they desire children. Hemodynamic changes begin to appear in the first trimester and continue in the second and third trimester.[7] A healthy pregnant woman can adapt to these physiological changes. However, in pregnant woman with heart disease, these hemodynamic changes can put an immense strain on the heart and worsen the cardiac condition as seen in our case.

The maternal and fetal outcome depends upon the type and severity of valvular abnormality, NYHA functional status, left ventricular ejection fraction and pulmonary pressure.[8,9]

To assess the maternal risk of cardiac complications during pregnancy, the condition of the woman should be evaluated taking into account her medical history, functional class, and echocardiography assessment of ventricular and valvular function. Clinical and echocardiography follow-up is indicated monthly or bimonthly depending on hemodynamic parameters.

Echocardiography was used as the single most effective tool to assess the condition of the heart during pregnancy. The first echocardiography after conception showed an ejection fraction of 33%. However, as her pregnancy progressed, her ejection fraction began to fall, and it reached 21% in the last echocardiography done just before her delivery. A caesarean section was undertaken to prevent further deterioration of heart function due to the stress of vaginal delivery.

Management of labour, delivery and post-partum surveillance require specific expertise and collaborative management by skilled cardiologists, obstetricians and anaesthesiologists.

Thus, the patient with heart disease needs a multidisciplinary approach for favourable outcome.

CONCLUSION

Pregnancy in women with DCM is a high-risk situation and presents a serious therapeutic challenge. The third trimester appears to be the most susceptible period when maternal and foetal status can decline rapidly, the risks can be minimised in women by early multidisciplinary approach (consisting of an obstetrician, a cardiologist, and an anaesthesiologist). Proper cardiac and obstetric management is recommended in a tertiary care centre for achieving optimal maternal and fetal outcome. Patient should be properly counselled regarding morbidity and mortality. Cardiologist consultation should be taken during antenatal check-ups, in labour and in puerperium. As there is a chance of preterm delivery, steroids should be given in time to the mother for fetal lung maturity. Providing timely investigations, proper treatment with multidisciplinary approach and regular follow up will ensure safe delivery of a child to a mother with DCM. Particular attention must also be paid to avoid fluid overload in the early postpartum period, when auto transfusion from uterus can worsen underlying hemodynamics.

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REFERENCES

1. Nanna M, Stergiopoulos K. Pregnancy Complicated by Valvular Heart Disease: an Update. J Am Heart Assoc Cardiovasc Cerebrovasc Dis. 2014;3(3):e000712.
2. Pritchard JA. Changes in the blood volume during pregnancy and delivery. Anesthesiology. 1965;26:393-9.
3. Thorne S, MacGregor A, Nelson-Piercy C. Risks of contraception and pregnancy in heart disease. Heart. 2006;92:1520-5.
4. Regitz-Zagrosek V, Roos-Hesselink JW, Bauersachs J, Blomström-Lundqvist C, Cífková R, De Bonis M, et al. ESC guidelines for the management of cardiovascular diseases during pregnancy. Eur Heart J. 2018;39:3165-241.
5. Grewal J, Siu SC, Ross HJ. Pregnancy Outcomes in Women With Dilated Cardiomyopathy. J Am Coll Cardiol. 2010;55:45-52.

6. Katsuragi S, Omoto A, Kamiya C. Risk factors for maternal outcome in pregnancy complicated with dilated cardiomyopathy. J Perinatol. 2012;32:170-5.
7. Kannan M, Vijayanand G. Mitral stenosis and pregnancy: Current concepts in anaesthetic practice. Indian J Anaesth. 2010;54:439-44.
8. Bonow RO, Carabello BA, Chatterjee K, de Leon Jr AC, Faxon DP, Freed MD, et al. Focused Update Incorporated Into the ACC/AHA 2006 Guidelines for the management of patients with valvular heart disease: a report of the Ameri¬can College of Cardiology/American Heart Asso¬ciation Task Force on Practice Guidelines (Writ¬ing Committee to Revise the 1998 Guidelines for the Management of Patients With Valvular Heart Disease). Endorsed by the Society of Cardiovascu¬lar Anesthesiologists, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol. 2008;52(13):e1-142.
9. Reimold SC, Rutherford JD. Valvular heart disease in pregnancy. N Engl J Med. 2003;349(1):52-9.

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