Reminder of important clinical lesson

Chest pain, breathlessness and ST elevation in a 21-weeks' pregnant woman: a diagnostic and management challenge

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Summary

This case highlights the importance of differentiating between normal physiological changes of pregnancy and symptoms that are pathological. It discusses the presentation of heart failure during pregnancy and the differential diagnoses that should be considered. It also highlights the difficult management decisions that may have to be made in order to protect maternal health.

BACKGROUND

The final diagnosis in this case was a rare pregnancy related cardiac disease, but the presenting symptoms and clinical findings are common. Although the clinical presentation of heart failure should be easily recognised, in pregnancy it is often misdiagnosed. Differentiating between physiological and pathological symptoms in pregnancy can be difficult, and doctors often feel trepidation when presented with this uncommon clinical scenario. We feel that this case highlights the pitfalls of diagnosing heart disease in pregnancy and also illustrates the need for a multidisciplinary approach to managing these patients.

CASE PRESENTATION

A previously fit and well 28-year-old, 21-week primigravida woman presented with a 2-week history of exertional chest pain and breathlessness. The patient also had orthopnoea and paroxysmal nocturnal dyspnoea (PND). Her general practitioner felt that these symptoms were attributable to her pregnant state, but when the patient attended the antenatal clinic she was noted to be overtly breathless. The patient was therefore transferred urgently to our Casualty department. On examination the patient was breathless at rest, apyrexial, hypotensive and tachycardic.

INVESTIGATIONS

Arterial blood gases showed hypoxia (PaO₂ 7.7 kPa, FiO₂ 60%). A CT pulmonary angiogram was performed, which was normal. A chest x-ray showed patchy shadowing consistent with infection or fluid. An initial transthoracic echo (TTE) was reported to be normal, with an estimated left ventricular ejection fraction (LVEF) of 50%. However, subsequent review of the TTE images by a consultant cardiologist confirmed impaired LV function. Although the LVEF was 50% this was subnormal for what is a hyperdynamic state. Serial electrocardiograms (ECGs) showed right bundle branch block (RBBB) with 1–2 mm ST elevation

anteriorly. Her troponin level was 3.7 µg/ml. Emergency coronary angiography showed non-obstructed normal coronary arteries with an LV end diastolic pressure of 40 mm Hg. Autoimmune and virology screens were normal.

DIFFERENTIAL DIAGNOSIS

Symptoms of orthopnoea and PND are suggestive of LV failure, which presenting acutely in pregnancy may be due to:

- ▶ Myocardial infarction secondary to atherosclerotic coronary artery disease, coronary dissection or thrombosis in situ.
- ▶ Pregnancy associated cardiomyopathy (PACM).
- ▶ Myocarditis (viral/autoimmune).
- ▶ Pulmonary thromboembolism (associated with haemodynamic compromise).

TREATMENT

The patient was transferred to the cardiac intensive therapy unit, but despite initial improvement escalating circulatory and respiratory support was required. The patient developed ventricular dysrhythmias and required direct current cardioversion. The patient was electively intubated but remained haemodynamically unstable.

Following input from the obstetric and neonatology specialists of the high-risk pregnancy team, the decision was made to deliver the non-viable fetus in order to prevent maternal death. The patient was transferred to a cardiac transplant centre to deliver, with left ventricular assist device (LVAD) support available if needed.

OUTCOME AND FOLLOW-UP

The patient underwent induction of labour and vaginal delivery without complication or need for LVAD support. The patient was discharged home 20 days post delivery, taking an angiotensin-converting enzyme inhibitor, spironolactone and warfarin. At 3-month follow-up the

patient was asymptomatic and well. Echocardiography demonstrated normal LV function.

DISCUSSION

The most likely diagnosis in this case was PACM, although this is speculative as there is no knowledge of prepregnancy LV function. This is a rare diagnosis and other possible causes of cardiomyopathy must be excluded. There was no family history suggestive of a familial cardiomyopathy, which can be exacerbated by pregnancy. There was no history of acute viral myocarditis (normal inflammatory markers and virology negative for myopathic pathogens). The finding of angiographically normal coronaries excluded coronary dissection and atherosclerotic coronary disease. A thrombosis in situ that had resolved was also unlikely given the time interval between presentation and angiography. PACM is therefore the most likely diagnosis. This is a cardiomyopathy that presents with symptoms and signs of heart failure during pregnancy in the absence of pre-existing LV dysfunction or determinable cause of cardiomyopathy.¹ ² LV function must be depressed with an ejection fraction of <45%. Also known as peripartum cardiomyopathy, commonly presenting in the final gestational month or up to 5 months postpartum, it soon became recognised that some cases presented earlier in pregnancy. It is therefore now accepted that cardiomyopathy in pregnancy represents a continuum of disease spectrum. Risk factors for developing the condition are age >30 years, multiparity, black ethnicity, multiple gestation, obesity, pre-eclampsia and chronic hypertension. The earlier the presentation, the higher the rate of fetal death and premature delivery.³ It is also associated with important maternal morbidity and mortality of up to 10% are reported. Prompt diagnosis and treatment are therefore crucial.

Learning points

- Pregnant women with heart disease often present late due to a failure to discriminate between physiological and pathological symptoms in pregnancy. Progressive symptoms of shortness of breath, orthopnoea and paroxysmal nocturnal dyspnoea (PND) should, however, always be considered pathological until proven otherwise.
- ST-wave and T-wave changes may be present in myocardial injury of any aetiology.
- Echocardiography in pregnant women is difficult with limited acoustic windows but a left ventricular ejection fraction (LVEF) of <55% must be considered abnormal especially as pregnancy is a hyperdynamic circulatory state.
- Maternal health is usually prioritised over that of the unborn child, but terminating a pregnancy for the sake of maternal health is a major management decision. It should therefore be made after input from a specialist multidisciplinary pregnancy team, so that the parents are making an informed choice and the rationale is understood by all parties.

Acknowledgements The authors thank Ms Ruth Brooks, GUCH clinical nurse specialist for the high-risk pregnancy service for her help with this case.

Competing interests None.

Patient consent Obtained.

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Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Butcher CJ, Plymen CM, Walker F. Chest pain, breathlessness and ST elevation in a 21-weeks' pregnant woman: a diagnostic and management challenge. *BMJ Case Reports* 2010;10.1136/bcr.03.2010.2853, date of publication

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