and an exceptionally high serum βhCG concentration are diagnostic.

Exceptionally high serum and urine βhCG concentrations can interfere with the assay employed by pregnancy tests giving false negative results (Tabas et al. 2003; Wisdom et al. 1994). This may give clinicians false reassurance in the presence of a molar pregnancy. Most pregnancy tests both urine and serum, utilise the immunometric technique known as the 'sandwich assay'. It is a variant of the antigen antibody reaction where antibodies raised against two different sites on the hCG molecule are used. The first is an antibody in the solid phase that is attached to a bead or plate and the second antibody is labeled with a tracer and is in the liquid phase. On addition of a sample containing βhCG to this assay system, the two antibodies are linked together upon binding with the βhCG molecule. This test therefore requires intact hCG molecules for accurate results. The sandwich assay is more specific and sensitive than the single antibody assay (Wisdom et al. 1994).

Very high βhCG concentrations can interfere with immunoassay systems, resulting in low βhCG quantification or false negative results. This is attributable to the 'hook' or prozone effect, which describes the inhibition of immune complex formation by excess antigen. Very high antigen concentrations in the patient sample bind to all available antibody sites, saturating both the solid phase and the liquid phase labeled antibody, thereby preventing the 'sandwich' formation. Under these conditions, the measured level of antigen may be significantly lower than the actual level present in the sample. This high dose hook effect can be overcome by repeating the test after appropriate dilution of the serum or urine sample (Wisdom et al. 1994).

Rare as these cases might be, they highlight a significant clinical principle – treat patients, not test results. Even the most established tests like a pregnancy test do have a false negative rate that might lead to misjudgements even in the presence of a characteristic clinical picture as in the case presented. In addition to βhCG assays, the high dose hook effect has also been demonstrated in hormonal assays measuring prolactin and thyrotropin, as well as in immune-based techniques used in the measurements of CA125 and prostrate specific antigen.

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Is labour safe in infective endocarditis patients with septic lung embolism?

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Case report

A 28-year-old multiparous woman with a history of intravenous heroin abuse, presented at 29 weeks' gestation with acute shortness of breath, pleuritic chest pain and haemoptysis. She was febrile, with tachycardia and tachypnoea. Investigations showed hypoxia, multiple bilateral opacities on CXR and a CRP >250. A VQ scan suggested a high probability of pulmonary embolism. Tinzaparin and augmentin were commenced.

Sputum and blood cultures grew *staphylococcus aureus*. An echocardiogram showed large mobile vegetation on the tricuspid valve, with a potential high risk of thromboembolism. The ventricular function was good (ejection fraction of 61%). The diagnosis was revised to infective endocarditis with septic lung embolism causing staphylococcal lung abscesses. Treatment was changed to intravenous flucloxacillin for 6 weeks. Although her symptoms improved on treatment, discontinuing antibiotics caused recurring night sweats and a rising CRP. Repeat echocardiogram showed that the tricuspid vegetation was persisting and measured 1.5×0.8 cm. The patient was now 36 weeks with normal fetal growth on serial scans. The decision to induce labour was made to facilitate further management of the incompletely resolved infective endocarditis. She had an uncomplicated normal delivery 6 h following induction. The baby was discharged from SCBU after 2 days. The patient was followed-up by the cardiologists.

Discussion

There is little literature on the management of pregnant patients with infective endocarditis and embolic lung complications. Intravenous drug abuse, *staphylococcus aureas* and endocarditis is a well recognised triad. The maternal and fetal mortality are 22.1% and 14.7%, respectively (Campuzano et al. 2003).

Standard treatment is appropriate antibiotic therapy for 6 weeks. Serious complications include heart failure, embolism to the lungs, coronary and middle cerebral arteries. Valve replacement is considered in unresponsive patients, those with multiple emboli, or those with a large mobile vegetation >10 mm (Beynon et al. 2006).

Quantifying risk of embolism and heart failure in individual patients is difficult. Our worry was whether these risks would be increased by the haemodynamic changes of labour, such as increased venous return and central venous pressure.

Cases of vaginal delivery have been reported but only after adequate medical treatment and shrinkage of the vegetation. Reports of elective caesarean to expedite valve replacement have been published (Ishibashi et al. 1994).

In our patient, induction of labour and vaginal delivery was undertaken, despite inadequate resolution of the vegetation. Risks of congestive heart failure and systemic embolism with tricuspid vegetations are small compared with aortic and mitral valve lesions. These risks are greatest within the first 2–4 weeks of antimicrobial therapy (Baddour et al. 2005.) Here, the lesion was right-sided, cardiac function was good and 7 weeks had elapsed since the beginning of treatment. Hence, labour was felt to be safe and the outcome was successful.

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A difficult delivery associated with a nuchal cord found nine times around the fetal neck

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Case report

A 44-year-old woman was admitted to University Hospital, Lewisham, with a history of pre-term premature rupture of membranes at 28 weeks' gestation. She had previously had two spontaneous vaginal deliveries, both at 39 weeks, and a miscarriage at 10 weeks' gestation. At 27 weeks' gestation the patient was found to have increased liquor volume. The fetal anatomy was normal, but she was subsequently found to have impaired glucose tolerance.

The patient presented with a history of a watery vaginal discharge. No liquor was seen draining on speculum examination and there was no evidence of infection. The patient was managed conservatively and given dexamethasone. By the morning, clear liquor was seen on her pad. The pregnancy progressed until 30 weeks and 4 days' gestation, when she experienced abdominal tightenings and was noted to have variable decelerations on the cardiotocogram (CTG). Vaginal examination revealed a closed cervical os. The abdominal tightenings were irregular and good fetal movements were felt. The variable decelerations became more frequent and a decision was made to deliver the baby by emergency caesarean section for presumed fetal distress. A lower segment uterine incision was made. Delivery of the head at caesarean section was difficult. Wrigley's forceps were applied easily, but even with the forceps it was very difficult to advance and deliver the fetal head due to a short umbilical cord. On delivery of the head, a tight umbilical cord was found round the fetal neck nine times. This was divided, which then allowed delivery of a male infant weighing 1.375 kg. The baby cried at birth and had Apgar scores of 8 at 1 min and 10 at 5 min. The umbilical cord gases were within normal limits. The baby was transferred to the SCBU and the subsequent postnatal days were uneventful.

Discussion

There are many causes of an abnormal CTG. Umbilical blood flow is influenced by cord compression from cord prolapse, cord knots and nuchal cord.

This case is a good example of the multifactorial aetiology of pregnancy complications. This patient had proven polyhydramnios that may have given rise to increased fetal mobility *in utero* and subsequent coiling of the cord. Nuchal cord is reported to occur in 5–29% of all pregnancies (Larson et al. 1997). It is recognised that nuchal cord is an established cause for increased nuchal thickness, intrauterine growth retardation, abnormal CTG, neonatal anaemia and neonatal hypovolaemia. In babies with a nuchal cord, there is a higher incidence of Apgar scores of less than 7 at 1 min, meconium-stained amniotic fluid, emergency caesarean section, need for neonatal resuscitation and admission to the neonatal intensive care unit (Jauniaux et al. 1995).

It is routine practice during vaginal deliveries to feel for a nuchal cord to aid a vaginal delivery. This is not always practiced in caesarean section deliveries. We had difficulty delivering the baby's head, even with forceps, as the non-nuchal umbilical cord was under tension and would not allow transit of the fetus downwards through the lower uterine incision. If we had been aware of the presence of the nuchal cord antenatally, this would have alerted us to the difficulty with advancing the fetal head and allowed us to divide the cord earlier. This would have allowed a safer delivery of the baby. This case is unusual; the highest previously reported number of times an umbilical cord was coiled around the fetal neck was eight (Itakura et al. 1994).

Ultrasonic colour Doppler flow can be used to detect the coiling of the umbilical cord around the fetal neck and it has a high