CLINICAL RESEARCH

Acute fatty liver of pregnancy and diagnosis by computed tomography

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Abstract

A 39 year old woman was admitted to a maternity unit at 34 weeks' gestation with nausea, vomiting, and jaundice. Her condition deteriorated, and she was transferred to hospital, deeply unconscious and hypotensive. The diagnosis of acute fatty liver of pregnancy was initially suggested by the typical history of prodromal malaise and vomiting and the rapid onset of hepatic encephalopathy with profound hypoglycaemia and only small increases in transaminase activities. Computed tomography was performed: there was no enlargement of the liver or spleen, but the attenuation value over the liver indicated appreciable fatty infiltration of the liver, establishing the diagnosis of acute fatty liver of pregnancy.

Computed tomography is of value in the diagnosis of liver disease of late pregnancy, and this technique may become the method of choice for the investigation of acute fatty liver of pregnancy.

Introduction

Acute fatty liver of pregnancy is a rare complication of pregnancy with an incidence of less than one in 10 000 deliveries¹ and associated with a perinatal mortality of 70% and maternal mortality of 80%.² Successful treatment depends on accurate diagnosis and early delivery. Computed tomography may be helpful in the diagnosis of this condition,³ and we report a case in which it proved to be so.

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Case report

A 39 year old patient in her eleventh pregnancy presented to a maternity unit after 29 weeks' amenorrhoea. Clinical and ultrasound examination confirmed the presence of a single fetus corresponding to this period of gestation. She was normotensive and remained so until 30 weeks' gestation when her blood pressure was 170/100 mm Hg. There was no proteinuria. As the patient declined admission she was treated with chlorthalidone 25 mg, potassium chloride, and labetalol 400 mg daily and diazepam intermittently.

The patient was admitted at 34 weeks' gestation with a two week history of nausea and increasing episodes of vomiting without abdominal pain, and she had noticed jaundice over the past two days. She had no history of liver or autoimmune disease or alcohol or drug abuse and no family history of liver disease. Initially she suffered from vomiting and increasing drowsiness, but other clinical variables remained stable. Thirty six hours after admission she rapidly deteriorated, she became confused and unresponsive to verbal commands, and intrauterine fetal death occurred.

The patient was transferred to our hospital and on admission was deeply unconscious and hypotensive with blood pressure varying from 100/50 mm Hg to unrecordable levels. She was slightly jaundiced but had no cutaneous signs of chronic liver disease, hepatomegaly, or ascites, although there was some ankle oedema. The size of her uterus was consistent with 34 weeks of gestation. Ultrasound examination confirmed fetal death and showed no evidence of retroplacental haemorrhage. Investigations showed serum bilirubin concentration 140 $\mu\text{mol/l}$ (8.2 mg/100 ml) (normal range 3-18 $\mu\text{mol/l}$ (0.2-1.1 mg/100 ml)), aspartate aminotransferase activity 357 IU/l (normal range 10-40 IU/l), alanine aminotransferase activity 435 IU/l (normal range 10-45 IU/l), alkaline phosphatase activity 681 IU/l (normal range 35-105 IU/l), and serum urate concentration 0.76 mmol/l (12.8 mg/100 ml) (normal range 0.20 mmol/l (2.5-8.4 mg/100 ml)). There was generalised aminoaciduria and hyperaminoacidaemia with the exception of valine, leucine, and isoleucine, which were normal. Prothrombin time was 35 seconds, but there was no evidence of disseminated intravascular coagulation. Electroencephalogram showed triphasic activity typical of hepatic encephalopathy. Tests for hepatitis B surface antigen and IgM antibody to hepatitis A yielded negative results as did serological tests for cytomegalovirus and Epstein-Barr virus.

Computed tomography (Siemens Somatome DR 3 scanner) showed no enlargement of liver or spleen, but the attenuation value over the liver was 19 Hounsfield units (normal range 50-70 Hounsfield units). This indicated appreciable fatty infiltration of the liver and established the diagnosis. Our plan of management was to resuscitate and stabilise the patient before inducing labour. The hypotension was corrected by dobutamine infusion and hypoglycaemia (plasma glucose 0.2 mmol/l (3.6 mg/100 ml) corrected by dextrose infusion, resulting in some improvement in the degree of con-

sciousness, but she remained unresponsive to commands. During this time she was oliguric with a urinary output of 363 ml/24 hours.

Labour occurred spontaneously 18 hours after admission and rapidly progressed to a normal delivery of a stillborn baby boy weighing 2500 g. After delivery the patient's degree of consciousness improved rapidly, and within an hour she was able to answer questions appropriately. Within the next 24 hours her cardiovascular state improved and the dobutamine infusion was withdrawn as urinary output returned to normal.

Computed tomography of the liver was repeated twice: eight days after admission the attenuation value had risen to 48 Hounsfield units and by 21 days it had returned to normal at 55 Hounsfield units. A liver biopsy was carried out on the twelfth day after admission and showed preservation of the normal architecture with prominent cholestasis, small areas of liver cell necrosis, mild inflammatory infiltrate in the portal areas, and some microvesicular fatty change. These features were consistent with resolving acute fatty liver of pregnancy.

Over the next two weeks results of liver function tests continued to improve and, after an initial rapid fall in aminotransferase activities, returned to normal four weeks after admission. Fifteen months later the patient was still well.

Discussion

The differential diagnosis of a patient presenting with hepatic failure in late pregnancy includes acute fatty liver of pregnancy, acute hepatitis, and deterioration of chronic liver disease. Exact diagnosis, on which management will depend, can often be made only after a liver biopsy has been performed, a procedure that is hazardous if liver failure is associated with coagulation disorders. In our patient the diagnosis of acute fatty liver of pregnancy was initially suggested by the typical history of prodromal malaise and vomiting and the rapid onset of hepatic encephalopathy with profound hypoglycaemia and only small increases in transaminase activities. Although there was some improvement in the degree of consciousness with correction of the hypoglycaemia, the ap-

preciable improvement after delivery was also typical of acute fatty liver of pregnancy.⁴

Computed tomography has been shown to be an accurate method of estimating the fat content of the liver.⁵ It can be used to assess the overall pattern of fatty change and is not prone to sampling errors with non-uniform fat distribution, which may occur in liver biopsy specimens. It is non-invasive and has the advantage of providing an immediate result and may be safely carried out in the presence of coagulation abnormalities. In our patient computed tomography established the diagnosis of acute fatty liver of pregnancy within three hours of admission, thus facilitating her further management.

Computed tomography of the liver in late pregnancy is a fairly safe technique. Studies in our radiology department using an Alderson Rando anthropomorphic phantom show that the incidental dose of radiation from a single 8 mm computed tomographic slice, 6 cm away, at mid-hepatic level results in a dose to the fetus that is less than that given by a single posteroanterior fetal x ray examination (unpublished data).

This case confirms the value of computed tomography in the diagnosis of liver disease of late pregnancy. We consider that further studies are indicated and suggest that this technique may become the investigation of choice for acute fatty liver of pregnancy.

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Detection of lymphocytotoxic antibodies in relatives of patients with type I diabetes

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Abstract

Concentrations of lymphocytotoxic antibodies were measured in serum samples from 19 patients recently diagnosed as having type I diabetes and 43 healthy relatives (33 consanguineous and 10 non-consanguineous). The specificity of the reaction was tested at 15°C and 37°C against T lymphocytes and purified

helper/inducer and cytotoxic/suppressor subsets. The concentrations of lymphocytotoxic antibodies in each of the three test groups were significantly higher than those in controls (type I patients, $p < 0.005$; consanguineous relatives, $p < 0.001$; and non-consanguineous relatives, $p < 0.002$). The frequency of detection of the antibodies was also greater in each of the study groups ($p < 0.01$, $p < 0.01$, and $p < 0.05$, respectively). Cytotoxicity affected both subsets at 15°C but only cytotoxic/suppressor cells at 37°C.

The finding of lymphocytotoxic antibodies in healthy relatives of type I diabetics, irrespective of consanguinity, suggests that an environmental agent such as a virus is at least partially responsible for this lymphocytotoxic effect. Furthermore, the residual cytotoxic/suppressor cell killing at 37°C could explain the defect of suppressor cells observed in these patients.

Introduction

Lymphocytotoxic antibodies occur in several immunological diseases in which viral infection is suspected to play a part in pathogenesis.¹⁻³ Their extensive characterisation in patients with

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