Neonatal diabetes associated with transaminitis in a growth retarded infant

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BACKGROUND

- Severe growth retardation in an infant born prematurely was associated with deranged liver functions evident at birth.
- Hyperglycaemia associated with failure to thrive complicated the neonatal course.
- As cholangiopathy was suspected a liver biopsy was performed to rule out obstructive, infective or metabolic causes.
- The finding of glycogen hepatopathy was unexpected.

CASE DESCRIPTION

- An infant weighing 1.365 kg and gestational age of 34 weeks was delivered by Caesarean section for foetal distress. No dysmorphic features were found.
- Jaundice was noticed at birth with pale stools initially.
- Elevated blood glucose levels were initially attributed to sepsis and managed with the intermittent administration of insulin; persistence of hyperglycaemia (>10 mmol/l) was subsequently managed with insulin infusion.
- Wide fluctuations of the glucose including hypoglycaemia were noted.
- Due to poor subcutaneous tissue, continuous intravenous insulin (0.04 to 0.06 units/kg/day) was administered until the infant gained weight.
- The patient failed to respond to a trial of oral glibencamide (1).
- A normal pancreas, gall bladder and kidney were seen on abdominal ultrasound.
- Although there was non visualization of the hepatobiliary drainage on hepato-IDA scintigraphy, the stools colour improved.

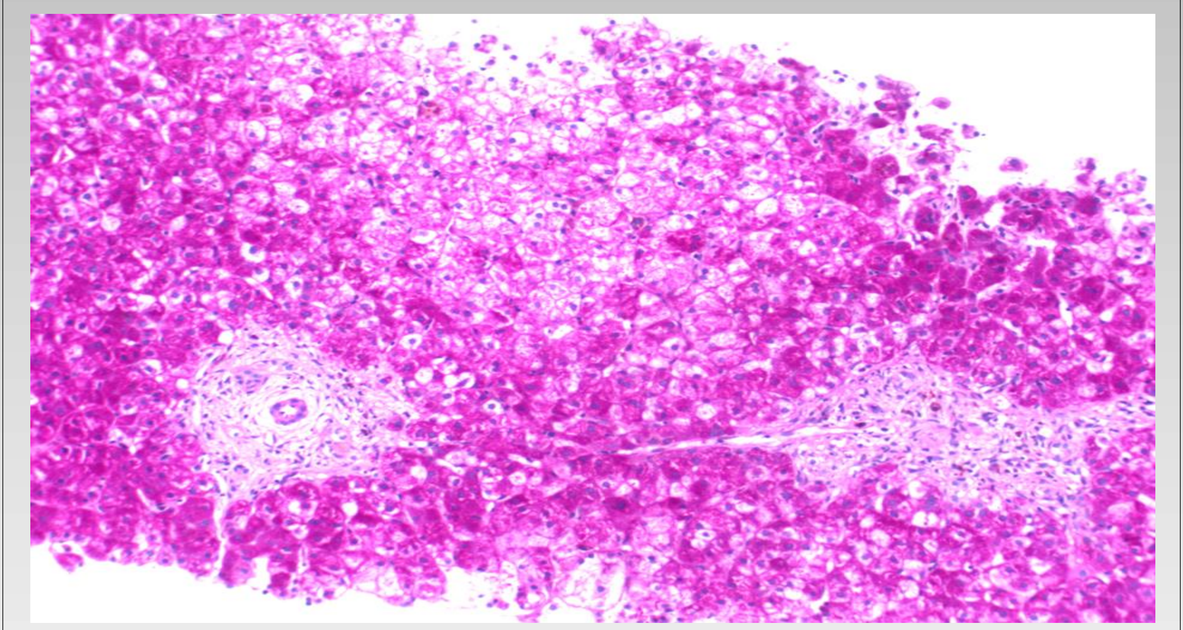
RESULTS

Table : Biochemical and serological investigations

	Birth (day 1)	7 months	16 months
Total Bilirubin (normal reference values)	48	19	3
Conjugated Bilirubin (0-20 umol /L)	24	17	<2
Alanine Transaminase (1-25U/L)	102	282	60
Aspartate Transaminase (0-51 U/L)	228	218	51
Alkaline Phosphatase (75-316 U/L)	142	1503	362
Gamma-glutamyl transferase (12-122 U/L)	1078	3872	49
Insulin (3.0-25.0 mU/l)	<0.5		
C Peptide	0.5		
GAD Antibodies	Negative		
Alpha-1 antitrypsin (1.01-3.0 g/L)	1.41		
Lactate (08-2.2 mmol/L)	1.0		
Toxoplasma IgG & IgM	Negative		
Rubella IgM	Negative		

Figure: Light microscopy of the liver

- Hepatocytes showing cytoplasmic pallor and distention.
- On PAS stain, there is glycogen accumulation within hepatocytes.
- No bile duct inflammatory lesions seen.



CONCLUSIONS

- Persistent hyperglycaemia in premature infants should lead one to suspect neonatal diabetes (2).
- Delivery of insulin is challenging in premature infants with wasting.
- The occurrence of glycogenopathy in neonates is unusual and was probably related to wide fluctuations in the serum glucose and deposition of glycogen mediated by insulin
- Improved regulation of blood glucose with technical advances such as continuous subcutaneous insulin infusion may prevent the occurrence of glycogen hepatopathy.
- Deranged liver functions is unusual except in rare genetic syndromes (which were not evident).
- A combination of hepatocellular damage and oxidative stress (in utero) were possible explanations for the increased GGT noted at birth (3).
- Raised GGT levels have been reported with insulin resistance (4,5) but not in neonatal diabetes.
- Multiple pathophysiological mechanisms probably accounted for raised GGT levels.

DISCLOSURE STATEMENT: No conflict of interest to declare

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Diabetes
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