Conjugated Hyperbilirubinaemia

Introduction

This condition results from the failure of clearance from the body of the bilirubin which has been already combined with glucuronic acid to form the soluble glucuronide. This generally implies an obstruction of large or small branches of the biliary tree. The problem is not so much the conjugated bilirubin, which is non-toxic, but the pathological underlying cause.

Incidence and risk factors

Definition: Direct SBR > 30 umol/l, RPAH lab (usually >20% of total SBR).

Biliary atresia is the commonest (1:10,000) treatable cause of neonatal cholestasis and the prognosis is best if diagnosed early.

Differential Diagnosis

1. Extrahepatic Biliary Disease
   - Extrahepatic biliary atresia
   - Choledochal cyst
   - Bile-duct stenosis/perforation
2. Intrahepatic Biliary Disease
   - Intrahepatic bile-duct paucity
     - Syndromic form - Alagille Syndrome
     - Non-syndromic forms
   - Inspissated bile
3. Hepatocellular Disease
   - Metabolic and Genetic Disorders
     - Alpha-1 Antitrypsin Deficiency
     - Cystic fibrosis
     - Hypothyroidism
     - Galactosaemia
     - Zellweger Syndrome
     - "Storage diseases"
     - Dubin-Johnson, Rotor Syndromes
4. Infectious
   - Viral- TORCHES (esp CMV), rarely Hep B, Hep C, Varicella, ECHO
   - Bacterial- Sepsis, UTI
5. Iatrogenic
   - extended TPN
   - Drug or toxin
6. Idiopathic - neonatal hepatitis
7. Miscellaneous - shock or hypoxia (liver infarction)

Consequences

Elevated conjugated bilirubin is only a sign of the underlying condition, and being non-toxic, does not cause problems. It is the underlying condition that determines the infant's prognosis.

Investigations

A. Metabolic
• Ast, Alt, Ggt, Alp, coag profile
• Alpha-1 antitrypsin level (with PI typing if total low)
• T3, T4 and TSH
• Check Newborn Screening result (?CF, ?galactosaemia, ?hypothyroidism)
• Non-glucose reducing substances (?galactosaemia)
• Urine metabolic screen (?inborn error)
• Urine for pipacolic acid (?Zellweger's syndrome)

B. Infective
• Serology - CMV, Herpes, Rubella, Toxoplasmosis, Syphilis, Hep B, Hep C, Echovirus
• Urine for CMV - rapid test & culture (?CMV hepatitis)
• Microurine (?UTI)
• Blood culture (?septicaemia)

C. Obstructive
• Ultrasound scan liver and biliary system
• Nuclear scan ("disida scan")
• Stool for pigment (?biliary obstruction)

Treatment

It is not normally necessary to treat the jaundice as the conjugated form is not toxic, but also because phototherapy given to such babies causes the "bronze baby" syndrome.

Treatment should focus on the underlying condition, once it is identified.

Summary

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<th>Key Points</th>
<th>Level of evidence</th>
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<tr>
<td>Elevated conjugated bilirubin implies underlying pathology</td>
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<td>Phototherapy is contraindicated</td>
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