59) A 24 year old man develops acute tonsillitis with high fever (39.8 degrees). He is treated with erythromycin. The next day he is noticed to be icteric. Abdominal examination is unremarkable.

The following blood tests are obtained:

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>White cell count</td>
<td>18.5 x 10⁹/ L</td>
<td>4.0 - 11.0</td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>145 g/L</td>
<td>120 - 160</td>
</tr>
<tr>
<td>Platelet count</td>
<td>395 x 10⁹/ L</td>
<td>150 - 400</td>
</tr>
<tr>
<td>Sodium</td>
<td>140 mmol/L</td>
<td>135 - 150</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.5 mmol/L</td>
<td>3.5 - 5.0</td>
</tr>
<tr>
<td>Urea</td>
<td>8.5 mmol/L</td>
<td>3.6 - 9.3</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.09 mmol/L</td>
<td>0.06 - 0.12</td>
</tr>
<tr>
<td>Bilirubin</td>
<td>78 microm/L</td>
<td>3 - 23</td>
</tr>
<tr>
<td>ALP</td>
<td>46 u/L</td>
<td>30 - 115</td>
</tr>
<tr>
<td>GGT</td>
<td>55 u/L</td>
<td>&lt; 66</td>
</tr>
<tr>
<td>AST</td>
<td>35 u/L</td>
<td>5 - 40</td>
</tr>
<tr>
<td>ALT</td>
<td>32 u/L</td>
<td>5 - 40</td>
</tr>
<tr>
<td>Albumin</td>
<td>40 g/L</td>
<td>40 - 52</td>
</tr>
</tbody>
</table>

The most likely explanation for his jaundice is:

A. Haemolysis
B. Epstein Barr virus
C. Gilbert’s syndrome
D. Wilson’s disease
E. Erythromycin

Answer:

Metabolism of bilirubin:
1) Hepatic uptake from circulation (haem)
2) Intrahepatic storage
3) Conjugation with glucoronic acid
4) Excretion into faeces/ urine or recycled
Hyperbilirubinaemia results from:
1) Overproduction of bilirubin
2) Impaired uptake, conjugation or excretion of bilirubin
3) Regurgitation of unconjugated or conjugated bilirubin from damaged hepatocytes or bile ducts

Stepwise approach to diagnosis:
1) Conjugated versus unconjugated
   - ↑ conjugated bilirubin: rare inherited disorders (benign asymptomatic jaundice in 20s) with altered secretion of conjugated bilirubin into bile ducts +/- hepatic storage problems
     o Dubin Johnson syndrome
     o Rotor’s syndrome
   - ↑ unconjugated bilirubin
     o Drugs (rifampicin, probenecid)
     o Inherited disorders
       ▪ Gilbert’s syndrome
       ▪ Crigler Najjar’s syndrome
     o Haemolysis
       ▪ Extrinsic versus intrinsic

2) ? Other LFTs normal
   - Hepatocellular pattern
     o ALT/ AST ↑ out of proportion to ALP
   - Obstructive/ cholestatic pattern
     o ALP ↑ out of proportion to ALT/AST
   - Mixed