Short reports

Transcutaneous bilirubinometry: an evaluation

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SUMMARY The transcutaneous bilirubinometer was evaluated in 60 term and 10 preterm infants. A significant correlation was found between the transcutaneous index and the total serum bilirubin concentration for both term and preterm infants. The reliability of the transcutaneous bilirubinometer as a screening method was confirmed, and index criteria for serum bilirubin analysis have been suggested for term babies. The instrument was precise and accurate and the method both non-invasive and atraumatic. Since individual serum bilirubin levels and the transcutaneous index may correlate poorly, the transcutaneous method cannot replace traditional serum bilirubin estimation.

The transcutaneous bilirubinometer has been developed to permit the non-invasive, non-traumatic monitoring of neonatal jaundice. The principles of its operation were previously described in detail by Yamanouchi et al. This study set out to evaluate the precision, accuracy, and cost effectiveness of the instrument in the context of a busy perinatal service and in addition studied its correlation with total serum bilirubin values.

Patients and methods

During the study period all babies were assessed by the same experienced examiner (M S-P). A venous blood sample was taken for serum bilirubin analysis and a transcutaneous bilirubin index was simultaneously obtained from the glabellar area, this being the recommended site. The serum bilirubin was analysed by a modification of the chemical method of Jendrassik Grof. All the term infants in the study were white and weighed more than 2.7 kg. The measurements were obtained on day 1 to day 8. Three term infants suffered from ABO incompatibility.
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O Phototherapy
• No treatment

Fig. 2. Eighteen measurements in preterm infants.

Results

The reproducibility of the transcutaneous bilirubin values was assessed in 4 patients. Three or 4 sequential measurements were made in the glabellar area and the coefficient of variation was less than 5%, a figure consistent with precise clinical performance.

The 81 measurements on term infants are shown in Fig. 1. Separate analysis of 57 measurements in term babies on no treatment compared with 24 measurements in term babies on phototherapy gave r values of 0.65 and 0.76 respectively. The 18 measurements on preterm infants are plotted in Fig. 2.

Since an individual transcutaneous bilirubin index did not predict the serum bilirubin concentration (Figs 1 and 2) within the narrow range desired by the clinician we evaluated the instrument as a screening method.

The serum bilirubin results obtained in 57 term babies on no treatment were divided into three groups (Table). Using an index of 20 or greater as a criterion for taking a serum bilirubin level the clinician would detect all term babies with a serum bilirubin level greater than 250 μmol/l and would have no falsely negative screens. However, there would be a 75% false positivity on screening.

An evaluation of clinical screening compared with transcutaneous index as a screen is shown (Table). None of the 36 clinically mild cases was accompanied by a bilirubin level greater than 250 μmol/l. The clinically severe case was associated with a serum bilirubin level greater than 250 μmol/l. Three babies with a clinically moderate jaundice had serum bilirubin levels greater than 250 μmol/l.

Thus comparing clinical with transcutaneous index in screening effectiveness the transcutaneous

<table>
<thead>
<tr>
<th>TcB Index</th>
<th>Serum bilirubin (μmol/l)</th>
<th>Jaundice</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>&lt;190</td>
<td>190–250</td>
</tr>
<tr>
<td>&lt;15</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>15–19</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>≥20</td>
<td>1</td>
<td>12</td>
</tr>
</tbody>
</table>

Conversion: SI to traditional units—bilirubin 1 μmol/l = 0.058 mg/100ml.
Uncombable hair: a condition with autosomal dominant inheritance

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SUMMARY Uncombable hair is a familial abnormality of scalp hair structure which affects children and lessens as they grow older. It is suggested that the mode of inheritance of the condition is autosomal dominant.

In 1973 Stroud and Mehregan\(^1\) reported a patient with unusual hair which they termed 'spun glass hair'. In the same year Duprè \(et\ al.\)\(^2\) described a similar hair abnormality which they called the 'uncombable hair syndrome' or 'pili trianguli et canaliculi' according to the ultrastructural finding.