Haemoglobin Point-of-Care Testing

Martina Scicluna, Francesca Wirth, Lilian M. Azzopardi
Department of Pharmacy, Faculty of Medicine and Surgery, University of Malta, Msida, Malta
email: martina.s.scicluna.14@um.edu.mt

INTRODUCTION
This study seeks to evaluate the efficacy of point-of-care testing (POCT) in the monitoring of haemoglobin (Hb) in patients suffering from chronic diseases such as diabetes and chronic kidney disease (CKD), using two devices namely Stat-Site M Hgb and Diaspect Tm.

AIMS
• To determine and compare performance characteristics of the two Hb POCT devices against standard laboratory testing
• To evaluate patients’ and pharmacists’ perception on introducing this service in a community pharmacy

METHOD

Part 1
• 72 subjects recruited and tested using both devices.
• Subjects were suffering from CKD (n=24), diabetes (n=24) or were otherwise healthy (control) (n=24).

Part 2
• 20 subjects from each patient group (n=60) were recruited and tested once using Diaspect Tm only.
• Patient perception (n=60) and pharmacist perception (n=25) were measured through a questionnaire.

RESULTS
Specificity was higher for Diaspect Tm (51%) than for Stat-Site (16%). Improvement in all performance characteristics of Diaspect Tm in part 2: sensitivity of 100%, specificity of 75%, Positive predictive value (PPV) 38%, Negative predictive value (NPV) of 100% and accuracy of 78%

<table>
<thead>
<tr>
<th>Part</th>
<th>Result</th>
<th>Mean Diaspect result in g/dl</th>
<th>Mean standard result in g/dl</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 1</td>
<td>Healthy (n=24)</td>
<td>13.5</td>
<td>14.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Diabetic (n=24)</td>
<td>12.2</td>
<td>13.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>CKD (n=24)</td>
<td>12.0</td>
<td>12.9</td>
<td>0.007</td>
</tr>
<tr>
<td>Part 2</td>
<td>Healthy (n=20)</td>
<td>13.7</td>
<td>15.3</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Diabetic (n=20)</td>
<td>12.9</td>
<td>13.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>CKD (n=20)</td>
<td>11.8</td>
<td>12.5</td>
<td>0.117</td>
</tr>
</tbody>
</table>

Table 1: Comparison of mean Diaspect Hb value with mean lab standard value

CONCLUSION
The better performance characteristics, the rapidity and the ease of use of Diaspect Tm render it a better Hb POCT device compared to STAT-Site MHgb. Results were in accordance with the standard at Hb concentrations ranging from 10.4 to 13.9 g/dl in CKD patients (p=0.117). Statistically significant differences were observed at higher Hb concentrations with mean differences ranging from 0.91 to 1.57g/dl. POCT for haemoglobin may be offered from community pharmacies as a screening method to support patient monitoring. Diaspect Tm was shown to be especially useful in patients who are known to be anaemic.

Funding: University of Malta Research Grant on Point-of-Care Testing