Verification of Sysmex UF-5000
Helen Irwin and Fiona Shufflebottom • Royal Oldham Hospital

Introduction

UF-5000 is an in vitro fully automated urine particle analyser for the determination of clinical parameters in human urine and bodily fluids. It is based on the fluorescence flow cytometry method used to recognise and classify urine particles, it states to differentiate an increased number of particles through the development of new technology. Compared to the previous cytometers of the UF-Series, technological innovations aimed to improve the sensitivity and the specificity for some elements of urinary sediment, particularly for the determination of bacteria.

Comparison Study

1400 urine samples were run concurrently on the existing UF-1000i and the UF-5000 and the results were compared using Pearson Correlation. A very good correlation for WBC and RBC, with r = >0.98 was obtained.

Carry-Over Study

6 spiked samples containing heavy concentrations of bacteria associated with carry over issues and/or containing a thick mucoid capsule i.e. Klebsiella pneumoniae were prepared with dilutions down to 1:1000. Each sample was analysed on the UF-5000 (carry over function disabled), followed by 3 negative fluids, cultured, and results interpreted according to laboratory SOP’s. Carry over was observed on 3 occasions, however, the cultures were interpreted as moderate growth and these results would be assessed clinically.

Uncertainty of Measurement (UoM)

Streck UA Cellular complete external 3rd party control was analysed through the UF-5000 30 times. The results for WBC, RBC and bacteria were then analysed in Excel and the following results were obtained:

Table 1. Results of UoM Calculation

<table>
<thead>
<tr>
<th></th>
<th>WBC</th>
<th>RBC</th>
<th>Bacteria</th>
</tr>
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<tbody>
<tr>
<td>Mean</td>
<td>203.92</td>
<td>389.02</td>
<td>636.41</td>
</tr>
<tr>
<td>Std Dev</td>
<td>10.13</td>
<td>15.53</td>
<td>48.43</td>
</tr>
<tr>
<td>CV% (%RSD)</td>
<td>4.97</td>
<td>3.99</td>
<td>7.61</td>
</tr>
<tr>
<td>95% conf limit</td>
<td>9.94</td>
<td>7.99</td>
<td>15.22</td>
</tr>
</tbody>
</table>

WBC Cut-Off

In the UK Standards for Microbiology Investigations (SMI) significant WBC is given at 100 WBC/μL. Using this information and the MedCalc statistical package, ROC analysis (Fig.4) was performed and the Youden index calculated to accurately determine a WBC cut off for samples that would require culture.

Overall, with the results that were obtained the UF-5000 was comparable to the UF-1000i. The analyser was reported to be more user friendly and significantly reduced the requirement for manual microscopy.

Conclusion

References


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