Letters to the Editor

Polystyrene ESR tubes

The International Committee for Standardization in Hematology (1973) specifies the use of glass Westergren-Katz tubes. More recently, several manufacturers have introduced plastic (polystyrene) ESR tubes with similar physical dimensions.

A small series of ESR determinations has been performed to compare the values obtained in plastic (Guest Medical & Dental Products AG) with those obtained in glass (to BS 2554) tubes. For replicate determinations, blood (4 volumes) was taken into tri-sodium citrate 3:088 % solution (1 volume). For comparative studies, EDTA blood samples, up to 24 hours old, were diluted 4:1 with the citrate solution (Melville and Rifkind, 1959). The glass tubes were filled by negative pressure provided and maintained by a 2-ml plastic syringe connected to each tube by a small length of plastic tubing. The Guest ESR system utilised porous-plugged pipettes with a small suction apparatus for filling. The tubes were placed vertical and left undisturbed for one hour free from draughts and vibrations. Ambient temperatures were 21-23°C and the tubes were not exposed to direct sunlight. Readings were taken to the nearest millimetre.

The results obtained for replicate determinations are shown (Table).

The two series of replicates on the same blood sample, (b) and (c), were compared by the variance ratio test and Student's t test. Variance ratio = 1:492 (p > 0.05), t (df22) = 1.06 (p > 0.05). Neither the variances nor the means of the two series were significantly different. The values for the series in glass (c) are not dissimilar to previously reported findings, for example, those of Hutchinson and Eastham (1977).

In the comparative study, 82 samples were examined, 44 of which gave ESR values of 20 mm or greater fall in one hour by one or both methods. The two sets of results have been plotted in the Figure. The straight line of best fit has been drawn and the parameters of regression shown to be: slope 0.97 and intercept -0.24. The correlation coefficient, r, was 0.9939. This is very highly significant (p < 0.001).

The practical advantage of the polystyrene tube is that it is disposable, which obviates the need to clean potentially contaminated glassware with its associated health hazard.

<table>
<thead>
<tr>
<th>Series</th>
<th>Plastic</th>
<th>Glass</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>(b)</td>
<td>63</td>
<td>27</td>
</tr>
<tr>
<td>(c)</td>
<td>61-68</td>
<td>24-30</td>
</tr>
<tr>
<td>Observed range</td>
<td>4:1</td>
<td>25-30</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>1.89</td>
<td>1.27</td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>3.0</td>
<td>6.5</td>
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</tbody>
</table>

Comparison of ESR determinations performed in parallel in glass and plastic ESR tubes.

As a result of these studies we can recommend polystyrene ESR tubes for routine use.

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References

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