Comparison of VACUETTE® GLUCOMEDICS Blood Collection Tubes with S-Monovette® GlucoEXACT

**Background:**
Greiner-Bio-One, Austria has been selling plastic evacuated tubes (VACUETTE®) for venous blood collection since 1986.

VACUETTE® GLUCOMEDICS blood collection tubes contain an additive mix of Na₂EDTA, sodium fluoride, citric acid and sodium citrate. This mixture inhibits glycolysis and prevents coagulation.¹,²

The VACUETTE® GLUCOMEDICS blood collection tubes are used to stabilize the in-vivo glucose level in whole blood or plasma for up to 24 hours at room temperature and enable delayed sample processing time including both storage and/or transportation.³

The VACUETTE® GLUCOMEDICS blood collection tube has been designed in order to meet the requirements for diagnosing gestational diabetes provided by the German Association of Clinical Chemistry and Laboratory medicine.

**Study Objective:**
The study has been carried out to compare VACUETTE® GLUCOMEDICS with S-Monovette® GlucoEXACT blood collection tubes.

**Study design and procedure:**
Venous whole blood was collected from 83 pregnant patients into the following tubes:

**Sample 1: VACUETTE® GLUCOMEDICS**
**Sample 2: S-Monovette® GlucoEXACT**

The tubes were centrifuged at 2000g for 10 min at 20-24°C. In order to test the robustness of whole blood, one more tube of sample 1 was taken and centrifuged 24 hours after blood collection according to table 1.

The sample tubes which were centrifuged initially after blood collection were analyzed for glucose at the initial time point within 2 hours after blood collection and 24h after blood collection on the Siemens Dimension Vista analyzer. The sample tubes which were stored until 24h after blood collection at room temperature were then centrifuged and analyzed (see table 1).

**Table 1: Time of centrifugation and determination of glucose concentration**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Centrifugation</th>
<th>Determination of glucose concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Immediately after blood collection</td>
<td>24 hours after blood collection</td>
</tr>
<tr>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Between measurements, all samples were stored in an upright position at room temperature.

**Results:**
The results of glucose concentration have to be multiplied by a factor of 1.16 to compensate for dilution with the additive.
The mean values and further statistics of the glucose concentration are shown in Table 2.
Comparison analysis was performed at all time points of determination. Statistics was performed with the t-test (α = 0.05) using StatSoft Software, Version 9. Statistical significant (p<0.05) differences between VACUETTE® GLUCOMEDICS and S-Monovette® GlucoEXACT could be found for initial measurement and after 24h.
### Table 2: Results of glucose concentration [mg/dl]

<table>
<thead>
<tr>
<th>Sample</th>
<th>Valid N</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Std.Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VACUETTE® GLUCOMEDICS initial</td>
<td>83</td>
<td>120,9</td>
<td>66,1</td>
<td>203,0</td>
<td>36,0</td>
</tr>
<tr>
<td>S-Monovette® GlucoEXACT initial</td>
<td>83</td>
<td>113,5</td>
<td>55,6</td>
<td>216,9</td>
<td>33,8</td>
</tr>
<tr>
<td><strong>VACUETTE® GLUCOMEDICS after 24h</strong></td>
<td>83</td>
<td>118,8</td>
<td>59,1</td>
<td>204,2</td>
<td>35,6</td>
</tr>
<tr>
<td>S-Monovette® GlucoEXACT after 24h</td>
<td>83</td>
<td>113,7</td>
<td>60,3</td>
<td>213,4</td>
<td>33,9</td>
</tr>
</tbody>
</table>

(centrifugation initially after blood collection)

### Figure 1: Initial and 24h Glucose concentrations [mg/dl]
Centrifugation initially after blood collection

![Figure 1: Initial and 24h Glucose concentrations [mg/dl]](image1)

### Figure 2: 24h Glucose concentration [mg/dl]
VACUETTE® GLUCOMEDICS Centrifugation initially and 24h after blood collection

![Figure 2: 24h Glucose concentration [mg/dl]](image2)
**Conclusion:**
Clinical deviations between VACUETTE® GLUCOMEDICS and S-Monovette® GlucoEXACT are not to be considered clinically significant [4]. Therefore suitability of the VACUETTE® GLUCOMEDICS for gestational diabetes has been proven.

**References:**


