A pilot study to investigate interference by the dye brilliant blue G (BBG) on plasma biochemical values in dogs

Bente Flatland, Jill Narak
College of Veterinary Medicine, University of Tennessee, Knoxville, TN 37996

Introduction
Following acute spinal cord injury, adenosine triphosphate (ATP) is released into the extracellular space, resulting in activation of a purinergic receptor, P2X7, found in the spinal cord. Activation of P2X7 initiates a cascade of secondary events leading to irreversible cell death. A P2X7 selective antagonist, brilliant blue G (BBG), has potential to mitigate acute spinal cord injury. IV BBG was proven safe and neurologic outcome in a rat model. No clinically significant direct effect on biochemical values was observed in that study, similar to our results. Inability to identify properly the presence of interferents has potential to adversely affect patient results. Further study using various quality plasma samples is indicated.

Materials and methods
To examine the effect of BBG on analyte measurement and calculation of lipemia, hemolysis, and icterus indices, three levels of quality control material (QCM), chosen to mimic low, normal, and high analyte concentrations, were adulterated with BBG 0.08 µg/mL. A canine biochemical profile was measured in duplicate on both adulterated and non-adulterated samples using a Roche Cobas c 501; ANOVA was used to test for differences.

Results
Statistically significant differences between non-adulterated and BBG-adulterated samples were observed for BUN, cholesterol, chloride, TCO2, and triglyceride for all QCM; however, impact on analyte concentration was small and considered clinically unimportant.

Discussion & Conclusions
This pilot study involving a small number of data points suggests BBG interferes with calculation of lipemia, icterus, and hemolysis indices on the Cobas c 501. Interference is likely due to overlap of the BBG absorbance curve (peak absorbance 610 nm) with wavelengths used to calculate these indices (Table 1). Similar interference caused by Patent Blue V has been reported for the Roche Modular instrument. No clinically significant direct effect on biochemical values was observed in that study, similar to our results. Inability to identify properly the presence of interferents has potential to adversely affect patient results. Further study using various quality plasma samples is indicated.

Table 1. Wavelengths used by the Cobas c 501 to calculate plasma indices.

<table>
<thead>
<tr>
<th></th>
<th>Lipemia</th>
<th>Hemolysis</th>
<th>Icterus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>660</td>
<td>570</td>
<td>480</td>
</tr>
<tr>
<td>Secondary</td>
<td>700</td>
<td>600</td>
<td>505</td>
</tr>
</tbody>
</table>

Acknowledgments
We thank Ann Reed of the UT Office of Information Technology for help with the statistical analysis and Greg Hirshoren and Phil Snow of UT-CVM Instructional Resources for taking photographs.

Literature Cited