A Case of Green Plasma in the Blood Bank

A 43 year old female with Stage 2 breast cancer presented to the outpatient surgery clinic for a sentinel lymph node biopsy. During the procedure, the patient experienced a decrease in oxygen saturation levels and developed a rash and hives. She was not receiving any blood products. The patient was stabilized and admitted to the inpatient unit for observation. Upon arrival, her hemoglobin was noted to be 10.8 g/dL. A type and screen was ordered and sent to the laboratory.

Expected Results

<table>
<thead>
<tr>
<th>Sample</th>
<th>ABO</th>
<th>Rh(D)</th>
<th>Antibody Screen</th>
<th>Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDU-03</td>
<td>AB</td>
<td>POS</td>
<td>NEG</td>
<td>Red Cells with Green Plasma</td>
</tr>
</tbody>
</table>

Discussion

The striking green color of this patient’s plasma was caused by isosulfan blue (IB) dye released into the blood stream during the patient’s lymph node biopsy. Isosulfan blue, otherwise known as patent blue or Lymphazurin 1%, is absorbed by lymphoid tissue after subcutaneous injection and is used to clearly identify margins of lymph node tissue in order to enable biopsy or lymphadenectomy.\textsuperscript{1, 2}

Isosulfan blue has been noted to induce mild to severe anaphylactic allergic reactions and hypersensitivity to the dye may not be known prior to surgery. IB belongs to a group of triphenylmethane-based dyes which are similar to commonly used dyes in household items.\textsuperscript{3} Prior sensitization via lifelong exposure to products such as detergents or cosmetics containing isosulfan blue-like substances explains these IgE-mediated allergic reactions, which have a reported incidence of 0.1\%-2\%.\textsuperscript{3} In addition to allergic reactions, IB may cause a temporary blue hue to develop in the skin and blue/green discoloration of urine for 24 to 48 hours after injection.\textsuperscript{1, 3} Isosulfan blue is also known to alter the light absorbency of blood and therefore may interfere with light-based pulse oximetry readings.\textsuperscript{2} The effect of this is a falsely low oxygen saturation (SpO\textsubscript{2}) level as was exhibited by this patient.

Specimens contaminated with isosulfan blue are rarely received in the blood bank as most samples for transfusion are collected prior to surgery.\textsuperscript{1} This artifact may persist for 24 to 48 hours until it has cleared the body, so it is important to be aware of this phenomenon in order to avoid rejected samples and delays in transfusion.\textsuperscript{3} While isosulfan blue has no known pharmacologic properties and would not be expected to interfere with blood bank testing, there is no definitive data available on laboratory assay interference and results should be interpreted with caution.\textsuperscript{1, 2, 4}
A Case of Green Plasma in the Blood Bank (cont.)

References


Additional Reading


This case study and discussion was provided by Hemo bioscience (www.hemobioscience.com), the manufacturer of these Blood Bank proficiency samples.