

Looking at Plasma Hemoglobin with a Jaundiced Eye

Hemoglobin, bilirubin and triglycerides (due to chylomicrons) are the three major interferences of concern to laboratorians measuring analytes in plasma or serum. Most modern analyzers measure absorbance at appropriate wavelengths to determine the presence (and approximate level) of these compounds. Determination of plasma hemoglobin may be affected by elevated bilirubin levels using direct spectrophotometry because of overlapping absorption bands (1). However, the degree of interference with methods using chromogenic indicators or methemoglobin derivatives has not been well characterized.

Both PHG-01 and PHG-02 specimens in the PHG-A 2010 challenge had similar levels of free hemoglobin. However, the level of bilirubin in PHG-01 was 4.9 mg/dL (as opposed to 0.7 mg/dL in PHG-02). Based on participant results, all approaches to plasma hemoglobin were affected by the presence of an elevated bilirubin level. The greatest increase was seen using direct spectrophotometry, but similar increases were apparent with other methods.

The clinical significance of this interference is unclear. Plasma hemoglobin measurements are primarily used to calculate blood loss during surgery or efficiency of intraoperative blood salvage. Rarely, they may also be used to confirm a low level of hemolysis in plasma when assay interference is suspected. Although it is unlikely that bilirubin interference would seriously compromise any of these applications, laboratorians should be aware of this interference as a potential problem.

1. Wong SS, Schenkel OJ. Quantification of plasma hemoglobin in the presence of bilirubin with bilirubin oxidase. *Ann Clin Lab* 1995;25:247-251.

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