A Comparison of Three Methods of Hemoglobin Monitoring in Patients Undergoing Spine Surgery. Miller R.D., Ward T.A., Shiboski S.C., Cohen N.H. *Anesth Analg* 2011;112:858–63.

Background

Hemoglobin values (Hb) can facilitate decisions regarding perioperative transfusion management. Currently, Hb can be determined invasively by analyzing blood via laboratory Co–Oximetry (tHb) or by point-of-care HemoCue (HCue). Recently, a new noninvasive, continuous spectrophotometric sensor (Masimo SpHb) was introduced into clinical practice. We compared the accuracy of the SpHb and HCue with tHb.

Methods

Twenty patients, ages 40 to 80 years, were studied. They received general anesthesia and underwent spine surgery in the prone position. All blood samples were obtained from a radial artery catheter. SpHb, tHb, and HCue were determined immediately after induction of anesthesia, but before the start of surgery and approximately every hour thereafter. Primary outcomes were defined on the basis of the following differences between measures: SpHb -- tH or HCue -- tHb. All patients had 3 to 5 observations taken on each measure. Differences and absolute differences were analyzed by several techniques to assess accuracy. We also investigated the relationship between observed differences and the following variables: tHb level, duration of surgery, age, weight, and perfusion index.

Results

Data consisted of 78 measurements of SpHb, tHb, and HCue made on the 20 patients. Absolute differences between SpHb and tHb were <1.5 g/dL for 61% of observations, between 1.6 to 2.0 g/dL for 16% and >2.0 g/dL for 22% of the observations. Observed differences displayed significant decreases with time and higher perfusion index values. No systematic relationships were observed with age or weight. Except for 1 value, all of the HCue values were <1.0 g/dL of tHb.

Conclusions

Although HCue was consistently accurate, our data confirm that SpHb often correlated well with tHb values. Yet our study indicates that SpHb may not be as accurate as clinically necessary in some patients. Improved refinement of continuous, noninvasive technology, such as SpHb, could address important clinical requirements.