Does Measuring Hematocrit during Surgery Predict Blood Loss?
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Summary: In a prospective study, we find ABG and CBC measurements may or may not correlate with operative blood losses. Change in hematocrit during surgical exposure does predict overall blood loss in AIS.

Background: Estimating blood loss during spinal deformity surgery for scoliosis is challenging. In the operating room clinicians often rely on arterial blood gas (ABG) and complete blood count (CBC) measurements of hematocrit to predict estimated blood loss (EBL) and inform transfusion decisions. The purpose of this study was to evaluate the accuracy of hematocrit measurements in estimations of EBL.

Methods: Data was prospectively collected from 30 patients with Adolescent Idiopathic Scoliosis (AIS). CBCs were collected two weeks prior to surgery, after intubation, and in recovery. ABGs were collected at incision, anchor placement, rod placement, and skin closure. Intra-operative data included fluid administration, volume of transfused blood, and EBL, estimated to be three times the cell saver volume which was given to patients during skin closure.

Results: Of the 30 patients with AIS, eight were omitted for having an autologous or allogenic blood transfusion, or incomplete laboratory data (13F, 9M, average BMI 23.4, mean age 14.8). Changes in hematocrit obtained before and after surgery as measured by CBC (R= -.034) did not correlate with blood loss. Hematocrit changes from incision to the start of skin closure as measured by ABG (R=0.412) had a weak correlation with EBL. However, the hematocrit change during surgical exposure had a significant positive correlation with overall blood loss (R=0.512, p< .05).

Conclusions: We report that CBC and ABG measurements during spinal fusion for AIS are generally not reliable predictors of EBL. However, the change in hematocrit during surgical exposure did predict EBL. Hematocrit evaluation during surgical exposure in combination with blood pressure, heart rate monitoring, ABG assessment of tissue perfusion (pH, PO2, PCO2), and cell saver volumes are the most valuable indicators of EBL.