

Evaluation of Non-Invasive Hemoglobin Monitoring in Trauma Patients with Low Hemoglobin Levels.

Gamal M(1), Abdelhamid B, Zakaria D, Dayem OAE, Rady A, Fawzy M, Hasanin A. Shock. 2017 Jul 19. doi: 10.1097/SHK.0000000000000949. [Epub ahead of print]

OBJECTIVE: Bleeding is a leading cause of death among trauma patients. Delayed assessment of blood hemoglobin level might result in either unnecessary blood transfusion in non-indicated patients or delayed blood transfusion in critically bleeding patients. In this study, we evaluate the precision of non-invasive hemoglobin monitoring in trauma patients with low hemoglobin levels.

METHODS: We included trauma patients with low hemoglobin levels (less than 8 g/dL) scheduled for surgical intervention. Blood samples were obtained on admission and after each blood unit with concomitant measurement of serum hemoglobin using radical-7 Masimo device. The change in blood hemoglobin after every transfused blood unit was also assessed by both methods (Delta-Sp-Hb and Delta-Lab-Hb). The precision of Masimo hemoglobin level (Sp-Hb) compared to Laboratory hemoglobin level (Lab-Hb) was determined using both Bland-Altman and Pearson correlation analyses.

RESULTS: One hundred and eighty-four time matched samples were available for final analysis. Bland-altman analysis showed excellent accuracy of Sp-Hb compared to Lab-Hb with mean bias of 0.12 g/dL and limits of agreement between -0.56 g/dL to 0.79 g/dL. Excellent correlation was reported between both measures with Pearson correlation coefficient of 0.872. Excellent agreement was also reported between both Delta-Sp-Hb and Delta-Lab-Hb with mean bias of -0.05 and limits of agreement from -.62 to 0.51

CONCLUSIONS: Sp-Hb showed accurate precision in both absolute values and trend values compared to Lab-Hb measurement in trauma patients with low hemoglobin levels.