

Initial Evaluation of a New Continuous Noninvasive Haemoglobin Monitor (Pulse CO-Oximeter) in Surgical Patients. Pérez A, Bisbe E., Álvarez J., Tarragón S., Escolano F. *Eur J Anaesthesiol* 2009; 26 (Suppl 45): 3AP6-8E.

Background

Blood haemoglobin (Hb) concentration is a very common and essential test to assess patient well-being and the need for blood transfusion. In the perioperative period this measurement is further more critical mainly due to the acute nature of blood loss and the need for an immediate response. The pulse CO-Oximeter is a noninvasive monitor, for detecting changes in Hb in real time. It uses a sensor in the patient's finger that shows the Hb concentration in a continuous and noninvasive way. Furthermore it gives the SpO₂, heart rate, carboxiHb, methaHb, Pleth Variability Index and the Perfusion Index (PI). The aim of the study is to compare the arterial Hb conventional measure with the pulse CO-Oximeter Hb values during the perioperative period.

Methods

We studied 15 measurements in 8 surgical patients comparing the noninvasive Hb determination of the pulse CO-Oximeter with the laboratory arterial hemoglobin determination in the anesthetic induction, during surgery and in the post-operative period. We also collected epidemiological, clinical and hemodinamical information during the determinations. For evaluating the accuracy we used the interclass correlation coefficient (ICC) and the Bland-Altman graph.

Results

The mean age was 68.6 ± 24.7, 6 females/2 males. 6 orthopedic surgery/2 abdominal surgery. The mean surgical time was 173 ± 93 min. The mean difference between the Hb provided by the pulse CO-Oximeter and the laboratory arterial measure was 0.145, 1.04 for intraoperative period and 1.15, 0.9 for global measures. The ICC respect the individual arterial Hb was 0.599(0.018-0.875), the average was 0.75(0.038-0.933) with a significance of p=0.024. The ICC between the monitor Hb and the arterial Hb is moderate but acceptable during the intraoperative period. Nevertheless is fundamental a PI upper 2 for a high quality measure of the Hb value and we had worse measures of PI in postoperative period. In surgical patient, due to hypothermia, vasoconstriction and bleeding, the use of a digital sensor conditions due IP measure under 2 and consequently not always the Hb measures are reliable. We think that better adapted sensors to the surgical environment should increase the reliability and precision of the monitor. New software less PI dependent should give more reliable results.

Conclusions

It should be necessary large size study for obtaining better conclusions, but the perspective of a noninvasive and continuous Hb monitoring method should be very useful.