

Clinical assessment of peripheral perfusion to predict postoperative complications after major abdominal surgery early: a prospective observational study in adults.

van Genderen ME, Paauwe J, de Jonge J, van der Valk RJ, Lima A, Bakker J, van Bommel. *Crit Care*. 2014 Jun 3;18(3):R114.

Introduction

Altered peripheral perfusion is strongly associated with poor outcome in critically ill patients. We wanted to determine whether repeated assessment of peripheral perfusion during the days following surgery could help to early identify patients that are more likely to develop postoperative complications.

Methods

Hemodynamic measurements and peripheral perfusion parameters were collected one day prior to surgery (BL), directly after surgery (D0), and on the first (D1), second (D2) and third (D3) postoperative days. Peripheral perfusion assessment consisted of capillary refill time (CRT), peripheral perfusion index (PPI; Masimo SET(R) pulse oximetry Perfusion Index, Radical 7, Basingstoke, Hants, UK), and forearm-to-fingertip skin temperature gradient (T_{skin-diff}). Generalized linear mixed-models were used to predict severe complications within 10 days of surgery (Clavien-Dindo classification).

Results

We prospectively followed 137 consecutive patients of whom 111 were included in the analysis. Severe complications were observed in 19 patients (17.0%). Postoperatively, peripheral perfusion parameters were significantly altered in patients who subsequently developed severe complications compared to those who did not, and these persisted over time. CRT was altered directly after surgery (D0) and PPI and T_{skin-diff} were altered subsequently on D1 and D2, respectively. Among the different peripheral perfusion parameters, the diagnostic accuracy of predicting severe postoperative complications was highest for CRT on the second postoperative day (area under the receiver operating characteristic curve: 0.91 ((95% confidence interval (CI) 0.83 to 0.92)) with a sensitivity of 0.79 (95% CI 0.54 to 0.94) and a specificity of 0.93 (95% CI 0.86 to 0.97). Generalized mixed-model analysis demonstrated that abnormal peripheral perfusion on the second and third postoperative day was an independent predictor of severe postoperative complications ((odds ratio 8.4, 95% CI 2.7 to 25.9) and (6.4, 2.1 to 19.6), respectively).

Conclusions

In a group of patients following major abdominal surgery, peripheral perfusion alterations are associated with the development of severe complications, independent of systemic hemodynamics. Further research is needed to confirm these findings and to explore in more detail the effects of peripheral perfusion targeted resuscitation following major abdominal surgery.