

Evaluation of perfusion index as a tool for pain assessment in critically ill patients.

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Pain is a common and undertreated problem in critically ill patients. Pain assessment in critically ill patients is challenging and relies on complex scoring systems. The aim of this work was to find out the possible role of the perfusion index (PI) measured by a pulse oximeter (Masimo Radical 7; Masimo Corp., Irvine, CA, USA) in pain assessment in critically ill patients. A prospective observational study was carried out on 87 sedated non-intubated patients in a surgical intensive care unit. In addition to routine monitoring, a Masimo pulse oximeter probe was used for PI measurement. The sedation level of the patients was assessed by using the Richmond Agitation-Sedation Scale (RASS). The pain intensity was determined by applying the behavioral pain scale for non-intubated (BPS-NI) patients. The PI, arterial blood pressure, heart rate, RASS, and BPS-NI values before and after the application of a standard painful stimulus (changing the patient position) were reported. Correlation between the PI and other variables was carried out at the two measurements. Correlation between changes in the PI (delta PI) and in the hemodynamic variables, RASS, and BPS-NI was also done. Changing the patient position resulted in a significant increase in SBP (128 ± 20 vs 120.4 ± 20.6 , $P = 0.009$), DBP (71.3 ± 11.2 vs 68.7 ± 11.3 , $P = 0.021$), heart rate (99.5 ± 19 vs 92.7 ± 18.2 , $P = 0.013$), and BPS-NI (7[6-8] vs 3[3-3], $P < 0.001$) values and a significant decrease in the PI ($1[0.5-1.9]$ vs $2.2[0.97-3.6]$, $P < 0.001$) value compared to the baseline readings. There was no correlation between the values of the PI and the ABP, BPS-NI, and RASS at the two measurements. A good correlation was found between the delta PI and delta BPS-NI ($r = -0.616$, $P < 0.001$). A weak correlation was observed between the PI and heart rate after the patient positioning ($r = -0.249$, $P < 0.02$). In surgical critically ill non-intubated patients, the application of a painful

stimulus was associated with decreased PI. There was a good correlation between the change in the PI and the change in BPS-NI values after the application of painful stimulus.