False Alarm Rates of Three Third-Generation Pulse Oximeters in PACU, ICU and IABP Patients.

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Introduction

The objective of this clinical study was to determine alarm rates--in particular the frequency of false positive alarms--of three third-generation pulse oximeters in the postanesthesia care unit (PACU), the intensive care unit (ICU), and in patients with an intra-aortic balloon pump (IABP): Nellcor Symphony N-3000, a Masimo IVY 2000, and Agilent Viridia CMS 2000.

Methods

All alarms were classified into technical/physiological and false/correct.

Results

235 consecutive ASA physical status I-IV patients after surgery were included into the study. In the PACU false positive alarms were rare: CMS n = 60, N-3000 n = 60, Masimo n = 87. Bland-Altman testing discovered only negligible differences of alarm rates and dropout times. Out of a total of 728 alarms 67.3% were classified as false positive in ICU-patients: 97 alarms by CMS, 176 by N-3000 and 218 by Masimo SET. If IABP was present, CMS indicated a significant smaller number of false positive alarms (n = 35, 7.2%) when compared to Masimo SET (n = 188, 38.9%) and N-3000 (n = 229, 47.4%), consecutively the majority of false positive alarms (76.2%) can be rated as a result of the interference of IABP.

Conclusion

Unless IABP (and to a considerably smaller extent cardiac arrhythmia) is present the pulse oximeters do not differ significantly regarding sensitivity and specificity