

Pulse Oximetry during Intraaortic Balloon Pump Application.

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Background

Pulse oximeters are multiple used devices in anaesthesiology and intensive care medicine and must provide reliable data during various conditions of signal interference, including light, motion and reduced perfusion. The aim of this study was to evaluate the reliability of different new-generation pulse oximeters during intraaortic balloon pump (IABP) therapy.

Methods

In the experimental setting, the validity of three pulse oximetry technologies (Masimo Radical-7, Nellcor N-600 and Datex Ohmeda TruSat) was evaluated in patients with IABP treatment. Arterial blood gas analysis (BGA-SaO₂) data were compared with the pulse oximetric values (SpO₂) during 1:1, 1:2 and 1:3 support ratio.

Results

The mean differences (bias) during 1:1, 1:2 and 1:3 IABP support between BGA-SaO₂ and Datex-SpO₂ were 3.38% [95% confidence intervals (CI):±1.39%], 1.41% (95% CI 1.14%) and 2.10% (95% CI:±0.94%), respectively. Between BGA-SaO₂ and Nellcor-SpO₂, a bias of 0.77% (95% CI:±0.46%), 0.85% (95% CI:±0.40%) and 0.59% (95% CI:±0.38%) was found. In the comparison of BGA-SaO₂ and Masimo-SpO₂, a bias of 0.58% (95% CI:±0.56%), 0.19% (95% CI:±0.40%) and -0.01% (95% CI:±0.43%) was found, respectively.

Conclusions

In patients with IABP support, the pulse oximetric values of the Masimo Radical-7 are accurate in 1:2 and 1:3 support ratio compared with blood gas analysis. In these support ratios, the Masimo Radical-7 is superior to the Nellcor N-600. The Datex Ohmeda TruSat showed a significant difference between the measured pulse oximetric values and blood gas analysis in all support ratios.