

Performance Evaluation of a New Pulse Oximeter during Mild Hypothermic Cardiopulmonary Bypass.

Irita K., Kai Y., Akiyoshi K., Tanaka Y., Takahashi S. *Anesth Analg.* 2003 Jan;96(1):11-4.

Introduction

Newly developed pulse oximeters (POs) are designed to display accurate SpO₂ during motion and hypoperfusion.

Methods

We compared the performance of a new PO, the Masimo SET Radical (M), with a conventional PO, the Nihon Kohden AY-900P (N), during hypothermic cardiopulmonary bypass. Eighteen patients were studied prospectively. PO failure was defined as failure to show no SpO₂ value or show incorrect SpO₂ values for longer than 3 min continuously.

Results

PO failure occurred in 4 and 14 patients with M and N, respectively ($P = 0.0022$). All 4 patients in whom PO failure developed with M were among the 14 patients with N. No SpO₂ was provided for 4% +/- 12% of the duration of aorta cross-clamping with M and 36% +/- 39% with N ($P = 0.002$). Skin temperature and mean arterial blood pressure when PO failure started to occur and ended were similar between M and N. PO failure easily developed in patients with preoperative diuretic therapy or with intraoperative hyperlactatemia in N, but not in M. M was able to display accurate SpO₂ values significantly more frequently and longer than N during mild hypothermic cardiopulmonary bypass with nonpulsatile flow, suggesting that M is more useful for monitoring SpO₂ during hypoperfusion.

Implications

We compared the performance of a new pulse oximeter with that of a conventional pulse oximeter during hypothermic cardiopulmonary bypass with nonpulsatile flow. The newly developed device displayed accurate SpO₂ significantly more frequently and longer than a conventional oximeter. Newly developed pulse oximeters seem to be more useful for monitoring SpO₂ during hypoperfusion.