The Usefulness of Perfusion Index to Access the Vasoconstrictive Response to Tracheal Intubation during Remifentanil Anesthesia.

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Introduction

The effect-site concentration of remifentanil blunting sympathetic responses to tracheal intubation is supposed to be above 5 ng/ml. We investigated the change of hemodynamics using Perfusion Index (Radical-7, Masimo Corp., Irvine, CA) to a vasoconstrictive stimulus for tracheal intubation in this situation.

Methods

We selected randomly ASA I-II patients undergoing elective abdominal surgery. We simulated fast and consistent administration modes of remifentanil reaching 6 ng/ml in the effect-site with Tivatrainer© program and performed the continuous infusion of 1 μg/kg/min for 2 min and consequently 0.5 μg/kg/min. All patients were monitored with Perfusion Index and Bispectral Index (BIS) using (BIS XP A2000TM, Aspect Medical Systems Inc., Natick, MA). They received a bolus injection of 1.5 mg/kg propanol with remifentanil. Then 0.9 mg/kg rocuronium was administered and tracheal intubation was conducted. We measured values of hemodynamics, Perfusion Index, and BIS at 1 min before and after tracheal intubation. The value, $P<0.05$ was considered to be statistically significant and data were expressed as mean±SD.

Results

Sixteen patients received this study. Tracheal intubation was completed at 5.2±1.1 min from infusion of remifentanil. BIS values maintained below 60 after induction of anesthesia without significant changes of BIS values due to tracheal intubation. Perfusion Index decreased significantly (4.2±1.8 vs. 2.5±1.2, $P<0.001$), heart rate and mean arterial pressure increased significantly after tracheal intubation.

Discussion

The effect-site concentration of remifentanil reached 6 ng/ml 2 min after infusion in this study. As the effect site concentration of remifentanil in 50% cases (Ce50) for blockade of sympathetic responses was regarded as 5 ng/ml, cardiovascular responses to tracheal intubation could not be attenuated sufficiently in this study. Perfusion Index might serve to detect a vasoconstrictive response to tracheal intubation and to obtain the appropriate depth of anesthesia than a measurement of hemodynamics.

1. Anesth Analg 2005;101:125-30
2. Anesth Analg 2009;108:549-53