

## Intraoperative “Remifentanil Challenge” as a predictor of postoperative morphine requirement and respiratory depression

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**Background:** Patient-controlled analgesia (PCA) of morphine has revealed high incidence of respiratory depression. We evaluated the intraoperative remifentanil challenge as a predictor for postoperative morphine requirement and respiratory adverse events.

**Material and Method:** Fifty patients who were candidates for percutaneous nephrolythotripsy were enrolled. They received intravenous anesthesia with propofol and remifentanil, meticulously adjusted to maintain blood pressure and cerebral status index in a pre-set range. Propofol was disconnected at the end of surgery while remifentanil was continued by half of previous infusion rate until the patient spontaneously breathed. Remifentanil challenge with an infusion rate of  $0.2 \mu\text{g}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$  was initiated to reach bradypnea (respiratory rate  $<10$ ). Effect-site concentrations for remifentanil ( $C_{\text{ere}}$ ) and propofol ( $C_{\text{epo}}$ ) were simulated and recorded at that time. Patients received morphine PCA in recovery and were continuously monitored for six hours. Morphine requirement and respiratory adverse events were recorded.

**Results:**  $C_{\text{ere}}$  and  $C_{\text{epo}}$  associated with challenged bradypnea were  $1.42 \pm 0.4 \text{ ng/ml}$  and  $0.48 \pm 0.08 \mu\text{g/ml}$ , respectively. Receiver operating characteristics curve showed an area under the curve of 0.97 for  $C_{\text{ere}}$  (at the challenge test) to diagnose postoperative bradypnea. Nine patients experienced bradypnea while two had desaturation ( $\text{SpO}_2 < 90\%$ ). There was a strong correlation between morphine requirement and  $C_{\text{ere}}$  (Pearson coefficient: 0.9;  $p < 0.0001$ ).

**Conclusion:**  $C_{\text{ere}}$  of the intraoperative remifentanil challenge has a strong correlation and diagnostic value with postoperative analgesic morphine requirement and its respiratory depression. Further studies are required to show the applicability of this test in selecting various postoperative analgesic protocols.

**Key words:** Remifentanil, patient controlled analgesia, respiratory depression, bradypnea, effect-site concentration.

### Biography

Alireza Jafari, working as an Assistant professor in Anesthesia Department of Shahid Beheshti University of Medical Sciences is a member of International Anesthesiology Research Society (IARS). He has delivered his lectures in renowned conferences organized in Italy, 2007 to IARS meeting, conducted in Boston 2012.

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