

## **Abstract**

Remifentanil is an ultra-short-acting opioid that sometimes causes opioid-induced hyperalgesia, which has led to controversy regarding the association between intraoperative remifentanil administration and postoperative pain. This study aimed to assess the effects of the intraoperative remifentanil dose on postoperative pain. Patients undergoing esophageal, gastric/hepatobiliary, or intestinal/colon surgery and using postoperative patient-controlled epidural analgesia were analyzed. The patients were divided into two groups based on the average intraoperative remifentanil dose (high-dose remifentanil [HR] group:  $\geq 0.1 \mu\text{g/kg/min}$ ; low-dose remifentanil [LR] group:  $< 0.1 \mu\text{g/kg/min}$ ). In all, 406 patients met the inclusion criteria. A significant difference in the average dose of remifentanil was seen between the groups during the anesthesia period ( $0.14 \pm 0.05$  vs.  $0.07 \pm 0.02 \mu\text{g/kg/min}$ ). However, no significant difference was seen in pre- or intraoperative patient characteristics. Numerical rating scale (NRS) scores on postoperative day 1 were similar between the groups (HR:  $1.7 \pm 2.0$ ; LR:  $1.7 \pm 2.0$ ;  $p=0.74$ ). The incidence of poor pain control (NRS  $> 3/10$ ) was also similar between the groups (HR: 14%; LR: 16%;  $p=0.57$ ). Older age ( $> 60$  years) and type of surgery (esophageal surgery) were associated with worse postoperative NRS scores.

No significant association was seen between the intraoperative remifentanil dose and postoperative NRS scores following thoracoabdominal surgery with postoperative epidural pain management.

**Key words:** high-dose remifentanyl, postoperative numerical rating scale, type of surgery, epidural block