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LETTER TO THE EDITOR

Correct interpretation of between-group statistical differences in analgesic efficacy of different intercostal nerve block modalities

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To the Editor:

In a retrospective, single-cohort study of 241 patients undergoing thoracoscopic pulmonary resection, Nakai et al. [1] showed that compared with single-shot multi-level intercostal nerve block (ML-ICB), divided MLICB with 50% total ropivacaine dose decreased the intraoperative remifentanil dose, postoperative pain score at 24 h and intravenous rescue drug use. As the opioid-sparing multimodal analgesia protocols including a nerve block is an important component of the current Enhanced Recovery After Surgery (ERAS) practices for thoracoscopic surgery [2], their findings have potential implications. In addition to the limitations described by the authors in the discussion section, however, we noted several issues in this study and would appreciate the responses from the authors.

First, 20 mL of 0.75% ropivacaine were used for single-shot ML-ICB. The use of high concentration ropivacaine for a peripheral nerve block lacks clinical evidence. The available literature indicates that ropivacaine concentration is not a main determinant of analgesic efficacy for peripheral nerve blocks [3] and minimum effective concentration (MEC_{90}) of ropivacaine for peripheral nerve blocks is 0.257% [4]. When nerve or fascial plane block is for the purpose of perioperative pain control, thus, 0.25–0.375% ropivacaine is often preferred in the clinical practice [3, 5], as 0.25% ropivacaine for divided ML-ICB in this study.

Second, other than the divided ML-ICB performed at the beginning and end of surgery, incisional local anesthetic infiltration before surgery was also performed with 4 mL of 0.25% ropivacaine in the divided MLICB group. However, this local anesthesia technique, which is recommended by current ERAS practices for thoracoscopic surgery [2], was not carried out in the single-shot MLICB group. It has been shown that incisional local anesthetic infiltration before surgery can significantly improve pain control at 4 and 24 h after thoracoscopic surgery [5]. We are concerned that this factor would have biased the pain outcomes in favor of the divided MLICB group.

Third, this study showed that proportion of patients with numerical rating scale pain scores of 0 to 3 at 24 h postoperatively was significantly increased in the divided MLICB group compared to the single-shot MLICB group. The authors did not provide the patients' status in assessing postoperative pain levels. For patients undergoing thoracoscopic pneumonectomy, robust evidence indicates that postoperative pain is more severe during movement or coughing than at resting [6, 7]. We argue that this unknown factor would have confused the results of postoperative pain assessment in this study.

Fourth, intraoperative remifentanil dosages were 14.4 ± 6.4 μg/kg/h in the divided MLICB group and 16.7 ± 8.4 μg/kg/h in the single-shot MLICB group, respectively, with a significantly statistical difference. As mean surgical time was 151–159 min in the two groups, we calculated that the net between-group different of total intraoperative remifentanil dosages was about 4–5 mg, only equivalent to one tenth of a 50-mg remifentanil ampoule. Thus, the clinical significance of such a small intraoperative opioid-sparing with the divided MLICB is questioned.

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Fifth, non-opioid basic analgesics including acetaminophen and nonsteroidal anti-inflammatory drugs are commonly considered the cornerstone of perioperative analgesia in the current ERAS pathways for thoracic surgery [8]. In this study, however, these drugs were only used for rescue analgesics in the ward according to the pain scores and patients' needs. This is evidently inconsistent with the requirements of the opioid-sparing multimodal analgesia protocols recommended by the current ERAS practices for thoracoscopic surgery [2, 8], which require that administration of non-opioid basic analgesics should be initiated before surgery or during surgery and regularly repeated after surgery. Opioid analgesics, such as tramadol and fentanyl, are used for moderate to severe pain that is not adequately controlled with non-opioid basic analgesics. We argue that different results comparing postoperative analgesic efficacy of the single-shot and divided MLICB would have been obtained, if a standard opioid-sparing multimodal analgesic strategy was included in this study design according to the current ERAS practices for thoracoscopic surgery [2].

Finally, in statistical analysis of data, the authors described that the Chi-square test and multivariable logistic regression analysis were used to calculate the correlations between categorical variables. However, the results of multivariable logistic regression analysis were not provided.

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Data availability Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Declarations

Conflict of interest None declared.

Ethical approval As this is a letter to the editor that comments the published paper in Journal of Anesthesia and is not involved in any human study, the IRB approval, consent statement and clinical trial registration are not applicable.

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