Letter to Editor

Determining Optimal Ropivacaine Concentration for Erector Spinae Plane Block in Patients for Thoracoscopic Lobectomy

To the Editor,

By conducting a prospective observational cohort study of 68 patients who underwent videoassisted thoracoscopic lobectomy, Chung and colleagues[1] showed that 0.375% ropivacaine was optimal for an ultrasoundguided erector spinae plane block (ESPB) in terms of controlling pain and decreasing intraoperative opioid consumption with minimal adverse outcomes. However, we noted several issues in this study that would have made the interpretation of main findings questionable.

First, the sample size was calculated based on the postoperative pain scores of a previous study, which assessed postoperative analgesic efficacy of transverse abdominis plane block with 0.25%, 0.5%, and 0.75% ropivacaine for inguinal hernioplasty. This seems inappropriate because there are significant differences between two studies in surgery types and ropivacaine concentrations. The authors provided the mean postoperative pain scores of a previous study but did not provide the standard deviations, which are the important components required for sample size calculation.[2] Most important, a specific value of effect size was also not provided. In these cases, we cannot determine whether the calculated sample size in this study has enough power to differentiate the clinically significant differences among three groups in postoperative pain outcomes.

Second, remifentanil was continuously infused at a rate of 0.5–0.8 mcg/kg/h for maintenance of general anesthesia after tracheal intubation and the mean operation times were 2.9–3.4 h. The authors reported that the total dosages of intraoperative remifentanil were 7.20 ± 3.04, 5.32 ± 2.70, and 4.60 ± 1.75 mcg/kg in the G1, G2, and G3 groups, respectively. It was unclear why the total dosages of intraoperative remifentanil were significantly larger than the calculated dosages based on infusion rate and operation times.

Third, the authors did not provide the reasons and evidence for selecting three concentrations (0.189%, 0.375%, and 0.556%) of ropivacaine. Available evidence indicates that the 90% minimum effective concentrations (MEC_{90}) of ropivacaine were 0.257% for nerve blocks[3] and 0.352% for fascial plane blocks.[4] For convenience of medication preparation, moreover, the concentrations of ropivacaine used commonly for nerve or fascial plane blocks in clinical practice were 0.25%, 0.375%, 0.5%, and 0.75%, with concentration gradients of 0.125–0.25%.

Fourth, other than the ESPB, postoperative analgesic protocols only included rescue drugs, such as intravenous fentanyl 50 mcg in the postanesthesia care unit and intravenous tramadol 50 mg and intramuscular diclofenac 75 mg in the wards when the pain score was more than 6. This does not meet the requirements of the current best practices of enhanced recovery after surgery protocols for thoracoscopic surgery, which recommend an opioid-sparing multimodal analgesic strategy including a serial of nonopioid analgesics with different mechanisms, such as acetaminophen, nonsteroidal anti-inflammatory drugs, NMDA receptor antagonists, steroids, and others.[5] To achieve adequate coanalgesia, nonopioid analgesics are also required to administer before or during operation and regularly repeat after surgery. We believe that different results comparing postoperative analgesic efficacies of the ESPB with three ropivacaine concentrations would have been obtained if a standard opioid-sparing multimodal analgesic strategy was included in this study design.

Finally, the mean pain scores within 6 h postoperatively in three groups were 4 or more, with large interquartile ranges, indicating that a significant proportion of patients experienced moderate to severe pain in early postoperative period. This is not ideal for the successful use of current enhanced recovery after surgery practice for thoracoscopic surgery, which requires to maintain a pain score of 3 or less for patient comfort.[5] Thus, we argue that this study does not provide enough evidence where the concentration of ropivacaine is optimal for postoperative pain control as the ESPB with three ropivacaine concentrations does not achieve adequate early postoperative analgesia.

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Conflicts of interest

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