



Continuous paravertebral block combined with multilevel single-shot intercostal nerve blocks for pain control after thoracotomy

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To the Editor:

By conducting a small-sample randomized controlled trial of 70 patients who underwent thoracotomy, Kumar et al. [1] evaluated the postoperative analgesic efficacy of a combination of continuous paravertebral block (PVB) and multilevel single-shot intercostal nerve block (ICNB) by comparing to continuous PVB alone. They showed that a combination of two blocks provided effective pain control after thoracotomy with decreased opioid consumption. The authors should be appreciated for their attempt to find a better postoperative analgesic method for thoracotomy, which is one of the most painful surgical approaches [2]. However, there are several issues in this study that need further clarifications.

First, the authors did not provide the thoracotomy approaches and surgical types, though they can result in different tissue injuries and are closely associated with postoperative pain intensity [2]. For example, posterolateral approach generally remains within a single dermatome, whereas the anterolateral approach may cross several dermatomes. Because of a decreased field of surgical view, moreover, anterolateral thoracotomy may result in increased pain from excessive rib retraction and damage to the intercostal nerves [3]. In addition, different surgeries may cause various bronchi, lungs, pericardium and visceral pleura damages that are contributable to postoperative visceral pain [2].

Thus, we believe that clarification of these unknown factors would improve the transparency of this research design.

Second, the catheter of continuous PVB was inserted by the surgeon under direct vision prior to closure of the thoracotomy wound, but the five-level single-shot ICBB was performed by the anesthesiologist under ultrasound guidance after the completion of surgery. Available literature indicates that the multilevel single-shot ICNB performed by a surgeon under direct vision before closure of the thoracotomy wound is a simple, safe and time-saving postoperative analgesic technique [4]. We are very interested in knowing why the multilevel single-shot ICBB was not carried out by the surgeon under direct vision before the end of surgery.

Third, actual nalbuphine consumption with patient-controlled intravenous analgesia within 24 h after surgery was significantly increased in the patients receiving PVB alone, but the total consumptions of tramadol as a rescue analgesic within 24 h after surgery were not significantly different between groups. When comparing between-group difference of total opioid consumption, however, it is often required that dosages of all opioid analgesics used for pain control should be converted into total morphine milligram equivalents (MMEs). According to the published literature [5], the conversion factors for equivalent dose conversion to morphine for nalbuphine and tramadol are 1 and 0.1, respectively. Thus, total MMEs of nalbuphine and tramadol consumptions within 24 h after surgery are about 41.4 and 34.6 in patients receiving PVB alone and a combination of two blocks, respectively (Table 1). The total MMEs of opioid consumptions for pain control within 24 h after surgery were also significantly increased in patients receiving PVB alone, but a between-group difference of 6.8 in the total MMEs did not exceed the recommended minimal clinically important difference, that is, a reduction of 10 mg intravenous morphine within 24 h [6]. Thus, we questioned the clinical

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Table 1 Total consumptions of nalbuphine and tramadol within 24 h after surgery and their morphine milligram equivalents (MMEs)

		PVB group	PVB combined with ICNB	<i>P</i> values
Nalbuphine	Actual consumption	28.3 (13.4)	22.6 (7.8)	0.03
	MMEs	28.3 (13.4)	22.6 (7.8)	0.03
Tramadol	Total consumption	131.4 (32.3)	120 (36.8)	0.17
	MMEs	13.1 (3.2)	12.0 (3.7)	0.17

Values are present as mean (SD). $n = 35$ in each group

significance of opioid sparing with a combination of PVB and ICNB compared to PVB alone in this study.

Finally, PVB itself can provide a complete coverage of the hemithorax and is the preferred local analgesic technique for open thoracotomy, because it is as effective as thoracic epidural analgesia but with fewer adverse effects [3]. In contrast, ICNB can only provide the anterolateral coverage of the thorax in front of the puncture point, which may not exceed the coverage area of PVB. That is, addition of multilevel single-shot ICNB to a PVB may only increase procedure time and local anesthetic dose without any additional benefits of pain control. Thus, it is somewhat difficult for the reader to understand this study design behind opting for a combination of PVB and ICNB. In fact, the results of this study that resting and active pain levels at all observed time points postoperatively and patient satisfaction with postoperative analgesia are not significantly improved by a combination PVB and ICNB when compared to PVB alone are expected. Unlike the PVB, erector spinae plane block may fail to provide a consistent block of the anterior and anterolateral aspects of the thorax [7, 8]. Perhaps, it would be worth adding multilevel single-shot ICNB to an erector spinae plane block for pain control after open thoracotomy or thoracoscopic surgery.

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 All authors have no financial support and potential conflicts of interest for this work.

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