



Editorial

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Corresponding author:

Seong-Hyop Kim, M.D., Ph.D.

Department of Anesthesiology and Pain Medicine, Konkuk University Medical Center, Konkuk University School of Medicine, 120-1 Neudong-ro, Gwangjin-gu, Seoul 05030, Korea

Tel: +82-2-2030-5454

Fax: +82-2-2030-5449

Email: yshkim75@daum.net

ORCID: <https://orcid.org/0000-0001-7764-9818>

Determinants for the duration of a single-shot interscalene brachial plexus block: concentration vs. volume of local anesthetics

Seong-Hyop Kim^{1,2,3}

¹Department of Anesthesiology and Pain Medicine, Konkuk University Medical Center, Departments of ²Infection and Immunology, ³Medicine, Institute of Biomedical Science and Technology, Konkuk University School of Medicine, Seoul, Korea

Interscalene brachial plexus block (ISB) has been widely used to control postoperative pain in patients undergoing shoulder and arm surgeries. Continuous ISB with catheter insertion has been shown to be more effective than single-shot ISB for postoperative pain control. However, catheter-related complications, such as dislodgement and infection, should be considered when using continuous ISB with a catheter. When single-shot ISB is chosen for the fear or prevention of catheter-related complications, the duration of ISB is critical to achieve effective postoperative pain control. There are various determinants for the duration of nerve block. Local anesthetics, itself, have two determinants for the duration of nerve block, the concentration and volume, regardless of the characteristics of the local anesthetic used. Pippa et al. [1] reported that low concentration and high volume of local anesthetics for ISB covered more block areas and avoided complications, compared with high concentration and low volume of local anesthetics at the same dose. However, Zhai et al. [2] reported that ropivacaine 50 mg with 0.25, 0.5, or 0.75% with different volumes for ISB had similar block results, although 0.75% showed a faster onset.

The current issue of the *Korean Journal of Anesthesiology* deals with the effect of the concentration and volume of local anesthetics in single-shot ISB on the characteristics of the block. Lee et al. [3] compared 0.75% ropivacaine 10 ml and 0.375% ropivacaine 20 ml with a fixed dose of 75 mg in patients undergoing arthroscopic shoulder surgeries. They found that low concentration and high volume (0.375% ropivacaine 20 ml) was effective in reducing the postoperative opioid requirement within 24 h of the surgery, although it was associated with a longer onset and did not prolong the duration of the block. They also checked pulmonary function using a spirometer, before and after ISB. Similar changes in pulmonary function after ISB were observed with the use of 0.75% ropivacaine 10 ml and 0.375% ropivacaine 20 ml.

To achieve successful ISB without complications, the minimal effective concentration with minimal effective volume of the local anesthetic should be determined and used. This can only be achieved if the needle for ISB is positioned correctly. Although nerve stimulators and ultrasonography have been used for the success of ISB, it remains difficult to find the minimal effective concentration and minimal effective volume of the local anesthetic for individual patients.

There is controversy over the concentration and volume of local anesthetics to be prioritized in single-shot ISB to control postoperative pain in patients undergoing shoulder and arm surgeries. Considering that a higher concentration of local anesthetics with a longer duration is known to be associated with local anesthetic toxicities [4], a trial to reduce the concentration could be prioritized in single-shot ISB.

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In conclusion, the study by Lee et al. [3] might be helpful in providing evidence that the use of ropivacaine at a lower concentration for ISB had a beneficial effect, compared with the higher concentration. However, further studies are needed to clarify the priority of the concentration and volume of local anesthetics to achieve a longer duration of ISB without complications.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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