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Effect of Suprascapular and Axillary Nerve Blocks on Postoperative Pain and Pain-Related Cytokines After Arthroscopic Rotator Cuff Repair: A Randomized Controlled Trial

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Introduction and Background

Suprascapular nerve block (SSNB) is widely used to reduce postoperative pain following arthroscopic rotator cuff repair and is often combined with axillary nerve block (ANB). This study aimed to evaluate the effects of SSNB and ANB on postoperative pain, patient satisfaction, and pain-related cytokine responses during the first 48 hours after arthroscopic rotator cuff repair.

Material and Method

Sixty-one patients undergoing arthroscopic rotator cuff repair were prospectively enrolled and randomly assigned to two groups. Preemptively, thirty patients received ultrasound-guided SSNB and ANB using 10 mL of 0.75% ropivacaine each (Group 1), whereas 31 patients received ultrasound-guided SSNB and ANB using equal volumes of saline (Group 2). Postoperative visual analog scale (VAS) pain scores, patient satisfaction (SAT) scores, and plasma concentrations of pain-related cytokines were assessed for 48 hours. (Fig. 1).

Results

Group 1 demonstrated significantly lower mean VAS scores from 1, 3, 6, 12, 18, 24 and 36 hours postoperatively ($p<0.001$, $p<0.001$, $p<0.001$, $p=0.001$, $p=0.010$, $p=0.043$ and $p=0.007$) and significantly higher SAT scores from 1, 3, 6, 12, 18, 24, 36 and 48 hours ($p<0.001$, $p<0.001$, $p<0.001$, $p<0.001$, $p<0.001$, $p<0.001$, $p<0.001$ and $p<0.001$) compared with Group 2. In addition, Group 1 showed markedly lower levels of IL-6 at 1 hour ($p=0.009$); IL-8 at 12 and 24 hours ($p=0.001$ and $p=0.001$); IL-1β at 6 and 12 hours ($p=0.001$ and $p=0.021$); substance P at 1 hour ($p=0.009$); and serotonin at 1 and 48 hours ($p=0.008$ and $p=0.019$) after surgery than group 2 (Fig. 2).

Conclusions

Combined SSNB and ANB significantly improved postoperative pain control within the first 36 hours and enhanced patient satisfaction within 48 hours following arthroscopic rotator cuff repair. The associated reductions in pain-related cytokines suggest that these biomarkers may serve as objective indicators of postoperative pain.

Figure & Table 1.

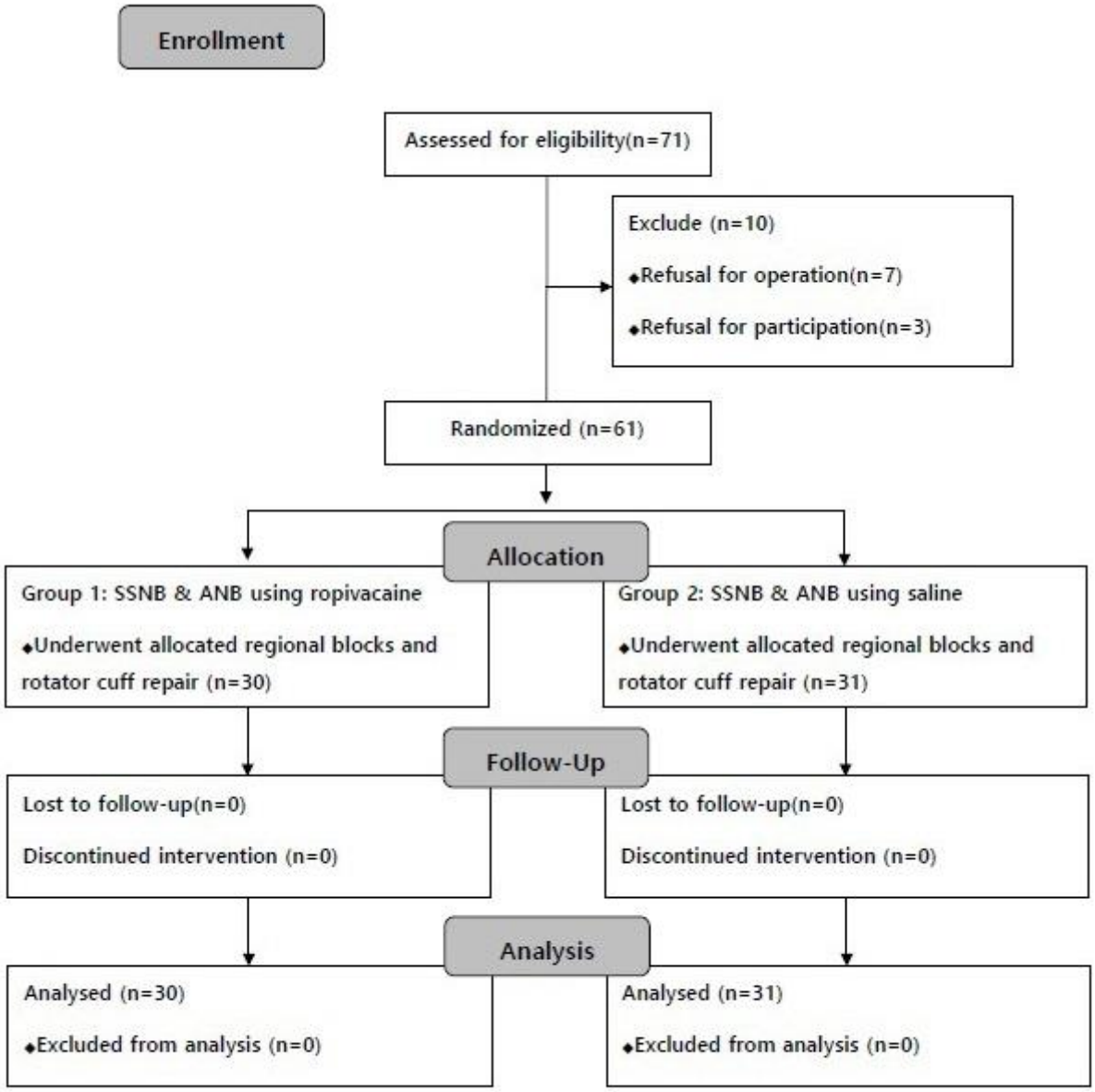

Fig 1. Flow diagram of the present study. SSNB: suprascapular nerve block, ANB: axillary nerve block.

Figure & Table 2.

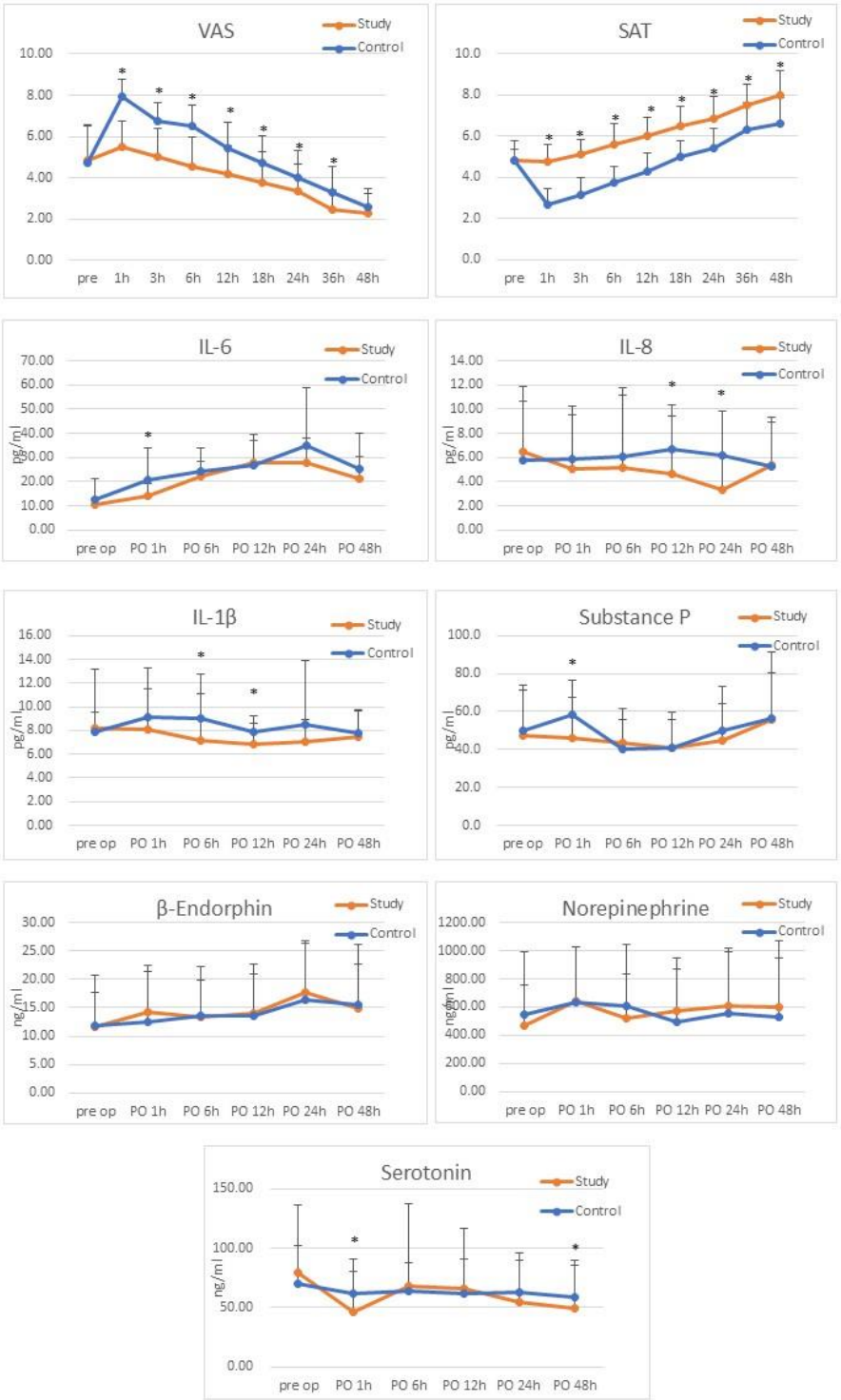

Fig.2 Clinical outcomes and pain-related cytokines between study (Group 1) and control (Group 2) groups. Values are presented as mean with a positive bar of SD. VAS: visual analog scale pain score, SAT: patient satisfaction score, IL-6: interluekin-6, IL-8: interleukin-8, IL-1β: interleukin-1 beta. Asterisk indicates a significant difference (p<0.05).