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LETTER

Efficacy of Dexmedetomidine as an Adjuvant to Ropivacaine for Intercostal Nerve Block in Elderly Patients Undergoing Video-Assisted Thoracoscopic Esophagectomy: A Randomized Double-Blinded Trial [Letter]

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Dear editor

We read with great interest the article entitled "Efficacy of Dexmedetomidine as an Adjuvant to Ropivacaine for Intercostal Nerve Block in Elderly Patients Undergoing Video-Assisted Thoracoscopic Esophagectomy: A randomized Double-Blinded Trial" published in *Journal of Pain Research*.[1] This study demonstrated through a randomised double-blind trial that, in elderly patients undergoing thoracoscopic oesophageal cancer resection, dexmedetomidine administered as an adjuvant to ropivacaine for intercostal nerve block significantly prolonged analgesic duration, effectively mitigated perioperative stress responses, and reduced the incidence of atelectasis. We commend the authors for their valuable contribution to the field of postoperative analgesia in thoracic surgery. However, we wish to discuss several methodological aspects that could be improved, with the aim of strengthening the evidence base for future research and gaining deeper insights into the mechanism of action of dexmedetomidine.

Implementation Flaws in the Double-Blind Design

The injection volumes (25 mL versus 20 mL) and final ropivacaine concentrations (0.2% versus 0.25%) differed between the experimental and control groups. This inconsistency introduced a significant confounding factor, as the larger injection volume itself may have enhanced the block effect by improving drug diffusion. Consequently, it remains unclear whether the observed analgesic advantage should be attributed to the intrinsic pharmacological action of dexmedetomidine or to its physical volume effect. Furthermore, the macroscopically discernible volume disparity between groups compromised the double-blind principle in practice, introducing a risk of unconscious performance bias for the anaesthetists administering the procedure. Consequently, the study findings may overestimate dexmedetomidine's true efficacy, challenging the internal validity of the conclusions. Future studies that rigorously match injection volume with drug concentration would enable a purer and more accurate assessment of its efficacy as a neuroblocking adjuvant.

Multidimensional Pain Assessment

The Visual Analogue Scale (VAS) was utilised as a metric to evaluate the intensity of pain during rest. However, postoperative functional recovery is more closely associated with activity-related pain, such as that experienced during coughing or deep breathing.[2] Evaluating resting pain alone may underestimate the full analgesic benefits of interventions. For instance, activity-related pain serves as a stronger predictor of pulmonary complications and the development of chronic postoperative pain. We recommend that future studies incorporate assessments of activity-related pain (eg, VAS

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scores during coughing or movement) to more comprehensively evaluate analgesic efficacy and its impact on functional recovery.

Monitoring of the Inflammatory Response

The authors comprehensively monitored neuroendocrine stress markers (adrenaline, noradrenaline, cortisol) but did not assess the inflammatory response induced by surgery. Surgical intervention triggers a significant inflammatory response characterised by the release of cytokines such as IL-6, which is associated with pain sensitisation and postoperative complications. Dexmedetomidine may alleviate chronic pain following thoracoscopic surgery and promote recovery through its anti-inflammatory and antioxidant effects.[3] Monitoring inflammatory biomarkers (eg, C-reactive protein, IL-6, procalcitonin) would provide a more comprehensive understanding of dexmedetomidine's impact on the surgical stress response and may reveal additional mechanisms underlying its clinical benefits (such as the observed reduction in atelectasis).

Separate Assessment of Sensory and Motor Block

This study reported analgesic duration but did not separately evaluate sensory and motor block. An ideal peripheral nerve block adjuvant should aim to prolong sensory block without significantly extending motor block, thereby facilitating early mobilisation.[4] We recommend employing the modified Bromage score for motor assessment, alongside specific sensory tests (such as temperature or pinprick sensation), to aid in distinguishing sensory and motor effects. Quantifying sensory-motor dissociated block will help elucidate whether dexmedetomidine possesses unique advantages in facilitating recovery.

Limitation in Long-Term Outcome Assessment

The 48-hour postoperative follow-up in this study failed to encompass long-term indicators more pertinent to major oesophageal cancer surgery, such as time to discharge and incidence of chronic postoperative pain, which are crucial for evaluating the value of analgesic regimens. Consequently, it is recommended that future studies extend follow-up periods to several months or longer, incorporating patient-centred long-term outcome measures such as chronic postoperative pain incidence, quality of functional recovery, and patient-reported outcomes. This approach would provide a more comprehensive reflection of the long-term benefits of interventions.

Conclusion and Suggestions

The study provides crucial clinical evidence for the application of dexmedetomidine in intercostal nerve block. We believe that incorporating these recommendations into future studies will help elucidate the full spectrum of dexmedetomidine's mechanisms of action, optimise its clinical application within enhanced recovery after surgery protocols, and ultimately improve the prognosis for patients undergoing major thoracic surgery.

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Disclosure

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