Journal of Pain Research

Dovepress
Taylor & Francis Group

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LETTER

The Era of Precision Analgesia: Prospects and Future Directions for Enhancing ESPB Efficacy With Nalbuphine [Letter]

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Dear editor

Postoperative pain management for lumbar spine surgery is challenging due to severe pain from paraspinal tissue dissection and bone removal, which delays recovery and increases the risk of chronic pain.[1,2] While opioids are commonly used, their side effects, such as nausea, vomiting, and respiratory depression, limit their broader application. The erector spinae plane block (ESPB) is a promising technique that injects local anesthetics into the fascial plane to block spinal nerve branches, effectively reducing pain and opioid use.[3,4] With its simplicity, safety, and low complication rates, ESPB is widely applied in thoracic, abdominal, and spinal surgeries. However, the short duration of single-shot local anesthetics (<24 hours) limits its efficacy. Adding adjuvants like nalbuphine can extend analgesia, optimize pain control, and improve recovery outcomes.

We reviewed the study by Zhang,[5] which used a single-center, prospective, randomized, double-blind trial to assess the analgesic effects of nalbuphine as an adjuvant to ropivacaine in ESPB. It demonstrated that combining nalbuphine with ropivacaine significantly extended analgesia duration and reduced opioid use, offering a promising approach to optimize pain management.The study provides important evidence for postoperative pain management in lumbar trauma surgery. However, the study also has several limitations that warrant further discussion.

The study used a fixed dose of nalbuphine (10 mg per side) based on recommended guidelines, but individual differences in patient characteristics, such as weight and age, may affect drug sensitivity and lead to variations in analgesic effectiveness. Additionally, the lack of a placebo control group (eg, a saline group) makes it challenging to rule out psychological or procedural effects, potentially underestimating the true efficacy of the nalbuphine-ropivacaine combination. Postoperative analgesic needs may vary significantly due to factors such as pain sensitivity, psychological state, and educational background, yet the study did not use standardized tools to evaluate or adjust for these differences. Similarly, the influence of postoperative care, such as early mobilization or psychological support, was not fully considered, which may have affected pain scores and recovery outcomes.Lastly, the analysis focused primarily on single variables, such as the time to the first rescue analgesic, without investigating interactions between patient characteristics (eg, age, BMI, or intraoperative medication use) and analgesic outcomes.

Future studies should focus on optimizing the use of nalbuphine in ESPB. A dose-escalation study is needed to determine the optimal dose that balances effectiveness and safety. Including a placebo control group (eg, saline) is crucial to distinguish the true analgesic effects from psychological or procedural influences. Preoperative assessments, such as pain sensitivity or anxiety scales, can help account for patient-specific differences and ensure balanced randomization. Postoperative care measures, including early mobilization and psychological support, should be standardized and included as covariates in statistical analyses to minimize their impact on results. Additionally, multivariable analysis, such as multiple regression, should be used to explore the relationship between patient characteristics and analgesic

Received: 5 January 2025
Accepted: 29 January 2025
Published: 31 January 2025

outcomes, potentially identifying subgroup-specific effects. These measures will enhance the application of nalbuphine in ESPB, enabling more personalized and effective postoperative pain management and improving patient recovery.

Disclosure

The authors declare no conflicts of interest in this communication.

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https://doi.org/10.2147/JPR.S515829