Physiological responses and gene expression in ultrasound guided supraclavicular brachial plexus block: a comparative study

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Abstract:

Background/Aims: Ultrasound-guided supraclavicular brachial plexus block (BPB) has come into wider use as a regional anesthetic during upper limb operations. This study assessed the neurological and hemodynamic changes and gene expression after co-administration of midazolam or neostigmine with bupivacaine during supraclavicular BPB. Methods: The study involved 90 adults divided into three groups: control (bupivacaine), midazolam (bupivacaine plus midazolam), and neostigmine (bupivacaine plus neostigmine). Blood samples were taken and interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-α) mRNA levels were measured by real-time PCR, and oxidative stress markers were identified. In addition to the hemodynamic variables, the onset and duration of sensory and motor blockades, duration of analgesia, pain scores, time of first request for an analgesic, and amounts of analgesics ingested were evaluated. Results: Compared with the control and neostigmine groups, the midazolam group experienced longer sensory and motor blockades, prolonged analgesia, lower pain scores at 12 h and 24 h, and lower need for postoperative analgesics. Moreover, the midazolam group exhibited lower oxidative stress markers with a higher fold change in IL-6 and TNF-α mRNA levels. Conclusion: Midazolam co-administered with bupivacaine provided better analgesic quality than did neostigmine with bupivacaine. This might be due to its superior antioxidant and anti-inflammatory effects.

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