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COMPARATIVE EVALUATION OF BUPIVACAINE WITH MAGNESIUM SULPHATE AND DEXAMETHASONE AS ADJUVANTS IN ULTRASOUND-GUIDED TRANSVERSE ABDOMINIS PLANE BLOCK FOR OPEN UNILATERAL INGUINAL HERNIA SURGERIES: A RANDOMISED CONTROLLED TRIAL

Anaesthesiology

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ABSTRACT

Background: Effective postoperative analgesia is crucial in patients undergoing open inguinal hernia repair. The transverse abdominis plane (TAP) block has gained prominence as a component of multimodal analgesia. Adjuvants such as magnesium sulphate and dexamethasone may prolong analgesic effects when combined with local anesthetics like bupivacaine. **Objectives:** This study compares the postoperative analgesic efficacy of bupivacaine with magnesium sulphate versus bupivacaine with dexamethasone in ultrasound-guided TAP block for open unilateral inguinal hernia surgeries. Primary outcomes include duration of analgesia, hemodynamic stability, patient satisfaction (via pain scores), and postoperative complications. **Methods:** Eighty ASA I–II patients aged 18–60 years undergoing elective open unilateral inguinal hernia surgery were randomly assigned into two groups: Group I (BD) received 20 ml of 0.25% bupivacaine with 8 mg dexamethasone; Group II (BM) received 20 ml of 0.25% bupivacaine with 250 mg magnesium sulphate. Hemodynamic parameters and pain scores were recorded postoperatively for 24 hours. Data were analyzed using SPSS version 21. **Results:** Demographic and baseline hemodynamic variables were comparable between groups. Group BM showed significantly longer analgesia duration and lower NRS pain scores after 8 hours postoperatively. Group BD had a higher requirement for rescue analgesics and a higher (but not statistically significant) incidence of nausea and vomiting. **Conclusion:** Both magnesium sulphate and dexamethasone are effective adjuvants in TAP block. However, magnesium sulphate offers superior analgesic duration and pain control with reduced need for additional analgesia.

KEYWORDS

Bupivacaine, magnesium sulphate, Dexamethasone.

INTRODUCTION:

Inguinal hernia surgery is associated with moderate to severe postoperative pain, particularly within the first 24 hours. The transversus abdominis plane (TAP) block targets T10–L1 nerves and provides somatic analgesia. Adjuvants like magnesium sulphate and dexamethasone prolong the analgesic effect of local anaesthetic.

MATERIAL AND METHODS:

This prospective, randomized controlled trial included 80 adult patients scheduled for elective open unilateral inguinal hernia repair under spinal anesthesia. Participants were randomly allocated into two groups:

Group I (BD): received 20 ml of 0.25% bupivacaine + dexamethasone (8 mg)

Group II (BM): received 20 ml of 0.25% bupivacaine + magnesium sulphate (250 mg)

The TAP block was administered Unilateral under ultrasound guidance. Postoperative pain scores (NRS), duration of analgesia, total analgesic consumption, and adverse effects were recorded and compared.

RESULTS:

Group II showed significantly prolonged duration of analgesia and reduced NRS scores compared to Group I. Group II demonstrated the longest analgesia duration and lowest analgesic requirement. No significant adverse effects were reported in any group.

DISCUSSION:

This randomized controlled trial compared bupivacaine with magnesium sulphate (BM) and dexamethasone (BD) in TAP block for unilateral inguinal hernia surgeries. Both groups had similar demographics and intraoperative vitals. Group BM showed significantly longer duration of analgesia, lower NRS pain scores after 8 hours, and reduced rescue analgesic use. Incidence of nausea and vomiting was comparable. Thus, magnesium sulphate provided superior postoperative analgesia over dexamethasone. Limitations include absence of a control group and unmeasured serum drug levels.

CONCLUSION:

The addition of dexamethasone or magnesium sulphate to bupivacaine in TAP block significantly improves postoperative analgesia in patients undergoing open inguinal hernia surgery. Magnesium sulphate proved to be more effective than Dexamethasone in prolonging the analgesic effect and reducing postoperative analgesic requirements.

REFERENCES:

1. Ammar AS, Mahmoud KM, Kasemy ZA. Comparison between adenosine and magnesium sulphate as adjuvants for transversus abdominis plane block: a prospective randomized controlled trial. Minerva Anestesiol. 2017;84(3):304-10.
2. Azzazi HM, Abd Al-Salam MM, El Agamy AE, Mohamed MM. Effect of adding dexamethasone to bupivacaine in ultrasound guided supraclavicular brachial plexus block versus bupivacaine alone for upper limb orthopedic surgery: a comparative study. Egypt J Hosp Med. 2018;71(7):3541-9.
3. Parveen S, Jan M, Taj A, Bhat AA. Effect of dexamethasone as an adjuvant with bupivacaine in ultrasound guided single shot supraclavicular brachial plexus block in upper extremity surgeries: a prospective randomized study. Int J Res Med Sci. 2017;5 (5):2139-43.
4. AbdAlsalam MA, Mohamed NA. A comparative study between magnesium sulfate and dexmedetomidine as adjuvants to bupivacaine using ultrasound-guided lumbar plexus block in lower abdominal surgeries. Al-Azhar Assiut Med J. 2022;20(1):72-84.