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# COMPARATIVE EVALUATION OF BUPIVACAINE WITH MAGNESIUM SULPHATE VERSUS BUPIVACAINE WITH DEXAMETHASONE AS ADJUVANTS IN ULTRASOUND-GUIDED TRANSVERSUS ABDOMINIS PLANE BLOCK FOR POSTOPERATIVE ANALGESIA IN PATIENTS UNDERGOING OPEN INGUINAL HERNIA SURGERY: A RANDOMIZED COMPARATIVE STUDY

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## ABSTRACT

**Background:** Postoperative pain following open inguinal hernia repair is often moderate to severe, peaking within the first 24 hours. Ultrasound-guided transversus abdominis plane (TAP) block with bupivacaine provides effective somatic analgesia to the anterolateral abdominal wall, but its duration is limited by relatively rapid systemic absorption, prompting interest in adjuvants such as magnesium sulphate and dexamethasone to prolong and enhance the block. **Objective:** To compare the postoperative analgesic efficacy of bupivacaine with magnesium sulphate versus bupivacaine with dexamethasone as adjuvants in ultrasound-guided TAP block in patients undergoing elective open inguinal hernia repair under spinal anaesthesia. **Materials and Methods:** This prospective interventional study was conducted over 18 months in the Department of Anaesthesiology at a tertiary care teaching hospital. 112 patients (ASA I–II, 20–60 years) undergoing elective open unilateral or bilateral inguinal hernia repair under spinal anaesthesia were allocated to Group BM (bupivacaine 0.125% 20 mL with magnesium sulphate 200 mg) or Group BD (bupivacaine 0.125% 20 mL with dexamethasone 8 mg), 56 patients per group, receiving ultrasound-guided TAP block after surgery. Postoperative pain (Visual Analogue Scale, VAS) was assessed at 0, 1, 6, 12, 24, and 48 hours; time to first rescue analgesia, 24-hour analgesic consumption, haemodynamic parameters, adverse effects, and patient satisfaction were also compared. **Results:** Baseline demographic, anthropometric, surgical, and haemodynamic parameters were comparable between groups ($p>0.05$). VAS scores were similar at 0 and 1 hour, but from 6 hours onward Group BD showed significantly lower scores than Group BM (e.g., at 12 hours $2.47 \pm 0.24$ vs $3.54 \pm 0.22$; $p<0.001$). Time to first rescue analgesia was significantly longer in Group BD than Group BM ($593.42 \pm 31.04$ vs $418.67 \pm 24.10$ minutes; $p<0.001$). Total 24-hour paracetamol consumption ($1214.28 \pm 249.67$ vs $1946.43 \pm 422.96$ mg; $p<0.001$) and number of rescue analgesic doses ($1.53 \pm 0.50$ vs $2.42 \pm 0.49$; $p<0.001$) were significantly lower in Group BD. Intraoperative hypotension, bradycardia, and postoperative nausea and vomiting were comparable between groups ($p>0.05$), while high patient satisfaction scores were significantly more frequent in Group BD ($p<0.001$). **Conclusion:** When added to bupivacaine for ultrasound-guided TAP block after open inguinal hernia repair, dexamethasone provides longer-lasting postoperative analgesia, reduces analgesic consumption, and improves patient satisfaction compared with magnesium sulphate, without increasing adverse effects, supporting its preferential use as a TAP block adjuvant in this population.

## INTRODUCTION

Pain remains one of the most distressing and feared consequences of surgery, defined as an unpleasant sensory and emotional experience arising from actual or potential tissue injury. Inguinal hernia repair, one of the most frequently performed general surgical procedures, is particularly known for producing moderate to severe postoperative pain, with peak intensity occurring within the first 24 hours after the operation.1 When inadequately treated, this acute pain not only delays mobilisation and prolongs hospital stay but may also predispose individuals to persistent postoperative pain syndromes, affecting long-term quality of life.[1]

Pharmacological adjuvants have increasingly been used to enhance regional anaesthesia techniques and limit reliance on systemic analgesics. Magnesium sulphate, a non-competitive antagonist at the N-methyl-D-aspartate (NMDA) receptor, blocks voltage-dependent calcium channels and dampens central sensitisation triggered by peripheral nociceptive input, potentially blunting the inflammatory and autonomic response to surgical stress.[2,3,4,5] Dexamethasone, a potent synthetic glucocorticoid, is believed to prolong local anaesthetic action by reducing nociceptive C-fibre activity through glucocorticoid receptor-mediated inhibition of potassium conductance, while its systemic anti-inflammatory and local vasoconstrictive effects decrease vascular absorption of local anaesthetics, further extending analgesia.[6,7,8]

With growing emphasis on multimodal, opioid-sparing analgesia, fascial plane blocks such as the transversus abdominis plane (TAP) block have become valuable components of enhanced recovery protocols for abdominal surgery.[9,10] By depositing local anaesthetic in the fascial plane between the internal oblique and transversus abdominis muscles, where the anterior rami of T10–L1 nerves course, the TAP block provides targeted somatic analgesia to the anterolateral abdominal wall.[11] Bupivacaine, a long-acting amide local anaesthetic, is the agent most commonly used for TAP block owing to its favourable duration and sensory blockade, but its analgesic effect may be limited by relatively rapid systemic absorption from the vascular fascial planes, necessitating adjuvants to enhance and prolong its action.

Although both magnesium sulphate and dexamethasone have individually been shown to prolong TAP block analgesia, direct comparative data on the two adjuvants in patients undergoing open inguinal hernia repair remain limited. This study was therefore undertaken to compare the postoperative analgesic efficacy of bupivacaine combined with magnesium sulphate versus bupivacaine combined with dexamethasone as adjuvants in ultrasound-guided TAP block, with particular attention to duration of analgesia, postoperative pain control, rescue analgesic requirement, and safety profile in patients undergoing elective open unilateral or bilateral inguinal hernia repair.

**Aims and Objectives**

To compare the postoperative analgesic efficacy of bupivacaine with magnesium sulphate versus bupivacaine with dexamethasone as adjuvants in ultrasound-guided transversus abdominis plane (TAP) block in patients undergoing elective open inguinal hernia repair.

## MATERIALS AND METHODS

**Study Design and Setting**

This prospective interventional study was conducted in the Department of Anaesthesiology at PES Institute of Medical Sciences and Research (PESIMSR), Kuppam, a tertiary care teaching hospital, over a period of 18 months (April 2024 to October 2025), after Institutional Ethics Committee approval and written informed consent from all participants in a language they understood.

**Study Population and Sampling**

Patients scheduled for elective open unilateral or bilateral inguinal hernia repair under spinal anaesthesia were enrolled using a purposive sampling method and allocated to one of two groups based on sequence number (even-numbered patients to Group BM, odd-numbered patients to Group BD).

**Sample Size**

The sample size was calculated based on the study by Shambhavi et al.,[12] which gave a minimum requirement of 56 patients per group. Accordingly, 112 patients were enrolled, with 56 allocated to each group.

**Inclusion Criteria**

- Patients aged between 20 and 60 years
- Patients of either gender
- Patients belonging to American Society of Anaesthesiologists (ASA) physical status I and II
- Patients scheduled for elective open unilateral or bilateral inguinal hernia surgery under spinal anaesthesia

**Exclusion Criteria**

- Patients with infection at the injection site
- Patients with clotting abnormalities
- Patients with liver or renal abnormalities
- Patients with known allergy to local anaesthetics or the study drugs
- Patients with a history of substance abuse
- Patients with body mass index (BMI) >35 kg/m²
- Patients with psychosis or gross neurological disorders

**Anaesthetic and TAP Block Protocol**

All patients underwent detailed pre-anaesthetic evaluation and were premedicated with oral alprazolam 0.5 mg the night before and on the morning of surgery. An intravenous line was secured, and patients were preloaded with 500 mL Ringer


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lactate after intravenous ondansetron. Spinal anaesthesia was administered with 0.5% hyperbaric bupivacaine 3 mL, targeting a sensory block height of T6. Intraoperative hypotension (fall in systolic blood pressure >30% from baseline) was treated with incremental mephentermine 3 mg and a 200 mL Ringer lactate bolus, and bradycardia (heart rate <60/min) with intravenous atropine 0.5 mg.

After completion of surgery and regression of the spinal block to the T10 dermatome, patients received an ultrasound-guided TAP block using a high-frequency linear array transducer (6–13 MHz), or a lower-frequency curvilinear probe (2–5 MHz) in patients with increased subcutaneous thickness. Using an in-plane technique, local anaesthetic was deposited between the internal oblique and transversus abdominis muscles, confirmed by the characteristic "kayak sign" of fascial plane spread. Group BM received 0.125% bupivacaine 20 mL with magnesium sulphate 200 mg, and Group BD received 0.125% bupivacaine 20 mL with dexamethasone 8 mg. Patients were observed for 15 minutes before transfer to the post-anaesthesia care unit.

**Outcome Measures**

The primary outcomes were postoperative pain scores assessed using the Visual Analogue Scale (VAS: no pain 0–4 mm, mild 5–44 mm, moderate 45–74 mm, severe 75–100 mm) at 0, 1, 6, 12, 24, and 48 hours by an independent anaesthesiologist, and consumption of rescue analgesics (intravenous paracetamol 15–20 mg/kg, given when VAS ≥4) over the first 24 postoperative hours. Secondary outcomes were intraoperative and postoperative haemodynamic parameters, drug-related adverse effects, and patient satisfaction.

**Statistical Analysis**

Data were entered in Microsoft Excel and analysed using SPSS software version 23.0. Continuous variables were expressed as mean ± standard deviation and compared using Student's t-test; categorical variables were expressed as frequencies and percentages and compared using the Chi-square test. A p-value <0.05 was considered statistically significant.

## RESULTS

A total of 112 patients (56 in each group) completed the study. Group BM denotes bupivacaine with magnesium sulphate and Group BD bupivacaine with dexamethasone.

**Demographic, Anthropometric, and Surgical Characteristics**

The mean age was 42.16 ± 12.87 years in Group BM and 40.94 ± 10.31 years in Group BD (p=0.790). Gender distribution (34 male/22 female vs 25 male/31 female; p=0.848), ASA physical status (25 ASA I/31 ASA II vs 32 ASA I/24 ASA II; p=0.703), anthropometric parameters, and BMI category distribution (p=0.501) were all comparable between groups (Table 1). Site of hernia (unilateral/bilateral; p=0.850) and duration of surgery (p=0.348) were also comparable between groups (Table 2), confirming baseline equivalence.

**Table 1: Demographic, Anthropometric, and Baseline Characteristics**

| Characteristic | Group BM (n=56) | Group BD (n=56) | P value |
|---|---|---|---|
| **Age (years)** | | | |
| Mean ± SD | 42.16 ± 12.87 | 40.94 ± 10.31 | 0.790 |
| **Gender** | | | |
| Male | 34 | 25 | 0.848 |
| Female | 22 | 31 | |
| **ASA Physical Status** | | | |
| ASA I | 25 | 32 | 0.703 |
| ASA II | 31 | 24 | |
| **Anthropometric Parameters (Mean ± SD)** | | | |
| Weight (kg) | 68.12 ± 7.23 | 67.44 ± 7.52 | 0.989 |
| Height (cm) | 165.05 ± 6.11 | 164.35 ± 6.27 | 0.816 |
| BMI (kg/m²) | 25.10 ± 3.23 | 25.06 ± 3.33 | 0.932 |
| **BMI Category** | | | |
| Normal (18.5–24.9) | 27 | 34 | 0.501 |
| Overweight (25–29.9) | 25 | 16 | |
| Obese (>30) | 4 | 6 | |

**Table 2: Surgical Characteristics**

| Characteristic | Group BM (n=56) | Group BD (n=56) | P value |
|---|---|---|---|
| **Site of Hernia** | | | |
| Unilateral | 33 | 29 | 0.850 |
| Bilateral | 23 | 27 | |
| **Duration of Surgery (min), Mean ± SD** | | | |
| Duration | 69.80 ± 14.51 | 67.85 ± 13.33 | 0.348 |

**Haemodynamic Parameters:** Baseline heart rate, systolic and diastolic blood pressure, and $SpO_2$ were comparable between groups (Table 3). Heart rate, systolic blood pressure, diastolic blood pressure, and $SpO_2$ also remained statistically comparable between groups at all recorded intraoperative and postoperative time points from 10 minutes to 24 hours (all p>0.05) (Tables 4–6).


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**Table 3: Baseline Haemodynamic Parameters**

| Parameter | Group BM (Mean ± SD) | Group BD (Mean ± SD) | P value |
|---|---|---|---|
| Heart Rate (beats/min) | 79.37 ± 6.08 | 78.78 ± 5.73 | 0.497 |
| Systolic BP (mmHg) | 120.69 ± 5.18 | 119.07 ± 6.44 | 0.170 |
| Diastolic BP (mmHg) | 77.67 ± 4.76 | 77.83 ± 4.44 | 0.156 |
| $SpO_2$ (%) | 98.41 ± 1.14 | 98.42 ± 1.17 | 0.404 |

**Table 4: Heart Rate at Different Time Intervals**

| Time Interval | Group BM (Mean ± SD) | Group BD (Mean ± SD) | P value |
|---|---|---|---|
| 10 minutes | 82.80 ± 7.39 | 83.35 ± 8.06 | 0.971 |
| 30 minutes | 81.16 ± 7.47 | 81.48 ± 7.43 | 0.883 |
| 1 hour | 80.66 ± 7.31 | 82.64 ± 7.28 | 0.312 |
| 2 hours | 81.32 ± 7.06 | 82.23 ± 7.57 | 0.521 |
| 4 hours | 81.73 ± 6.80 | 84.05 ± 7.33 | 0.108 |
| 6 hours | 82.71 ± 7.14 | 80.32 ± 7.07 | 0.147 |
| 12 hours | 85.39 ± 6.73 | 82.75 ± 7.56 | 0.083 |
| 24 hours | 83.37 ± 7.36 | 84.05 ± 7.47 | 0.694 |

**Table 5: Systolic and Diastolic Blood Pressure at Different Time Intervals**

| Time Interval | Group BM (Mean ± SD) | Group BD (Mean ± SD) | P value |
|---|---|---|---|
| **Systolic Blood Pressure (mmHg)** | | | |
| 10 minutes | 122.25 ± 7.86 | 123.92 ± 8.23 | 0.394 |
| 30 minutes | 123.16 ± 7.71 | 124.39 ± 7.16 | 0.472 |
| 1 hour | 122.51 ± 7.51 | 121.46 ± 6.95 | 0.502 |
| 2 hours | 124.03 ± 7.98 | 122.30 ± 7.41 | 0.348 |
| 4 hours | 122.00 ± 7.24 | 122.21 ± 7.88 | 0.905 |
| 6 hours | 124.01 ± 6.64 | 123.48 ± 7.94 | 0.742 |
| 12 hours | 123.12 ± 6.98 | 123.76 ± 7.12 | 0.657 |
| 24 hours | 122.03 ± 6.62 | 121.58 ± 7.87 | 0.801 |
| **Diastolic Blood Pressure (mmHg)** | | | |
| 10 minutes | 79.62 ± 6.94 | 81.21 ± 5.67 | 0.192 |
| 30 minutes | 79.05 ± 5.99 | 80.55 ± 5.99 | 0.218 |
| 1 hour | 81.33 ± 6.45 | 79.82 ± 5.22 | 0.167 |
| 2 hours | 81.42 ± 5.35 | 78.73 ± 6.10 | 0.061 |
| 4 hours | 80.25 ± 6.34 | 80.10 ± 6.25 | 0.914 |
| 6 hours | 80.16 ± 5.55 | 78.78 ± 5.14 | 0.186 |
| 12 hours | 79.01 ± 5.56 | 80.85 ± 5.97 | 0.114 |
| 24 hours | 79.58 ± 5.90 | 79.87 ± 6.06 | 0.508 |

**Table 6: $SpO_2$ at Different Time Intervals**

| Time Interval | Group BM (Mean ± SD) | Group BD (Mean ± SD) | P value |
|---|---|---|---|
| 10 minutes | 98.14 ± 1.35 | 97.91 ± 1.41 | 0.349 |
| 30 minutes | 97.83 ± 1.33 | 97.83 ± 1.39 | 1.000 |
| 1 hour | 98.39 ± 1.24 | 97.89 ± 1.34 | 0.067 |
| 2 hours | 97.94 ± 1.46 | 97.91 ± 1.51 | 0.913 |
| 4 hours | 97.96 ± 1.52 | 97.96 ± 1.42 | 1.000 |
| 6 hours | 98.21 ± 1.41 | 98.10 ± 1.34 | 0.704 |
| 12 hours | 97.76 ± 1.38 | 97.96 ± 1.24 | 0.439 |
| 24 hours | 98.10 ± 1.30 | 97.87 ± 1.42 | 0.381 |

### Intraoperative Adverse Events

Intraoperative hypotension (32 vs 29 patients; p=0.702) and bradycardia (27 vs 20 patients; p=1.00) were comparable between groups, and all episodes were transient and managed appropriately. [Table 7]

**Table 7. Intraoperative Adverse Events**

| Event | Group BM (n=56) | Group BD (n=56) | P value |
|---|---|---|---|
| Hypotension | 32 | 29 | 0.702 |
| Bradycardia | 27 | 20 | 1 |

### Postoperative Pain Scores and Rescue Analgesia

VAS pain scores were similar in both groups at 0 and 1 hour. From 6 hours onward, Group BD showed significantly lower VAS scores than Group BM, a difference sustained through 48 hours (p<0.001 at all time points from 6 hours) (Table 8). Time to first rescue analgesia was significantly longer in Group BD than Group BM (593.42 ± 31.04 vs 418.67 ± 24.10 minutes; p<0.001), a prolongation of approximately 175 minutes. [Table 8]

**Table 8: Postoperative Pain Scores (VAS) and Time to First Rescue Analgesia**

| Parameter | Group BM (Mean ± SD) | Group BD (Mean ± SD) | P value |
|---|---|---|---|
| ***VAS Score*** | | | |


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| | | | |
|---|---|---|---|
| 0 hour | 0.00 ± 0.00 | 0.00 ± 0.00 | — |
| 1 hour | 1.00 ± 0.00 | 1.00 ± 0.00 | — |
| 6 hours | 3.25 ± 0.22 | 2.02 ± 0.22 | <0.001 |
| 12 hours | 3.54 ± 0.22 | 2.47 ± 0.24 | <0.001 |
| 24 hours | 2.57 ± 0.18 | 2.50 ± 0.17 | <0.001 |
| 48 hours | 2.00 ± 0.27 | 2.02 ± 0.24 | <0.001 |
| **Time to First Rescue Analgesia (minutes)** | | | |
| Time | 418.67 ± 24.10 | 593.42 ± 31.04 | <0.001 |

**Analgesic Consumption, Side Effects, and Patient Satisfaction**

Total 24-hour paracetamol consumption was significantly lower in Group BD than Group BM (1214.28 ± 249.67 vs 1946.43 ± 422.96 mg; p<0.001), as was the number of rescue analgesic doses required (1.53 ± 0.50 vs 2.42 ± 0.49; p<0.001). Nausea and vomiting were comparable between groups (p>0.05), while high patient satisfaction was significantly more frequent in Group BD than Group BM (p<0.001). [Table 9]

**Table 9: Analgesic Consumption, Side Effects, and Patient Satisfaction**

| Parameter | Group BM (n=56) | Group BD (n=56) | P value |
|---|---|---|---|
| **Analgesic Consumption over 24 Hours (Mean ± SD)** | | | |
| Total paracetamol (mg) | 1946.43 ± 422.96 | 1214.28 ± 249.67 | <0.001 |
| No. of rescue analgesic doses | 2.42 ± 0.49 | 1.53 ± 0.50 | <0.001 |
| **Side Effects and Satisfaction, n** | | | |
| Nausea | 34 | 23 | 0.570 |
| Vomiting | 30 | 24 | 1.00 |
| High satisfaction (score = 2) | 24 | 35 | <0.001 |

## DISCUSSION

Ultrasound-guided TAP block has gained wide acceptance as an effective regional analgesic technique for lower abdominal surgeries, including inguinal hernia repair, and several adjuvants have been investigated to prolong and enhance the analgesia it provides. The present study compared magnesium sulphate and dexamethasone as adjuvants to bupivacaine, with emphasis on postoperative pain scores, duration of analgesia, analgesic consumption, haemodynamic stability, adverse effects, and patient satisfaction.

Demographic, anthropometric, and surgical characteristics were comparable between groups in this study, consistent with the design of Shambhavi et al., who reported similar mean ages (41.2 ± 10.4 and 40.8 ± 9.9 years) between dexamethasone and magnesium groups undergoing TAP block,12 and with Agrawal et al., who documented comparable mean ages and BMI values (24.6–26.1 kg/m²) between the two adjuvant groups in inguinal hernia surgery.[13] Baseline heart rate, blood pressure, and $SpO_2$ were also similar between groups and remained stable throughout intraoperative and postoperative monitoring in the present study, in agreement with Shambhavi et al,[12] who found no significant intergroup differences in heart rate or blood pressure at any time point, and with Agrawal et al,[13] who reported stable haemodynamic profiles with both adjuvants and no episodes of clinically significant hypotension.

Intraoperative hypotension and bradycardia occurred in both groups in the present study but did not differ significantly between them, and all episodes were transient and responded promptly to standard management. This is consistent with Agrawal et al., who observed hypotension in approximately 20–25% of patients in both magnesium and dexamethasone groups with no clinically significant intergroup difference,[13] and with Ahmed Mostafa et al., who reported no significant difference in adverse events among magnesium sulphate, dexamethasone, and control groups in a paediatric erector spinae plane block study.[17] Although magnesium sulphate has calcium-channel-blocking and sympatholytic properties that could theoretically predispose to hypotension or bradycardia, the present findings indicate that at the doses used it does not produce clinically meaningful cardiovascular instability as a TAP block adjuvant.

VAS pain scores were similar between groups at 0 and 1 hour but were significantly lower in Group BD from 6 hours onward, a pattern that closely parallels the findings of Shambhavi et al., who reported significantly lower pain scores in the dexamethasone group at 6, 12, and 24 hours.[12] This contrasts with Rayala Aparna et al., who found significantly lower VAS scores with magnesium sulphate at most postoperative intervals in bilateral subcostal TAP block for laparoscopic cholecystectomy,[14] a discrepancy that may reflect differences in block technique, drug dose, surgical procedure, and pain assessment tools between studies rather than a fundamentally different mechanism of action.

The mean time to first rescue analgesia was prolonged by approximately 175 minutes with dexamethasone in the present study, closely matching the magnitude reported by Shambhavi et al. (596 vs 422 minutes).[12] In contrast, Amany S. Ammar et al. observed the longest duration of analgesia with magnesium sulphate (447 minutes) among the adjuvants they compared,[15] and Agrawal et al. similarly reported longer analgesia with magnesium than with dexamethasone,[13] underscoring that the relative superiority of either adjuvant for prolonging


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TAP block analgesia may vary with block technique and patient population.

Total 24-hour paracetamol consumption and the number of rescue analgesic doses were both significantly lower in Group BD than Group BM in the present study, in keeping with Shambhavi et al., who reported significantly lower postoperative tramadol consumption with dexamethasone than with magnesium sulphate.[12] Venkatraman et al. similarly demonstrated a marked reduction in postoperative analgesic requirement with ultrasound-guided TAP block using local anaesthetic compared with placebo, highlighting the analgesic-sparing effect of the TAP block itself,[16] while Ahmed Mostafa et al. reported significantly reduced rescue analgesic consumption with both magnesium sulphate and dexamethasone compared with plain bupivacaine in paediatric erector spinae plane block.[17] The comparatively lower analgesic consumption with dexamethasone observed in the present study may be attributable to its anti-inflammatory action, reduced perineural oedema, and prolongation of local anaesthetic effect. Nausea and vomiting were comparable between groups in the present study, with no serious drug-related complications in either arm, while patient satisfaction was significantly higher with dexamethasone, consistent with Shambhavi et al., who also reported greater patient satisfaction with dexamethasone alongside longer analgesic duration and lower opioid consumption.[12] In contrast, Rayala Aparna et al. reported higher satisfaction with magnesium sulphate, associated with lower VAS scores and reduced rescue analgesic requirement in their bilateral subcostal TAP block population,[14] suggesting that patient satisfaction after TAP block is more closely linked to the consistency and duration of analgesia achieved than to the specific choice of adjuvant.

**Limitations**

- Pain assessment relied on a subjective scoring system, which may be influenced by individual pain perception despite standardized evaluation methods.
- Long-term outcomes such as chronic postoperative pain, functional recovery, and late complications were not assessed.
- The study included only ASA I and II patients undergoing inguinal hernia surgery; the findings may not be applicable to higher-risk patients or other types of abdominal surgery.

## CONCLUSION

Both magnesium sulphate and dexamethasone are safe and effective adjuvants to bupivacaine in ultrasound-guided TAP block for postoperative analgesia after inguinal hernia surgery. Although early postoperative pain scores were similar, dexamethasone provided superior and more sustained analgesia from 6 hours onward, significantly prolonged the time to first rescue analgesia, reduced 24-hour analgesic consumption and the number of rescue doses required, and was associated with significantly higher patient satisfaction, without increasing adverse effects. Haemodynamic stability was preserved with both adjuvants throughout the intraoperative and postoperative period. These findings support the preferential use of dexamethasone over magnesium sulphate as an adjuvant to bupivacaine for TAP block in patients undergoing open inguinal hernia surgery.

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