



Original Research Article

EFFICACY OF MAGNESIUM SULPHATE COMPARED TO DEXAMETHASONE AS ADJUVANTS TO ROPIVACAINE IN ULTRASOUND GUIDED ILIOINGUINAL-ILIOHYPOGASTRIC BLOCK IN ADULT PATIENTS UNDERGOING ELECTIVE UNILATERAL INGUINAL HERNIA SURGERY UNDER SPINAL ANAESTHESIA

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ABSTRACT

Background: Ilioinguinal-iliohypogastric nerve block has now established itself as a component of a multimodal approach in perioperative analgesia for surgeries involving the lower abdomen. The aim is to compare the efficacy of addition of Magnesium Sulphate or Dexamethasone to Ropivacaine in ultrasound-guided ilioinguinal-iliohypogastric nerve block in adult male patients scheduled for elective unilateral open inguinal hernia surgery under spinal anaesthesia. The primary objective is to compare the duration of analgesia. Secondary objective is total analgesic consumption in 24 hours between two groups. To compare the adverse effects in both groups.

Materials and Methods: It was a prospective, randomised, double-blinded study. Following approval from the hospital ethics committee and obtaining written informed consent, we enrolled 100 adult male patients with ASA physical status I and II who were scheduled for elective open unilateral inguinal hernia surgery, under spinal anaesthesia, in our study. Patients were assigned randomly to one of two groups. Group- A (n=50): Patients received 10 ml of 0.375% Ropivacaine plus 2ml (8mg) of Dexamethasone (total 12ml) in II-IHNB. Group- B (n=50): Patients received 10 ml of 0.375% Ropivacaine plus 250 mg of Magnesium Sulphate in 2ml of normal saline (total 12ml) in II-IHNB.

Results: The mean duration of analgesia in group A was 816.00 ± 128.285 minutes while in group B it was 427.60 ± 51.885 minutes which was statistically significant. The need for rescue analgesia was significantly less in group A compared to group B. No adverse effects were observed in both the groups.

Conclusion: This study concludes that Dexamethasone is more effective than Magnesium Sulphate as an adjuvant to Ropivacaine in ultrasound-guided ilioinguinal- iliohypogastric nerve block.

Keywords: Dexamethasone, Magnesium Sulphate, Ropivacaine, ilioinguinal-iliohypogastric nerve block.

INTRODUCTION

Globally, hernioplasty is among the most extensively done surgical procedures. Inguinal hernia surgery is associated with a higher incidence of moderate to severe postoperative pain,^[1] resulting in poor patient satisfaction. If not managed appropriately, acute postoperative pain can escalate into chronic pain,

leading to a variety of conditions like post-herniorrhaphy groin pain, chronic postsurgical pain, and ultimately poor quality of life for patients.^[1] Effective management of acute postoperative pain is the cornerstone of early ambulation, enhanced recovery and faster patient discharge, resulting in immense patient satisfaction.^[2] This has resulted in the exploration of various techniques and approaches

to ameliorate postoperative pain in inguinal hernia surgery, including the use of local anaesthetics, regional blocks, and non-opioid medications.^[3-5]

However, the ideal pain management strategy for countering immediate post operative pain remains ambiguous. USG ilioinguinal-iliohypogastric nerve block provides an excellent pain management strategy by targeting the sensory nerves in fascial planes and offering potent postoperative analgesia. This approach is technically straightforward to perform and has minimal complications.^[6,7]

The three sensory nerves that traverse the inguinal canal in front of the transversalis fascia are the ilioinguinal, iliohypogastric, and genital branch of the genitofemoral nerve. Ilioinguinal-iliohypogastric nerve block has been used successfully and safely administered in both children and adults to provide pain relief following inguinal hernia surgery.

Ropivacaine is a relatively new local anaesthetic with a favorable safety profile and added advantage of less motor blockade.^[8] By antagonising the NMDA pathway, Magnesium Sulphate stops the central sensitisation that is caused by peripheral nociceptive stimulation of NMDA receptors.^[9] This is said to provide perioperative analgesia. Dexamethasone is a powerful, long-acting glucocorticoid that exhibits prolonged pain relief duration when coadministered with local anaesthetics.^[10,11] Systemic anti-inflammatory effects also have an additive effect following absorption via the vasculature.

The purpose of our study was to compare the effectiveness of Magnesium Sulphate and Dexamethasone as adjuvants to Ropivacaine in ultrasound-guided ilioinguinal-iliohypogastric nerve block in adult male patients posted for unilateral inguinal hernia surgery under spinal anaesthesia.

Aims and objectives of the study

The aim of our study was to assess the efficacy of addition of Magnesium sulphate or Dexamethasone to Ropivacaine in ultrasound-guided ilioinguinal-iliohypogastric nerve block, on the duration of analgesia in adult male patients for elective unilateral inguinal hernia surgery under spinal anaesthesia.

Primary Objective

- To compare the duration of analgesia between two groups.

Secondary Objectives

- Total analgesic consumption in 24 hours between two groups.
- To compare the adverse effects in both groups.

MATERIALS AND METHODS

Following approval from the hospital ethics committee and obtaining written informed consent, 100 adult male patients of ASA physical status I and II who were scheduled for unilateral inguinal hernia surgery under spinal anaesthesia were enrolled in our study.

It is a prospective, randomised, double-blind study carried out using computer-generated random

numbers. Study drugs are prepared by an anaesthesiologist not involved in the study. Anaesthesiologist who observes the patient is unaware of the study group until the end of the study.

Inclusion Criteria

Male patients in the age group between 18-60 years belonging to American society of anaesthesiologists (ASA) status I & II posted for elective non-relapsing unilateral inguinal hernia surgery under spinal anaesthesia were included in our study.

Exclusion Criteria

Patients with body mass index (BMI) ≥ 35 , known hypersensitivity to study drugs, on medication for chronic pain, anticoagulant therapy, patients with neurological deficits, psychiatric, neurological disorders and other contraindications to Peripheral nerve block are excluded from the study.

Demographic characteristics such as age, height, and weight were documented, and written informed consent was obtained. On the night before surgery, all patients were administered oral doses of Ranitidine 150mg and Alprazolam 0.25 mg. After the patients were shifted to the operating room, standard A.S.A. monitors, such as NIBP, E.C.G., and pulse oximeter (SpO₂), were attached. All patients were administered spinal anaesthesia in sitting position at L3-L4 or L4-L5 interspace using 25G Quincke spinal needle with 3ml of 0.5% hyperbaric Bupivacaine. 15 minutes after administration of subarachnoid block, ultrasound guided ilioinguinal-iliohypogastric nerve block (II-IHNB) was administered under strict aseptic precautions.

Patients were assigned randomly to one of two groups.

Group- A (n=50): Patients received 10 ml of 0.375% Ropivacaine plus 2ml (8mg) of Dexamethasone (total 12ml).

Group- B (n=50): Patients received 10 ml of 0.375% Ropivacaine plus 250 mg of Magnesium sulphate in 2ml of normal saline (total 12ml).

The ultrasound machine, (Sonosite SII, Fujifilm Sonosite Inc) was positioned on the contralateral side of the site of the block. A linear probe transducer (6-13 MHz) was utilized and covered with a sterile sleeve. Under aseptic precautions ilioinguinal-iliohypogastric nerve blocks were administered using an in-plane technique. The ilioinguinal and iliohypogastric nerves were visualized within the fascial plane between the transversus abdominis and internal oblique muscles above the ASIS. After verifying negative aspiration for blood, 12 ml of study drug was administered in real-time under ultrasound guidance. After administration of block, surgery was commenced. Haemodynamic parameters, including heart rate, blood pressure, and peripheral oxygen saturation, were assessed at regular time intervals. After completion of the surgical procedure, patients were shifted to post anaesthesia care unit (PACU).

Duration of analgesia was defined as the time interval between the end of local anaesthetic administration and the first administration of rescue analgesic (VAS \geq 4).

Paracetamol 1gm IV was administered as rescue analgesic when VAS \geq 4. After the patient was shifted to the PACU, pain assessment was performed every hour using the visual analogue scale for upto 24 hours. The VAS is a scale that ranges from 0 to 10, where 0 represents no pain and 10 represents the most intense pain.

Heart rate, mean arterial pressure, and SpO₂ were measured at specific time intervals following the surgery at 15 minutes, 1 hour, 2 hours, 4 hours, 6 hours, 8hours, 12 hours, 16hours, 20hours, and 24 hours. The occurrence of adverse effects, including bradycardia, hypotension, and postoperative nausea and vomiting, were also documented. Patients who reported experiencing nausea or vomiting were provided with Ondansetron 0.1 mg/kg IV. Heart rate less than 60 bpm was termed as bradycardia and was treated by administering 0.6 mg bolus of Atropine IV. Mean arterial pressure reduction less than 20% from the baseline was termed as hypotension and was managed by administering intravenous crystalloids. The trial concluded 24 hours after the block was administered. Total number of doses of rescue analgesics administered in 24hours was also documented.

Method of collection of data

Sample size: The sample size was calculated using the formula for comparison of means between the two groups. To detect a 20% difference in mean with 95% confidence interval and 80% power, we calculated that a minimum of 30 patients would be required per group. So, we enrolled a total of 100 patients for our study to compensate for loss to follow up. Hence, a total number of 50 patients in each group were selected for the study.

Statistical Analysis: The study was analyzed using the statistical package for the social sciences (SPSS) software version 29. The data in the current study consisted of either quantitative or qualitative data. The quantitative data was represented as mean +/- standard deviation (SD) and evaluated using student's unpaired t-test. The qualitative data was quantified as a percentage or fraction and then subjected to analysis using chi-square test. Additional data was presented through a variety of tables and charts using Microsoft Office Excel. A p-value less than or equal to 0.05 was deemed to be statistically significant.

RESULTS

In our study, demographic and anthropometric data such as age, weight, height, BMI, ASA physical status were equally distributed among two groups and hence were comparable with out any statistical significance. Duration of surgery in both the study groups was comparable and non significant. (Table 1)

Comparison of Duration of Surgery

Table 1: Comparison of duration of surgery between the study groups

	Group	N	Mean	Std. Deviation	p value
Duration of Surgery (in mins)	A	50	106.74	16.374	0.986(NS)
	B	50	106.80	17.313	

*Statistically significant difference (p < 0.05). **Highly significant difference (p < 0.01) NS=Not significant

The mean duration of surgery in group A was 106.74 \pm 16.374 mins and in group B it was 106.80 \pm 17.313 mins with a p value of 0.986. The comparison of the

duration of surgery between groups A and B revealed no statistically significant difference

Comparison of total duration of analgesia

Table 2: Comparison of total duration of analgesia between the study groups

	Group	N	Mean	Std. Deviation	p value
Total duration of analgesia (mins)	A	50	816.00	128.285	0.0001**
	B	50	427.60	51.885	

*Statistically significant difference (p < 0.05). **Highly significant difference (p < 0.01) NS=Not significant

The comparison of the duration of analgesia between groups A and B revealed a statistically significant difference. The mean duration of analgesia in group A was 816.00 \pm 128.285 mins and in group B it was

427.60 \pm 51.885 mins with a p value of less than 0.0001. The duration of analgesia was significantly longer in group A compared to group B.

Comparison of total number of rescue analgesics

Table 3: Comparison of total number of rescue analgesic requirements in 24 hours between the study groups

	0	Group		Total	p value
		A N(%)	B N(%)		
Total number of rescue analgesics in 24hours	0	0(0)	0(0)	0	0.0001**
	1	35(70)	7(14)	42	
	2	15(30)	42(84)	57	
	3	0(0)	1(2)	1	
Total		50	50	100	

*Statistically significant difference (p < 0.05)

**Highly significant difference (p < 0.01) NS=Not significant

In group A, 70% of patients required 1 dose, 30% required 2 doses, none required 3 doses of rescue

analgesia. In group B, 14% required 1 dose, 84% required 2 doses.

Comparison of visual analogue scale scores

Table 4: Comparison of VAS scores between groups A and B over time

VAS	Group	N	Mean	Std. Deviation	p value
0min	A	50	.00	.000	-
	B	50	.00	.000	
15min	A	50	.00	.000	-
	B	50	.00	.000	
1st hr	A	50	.00	.000	-
	B	50	.00	.000	
2nd hr	A	50	.00	.000	-
	B	50	.00	.000	
4th hr	A	50	.00	.000	0.0001**
	B	50	.56	.611	
6th hr	A	50	.12	.385	0.0001**
	B	50	2.74	.944	
8thhr	A	50	.30	.544	0.0001**
	B	50	2.88	.824	
12th hr	A	50	2.50	.814	0.0001**
	B	50	4.34	.557	
16th hr	A	50	2.80	.639	0.0001**
	B	50	4.36	.563	
20thhr	A	50	2.86	.808	0.0001**
	B	50	3.42	.538	
24th hr	A	50	2.96	.947	0.134(NS)
	B	50	3.20	.606	

*Statistically significant difference (p < 0.05)
 **Highly significant difference (p < 0.01) NS=Not significant

This table displays the comparison of pain scores between groups A and B at different time intervals using the Visual analogue scale.

From baseline to 2 hours (VAS 0min to VAS 2nd hr), no pain was reported in either group, as indicated by the zero scores and no statistical significance.

From 4 hours to 20 hours the VAS scores between the two groups showed a significant difference with p

value 0.0001 ,showing less VAS scores in group A compared to group B.

By 24 hours, the difference between the groups became statistically insignificant (p = 0.134), with group B (VAS = 3.20) reporting slightly higher pain than group A (VAS = 2.96).

Comparison of heart rate between study groups

Table 5: Comparison of heart rate between group A and B at various time intervals

	Group	N	Mean	Std. Deviation	p value
HR 0(Baseline)	A	50	80.06	8.075	0.378(NS)
	B	50	81.68	10.098	
HR 15min	A	50	77.90	6.612	0.623(NS)
	B	50	77.24	6.772	
HR 1hr	A	50	81.72	9.234	0.445(NS)
	B	50	80.44	7.360	
HR 2hr	A	50	80.54	8.746	0.596(NS)
	B	50	79.60	8.903	
HR 4hr	A	50	81.52	8.247	0.22(NS)
	B	50	83.60	8.617	
HR 6hr	A	50	81.94	8.973	0.276(NS)
	B	50	79.96	9.096	
HR 8hr	A	50	81.00	6.581	0.788(NS)
	B	50	81.42	8.857	
HR 12hr	A	50	78.44	7.316	0.412(NS)
	B	50	77.08	9.098	
HR 16hr	A	50	80.86	9.221	0.131(NS)
	B	50	83.50	8.062	
HR 20hr	A	50	79.30	6.964	0.52(NS)
	B	50	80.38	9.547	
HR 24hr	A	50	80.18	9.356	0.833(NS)
	B	50	79.76	10.431	

*Statistically significant difference (p < 0.05)
 **Highly significant difference (p < 0.01) NS=Not significant

Comparison of mean arterial pressure

Table 6: Comparison of mean arterial pressure between group A and B at various time intervals

	Group	N	Mean	Std. Deviation	p value
MAP 0(BASELINE)	A	50	92.8	8.5	0.787(NS)
	B	50	92.3	8.8	
MAP 15MIN	A	50	85.4	9.2	0.709(NS)
	B	50	84.8	4.8	
MAP 1HR	A	50	85.1	11.8	0.481(NS)
	B	50	86.4	5.3	
MAP 2HR	A	50	84.9	7.02	0.654(NS)
	B	50	84.3	5.3	
MAP 4HR	A	50	83.9	8.6	0.054(NS)
	B	50	80.9	6.4	
MAP 6HR	A	50	83.3	10.1	0.307(NS)
	B	50	81.5	7.2	
MAP 8HR	A	50	83.2	8.1	0.745(NS)
	B	50	82.6	8.7	
MAP 12HR	A	50	82.7	7.7	0.319(NS)
	B	50	84.2	7.0	
MAP 16HR	A	50	82.3	1.7	0.254(NS)
	B	50	83.6	7.7	
MAP 20HR	A	50	83.3	7.2	0.401(NS)
	B	50	84.6	8.6	
MAP 24HR	A	50	82.02	6.3	0.452(NS)
	B	50	81.1	5.2	

*Statistically significant difference (p < 0.05)
 **Highly significant difference (p < 0.01) NS=Not significant

The table represents mean arterial pressure measurements at various time intervals for group A and group B. MAP was similar in both the groups up to 24 hours after surgery with the p values not being statistically significant with p value >0.05.

In group A baseline mean SpO₂ was 98.74±.527 and in group B mean baseline SpO₂ was 98.84±0.468. The difference was not statistically significant at baseline and at 15min, 1hr,2hrs,4hrs, 6hrs,8hr,12hrs and 24 hrs. Mean SpO₂ was not below 95% at any time point in both the groups.

Comparison of adverse effects

Table 7: Adverse effects in group A and B (nausea, vomiting, hypotension)

	Group		Total	p value
	A	B		
Nausea	0	0	0	-
Vomiting	0	0	0	-
Hypotension	0	0	0	-

This table highlights the absence of adverse effects such as nausea, vomiting, and hypotension in both group A and group B. There were no cases of adverse effects such as nausea, vomiting, or hypotension reported in either group A or group B.

DISCUSSION

Somatic pain signals derived from the abdominal wall are implicated in acute pain after open hernia surgery. Poor pain control is associated with a variety of unfavorable postoperative effects, such as patient suffering, distress, respiratory problems, delirium, myocardial ischaemia, and prolonged hospital stays.^[1,2]

There are various methods of pain management following hernia repair, such as systemically administered opioids and NSAIDs, patient-controlled analgesia with epidural technique, local wound infiltration, and fascial plane blocks.^[4] We can administer various fascial plane blocks for hernia repair, including transverse abdominis plane block⁽⁶⁾, ilioinguinal iliohypogastric block, erector spinae plane block.

Traditionally, non-steroidal anti-inflammatory drugs are administered, but they can cause complications like altered haemostasis, nephrotoxicity, and bleeding into the gastrointestinal tract. Nausea, vomiting, profound respiratory depression, paralytic ileus, and sedation can occur with opioids.

With epidural analgesia, there are chances of sympathetic blockade, motor blockade, and delayed ambulation. These complications can be avoided or minimised with the administration of fascial plane blocks. Current evidence suggests ultrasound guided fascial plane blocks for inguinal hernia surgeries to augment patient satisfaction and extend post operative analgesia.

The evolving landscape of ultrasound-guided regional anaesthesia has elevated the ilioinguinal-iliohypogastric nerve block as a highly effective and preferred fascial plane block for reducing risks and improve patient satisfaction.^[7,11,12] The precise placement of local anaesthetics inside fascial layers or in close proximity to the nerves supplying the inguinal region allow for targeted pain relief during and after surgery.

Current preference is for the safer, long-acting local anaesthetic Ropivacaine,^[8] which allows for early ambulation due to its sensory-motor differentiation. Local anaesthetics with adjuvants have caught the attention of both anaesthesiologists and surgeons because they can extend the effects of single-shot nerve blocks and provide long-lasting pain relief after surgery. Among the local anaesthesia adjuvants, Dexamethasone has demonstrated its ability to extend the duration of peripheral nerve blocks when combined with local anaesthetics.

Magnesium Sulphate has now emerged as a ubiquitous drug that was initially confined to the practice of obstetrics, can also attenuate or even prevent central sensitization after peripheral tissue injury or inflammation because it inhibits dorsal horn NMDA receptors

In a retrospective study by Mainprize et al,^[13] they reviewed the charts of adult patients who had undergone inguinal hernia surgery. They matched 100 adult patients who received II-IHNB alone to those who received local anaesthesia and concluded that intraoperative Fentanyl use was decreased in patients who received II-IHNB compared to the group that received local anaesthesia.

In a study by Kacmazet al,^[14] they compared spinal anaesthesia to II-IHNB (with tumescent anaesthesia) in 70 patients scheduled for open inguinal hernia surgery. They concluded that II-IHNB (with tumescent anaesthesia) was superior to spinal anaesthesia in terms of VAS score, early mobilisation, discharge from hospital, and patient satisfaction.

In a study conducted by Rajendra Kumar Sahoo et al,^[1] they administered ilioinguinal- iliohypogastric nerve block and compared efficacy between Ropivacaine with Dexamethasone (4mg) group and control group (normal saline). They observed that the Ropivacaine with Dexamethasone group had an extended duration of analgesia compared to control group.

In a similar study conducted by Deshpande et al,^[15] they compared efficacy of ilioinguinal- iliohypogastric nerve block with Ropivacaine and Ropivacaine with Dexamethasone (4mg) in adult patients scheduled for open inguinal hernia repair under spinal anaesthesia. They observed that the mean duration of analgesia was longer (14.13±3.46 hours) in the Ropivacaine with Dexamethasone group compared to Ropivacaine group (5.77±2.16hrs).

In all the above studies, addition of Dexamethasone to local anaesthetic significantly extended the duration of analgesia without any major adverse effects.^[14] These results align well with our study. We observed that mean duration of analgesia was higher in Dexamethasone group (compared to Magnesium Sulphate group).

Some studies generally indicate that MgSO₄ can enhance the duration of analgesia in nerve blocks when added to local anaesthetics, though results vary based on the type of local anaesthetic, MgSO₄

dosage, and block location. In our study we added 250mg of Magnesium Sulphate as an adjuvant to Ropivacaine in ultrasound guided ilioinguinal iliohypogastric nerve block.

In a study conducted by Ahmed et al,^[16] they compared the efficacy of ilioinguinal- iliohypogastric nerve block in two groups: Levobupivacaine with Dexamethasone (8mg) and Levobupivacaine with Magnesium Sulphate (100mg). The duration of analgesia was prolonged in Dexamethasone group but the highly significant difference could be due to lower dose of Magnesium sulphate.

The above study indicate that MgSO₄ significantly prolongs the duration of analgesia when added as adjuvant with local anaesthetics. In our study though the total duration of analgesia was prolonged in the Magnesium Sulphate group but it was significantly less than the Dexamethasone group.

On the contrary, in a study by Imani F. et al,^[17] they observed that the addition of Magnesium Sulphate to Ropivacaine, in transversus abdominis plane block after hysterectomy, had no effect on the pain scores and on the amount of rescue analgesic consumption. These observations are contradictory to the findings in most of the studies using MgSO₄ as adjuvant to local anaesthetics. Further studies with varying doses of MgSO₄ as adjuvants to local anaesthetics in ilioinguinal- iliohypogastric nerve block are warranted.

These studies support our findings, where Dexamethasone provided a more prolonged analgesic effect compared to Magnesium Sulphate when used as an adjuvant to Ropivacaine.

VAS Scores: In our study, we compared the effectiveness of Ropivacaine combined with either Dexamethasone or MgSO₄ in group A and group B respectively for postoperative analgesia, measured through visual analogue scale scores at various time intervals over 24 hours. Our observations depicted significant differences in duration of analgesia and intensity of pain between the two groups, especially in the early postoperative period.

Comparison of VAS scores: In our study, both group A and group B had a mean VAS score of 0 at 0 mins, 15 mins, 1 hr and 2 hours postoperatively. In our study, group A maintained significantly lower VAS scores compared to group B at 4, 6, and 8 hours, 16 hours and 20 hours (p = 0.0001 at each interval). At 24 hours, the VAS scores between group A and group B were not significantly different (p = 0.134).

In a study by Deshpande et al,^[15] they observed pain score was highly significant (P<0.001) at 8h, significant (p<0.05) at 6h and 12h in Ropivacaine+ Dexamethasone group in comparison with Ropivacaine group.

In a study by Rajendra Kumar Sahoo et al,^[1] they observed that Ropivacaine+ Dexamethasone group participants had reduced pain scores at rest at all assessment periods. They also demonstrated statistically significant differences in NRS score at 3 hours (P < 0.001) and 6 hours (P = 0.013) post-

operatively compared to normal saline group. Upon comparing NRS scores at movement, the NRS score in Ropivacaine+ Dexamethasone group was significantly reduced ($p < 0.05$) across all the periods (3hours, 6hours, 12hours, and 24 hours) compared to normal saline group.

The findings of our study, supported by comparisons with similar research, indicate that Dexamethasone as an adjuvant to local anaesthetic offers a more sustained analgesic effect in reducing pain scores significantly up to 16 hours. However, both Dexamethasone and MgSO₄ show comparable efficacy in pain management at the 24-hour period.

In clinical practice, choosing Dexamethasone as an adjuvant may be beneficial for patients who require prolonged analgesia in the early postoperative period, potentially reducing the need for additional analgesics and improving overall patient comfort.

Comparison of total number of rescue analgesics:

In our study, we noted that in group A, 70% of patients required 1 dose, 30% required 2 doses, none required 3 doses of rescue analgesia. While in group B, 14% required 1 dose, 84% required 2 doses, 2% of them required 3 doses of rescue analgesia. On intergroup comparison, it was found that the need for rescue analgesia was significantly less in group A.

In a study by Rajendra Kumar Sahoo et al,^[1] the total opioid consumption and need for rescue analgesia in the initial 24hours following surgery were markedly lessened in Ropivacaine+ Dexamethasone group compared to normal saline group.

In study by Jyoti Deshpande et al,^[15] they observed that lesser Tramadol requirement (in mg) (48.90 ± 14.07) versus (87.43 ± 10.331) during postoperative 24 hours for Ropivacaine + Dexamethasone group than Ropivacaine group, respectively. At 8 hours, mean pain score was 4.50 ± 1.796 in Ropivacaine + Dexamethasone group and 2.60 ± 0.675 in Ropivacaine group.

Findings in our study align with the observations of other similar studies concluding that Dexamethasone as a adjuvant to local anaesthetics results in lower rescue analgesic consumption in 24 hours compared to MgSO₄ as adjuvant to local anaesthetic.

Adverse effects: In our study, no adverse effects, such as nausea, vomiting, or hypotension, were observed in either group A or group B. This aligns with findings from Islam M. Ahmed et al,^[16] who reported no statistically significant differences between groups regarding shivering, postoperative nausea, and vomiting. They did, however, note a need for temporary intraoperative haemodynamic support in the Magnesium group, with some patients requiring Atropine or Ephedrine, though these results were not statistically significant.

Shambhavi T et al,^[18] similarly found no significant difference in the incidence of nausea between groups in their study, but reported a notably lower incidence of vomiting in the Dexamethasone group (0%) compared to the Magnesium group (10%) ($P = 0.04$), indicating a beneficial effect of Dexamethasone in reducing vomiting postoperatively.

The absence of side effects in our study supports findings from other research suggesting that Dexamethasone as an adjuvant is generally associated with lower incidence of adverse events, particularly in terms of nausea and vomiting, compared to Magnesium sulphate. This highlights Dexamethasone's potential benefits in reducing postoperative complications without adding significant side effects.

CONCLUSION

We conclude that the duration of analgesia was prolonged with 8 mg of Dexamethasone as an adjuvant to 0.375% Ropivacaine compared to 250 mg of Magnesium Sulphate as an adjuvant to 0.375% Ropivacaine in ultrasound guided ilioinguinal-iliohypogastric nerve block in adult male patients scheduled for elective unilateral open inguinal hernia surgery under spinal anaesthesia. Dexamethasone as an adjuvant to Ropivacaine decreases the need for rescue analgesia in the first 24 hours following surgery compared to Magnesium Sulphate with no adverse effects.

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