

# Bilateral Ilioinguinal Iliohypogastric nerve block with 0.25% bupivacaine vs 0.25% bupivacaine with 50µg dexmedetomidine for postoperative analgesia in lower abdomen surgery

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## Abstract

**Background:** The Ilioinguinal Iliohypogastric block (IIH) is commonly used as a part of the multimodal analgesia for lower abdominal, inguinal surgeries. Ilioinguinal Iliohypogastric nerve block is superior to systemic analgesia for surgeries done under Pfannenstiel incision regarding postoperative pain scores, analgesic consumption, postoperative mobilization, time to discharge readiness and patient satisfaction. **Objectives:** The aim of the study is to compare bilateral ilioinguinal iliohypogastric nerve block with 0.25% bupivacaine vs 0.25% bupivacaine with 50µg of dexmedetomidine for postoperative analgesia in lower abdomen surgery and to study the patient satisfaction in postoperative period. **Study Design:** Randomized controlled double blinded study. **Materials and Methodology:** A sixty American society of Anaesthesiologists category I and II undergoing lower abdomen surgeries with Pfannenstiel incision were studied in the prospective randomized control double blinded study. Group B (n=30) patients received 30 ml of 0.25% Bupivacaine, Group BD (n=30) patients received 30ml of 0.25% Bupivacaine containing Dexmedetomidine (50mcg). The assessment of duration of block was carried out by the principal investigator who was blinded to the drugs administered in the block. Parameters were observed which includes heart rate, blood pressure, VAS score, Sedation score, duration of analgesia any side effects. **Results:** The mean duration of analgesia for Group B was 543.33±47.51 minutes and for Group BD was 1295.33±103.014 minutes. Duration of post operative analgesia was prolonged in Group BD when compared with Group B. The p value was based on an independent sample t test which gives a value of <0.001. Thus the difference between the two groups is statistically significant. VAS score between the two groups, Group B and BD at regular intervals from 60 mins to 24 hours is statistically significant (P value < 0.05). No adverse effects noted. **Conclusion:** This study demonstrates that 50µg of dexmedetomidine added as an adjuvant to 0.25% of bupivacaine in ilioinguinal iliohypogastric nerve block has improved postoperative analgesia in lower abdomen surgeries without producing any adverse events.

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## INTRODUCTION

More than 80% patients who undergo surgical procedures experience acute postoperative pain and evidence suggest that less than half of patients who undergo surgery report adequate postoperative pain relief<sup>1,4</sup>. Inadequately controlled pain negatively affects quality of life, function and functional recovery the risk of postsurgical complication the risk of persistent postsurgical pain and delayed recovery time<sup>1,2,4</sup>. Prolonged duration of opioid use higher health care cost, in addition the presence

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intensity of acute pain during or after surgery is predictive of the development of chronic pain<sup>1,4</sup>. Postoperative pain relief reduces surgical stress responses such as endocrine, metabolic and inflammatory. Only regional technique may lead to substantial reduction in surgical stress response<sup>1</sup>. Intense nociceptive somatic and visceral post surgical pain in the last 10 years has been considered the most important development of endocrine and neurohumoral disorders in the immediate postsurgical period<sup>1,5</sup>. It is characterized by increase catabolism, increased secretion of stress hormones, increased burdening of the CVS system, lung function disorders, occurrence of hypercoagulability, fibrinolysis decline immunological suppression, paralytic ileus post surgical nausea and vomiting<sup>1,4,5,9</sup>. Both opioids and non opioids have been used as an adjuvants in postoperative analgesia

### MATERIALS AND METHOD

The clinical study was conducted in the department of anesthesiology at Rajah Muthiah Medical College Hospital, Annamalai University from December 2018 to september 2020. The study was approved by Hospital ethical committee. Written informed consent was obtained from all the patients. The study includes 60 adults patients posted for elective and emergency lower abdomen surgery with Pfannestial incision.

**INCLUSION CRITERIA:** Age 20-60years, ASA I and II, elective and emergency surgery.

**EXCLUSION CRITERIA:** Patient refusal, history of epilepsy, allergic to local anesthetics, Coagulation abnormalities and local infection

**Methods of study:** In all patients selected for the study a detailed general physical examination including airway assessment, spine and systemic examination was done to confirm the previously mentioned inclusion and exclusion criteria. Blood investigation like Complete blood count, bleeding time clotting time, blood grouping and Rh typing, HIV I-II, HbsAg, blood sugar, BUN serum creatinine and ECG. Patients were advised to remain nil per oral after midnight and an IV access was secured using 18G IV cannula and RL was allowed to flow. Emergency drug equipments were kept ready to manage failure or complications. Basal vital parameters like PR, BP, ECG, respiration rate and oxygen saturation were recorded. Patient was positioned in left lateral

position and under all aseptic precaution the back was painted with 2% povidone iodine solution. L3 -L4 space was palpated was infiltrated with 1% Lignocaine. 23G spinal needle was introduced and free flow of CSF was confirmed, 2cc of 0.5% Bupivacaine(heavy) was given for LSCS 3cc for non obstetric surgery was administered intrathecally. Level of blockade was confirmed and surgeon was asked to proceed with the surgery. Intraoperatively patient vitals were monitored. Patients were randomly assigned by the use of computer generated random numbers in to one of the two treatment groups: Ilioinguinal Iliohypogastric nerve block with plain bupivacaine 0.25% (Group B), 0.25% Bupivacaine with 50µg of Dexmedetomidine (Group BD). An anaesthetist not participating in the study opened the randomization envelope and prepared the study drug solution. The preparation of the study drug was done separate from the area where the nerve blockade was performed to ensure a complete blinding procedure. Group 'B' patients received 30 ml of 0.25% Bupivacaine, Group 'BD' patients received 30ml of 0.25% Bupivacaine containing Dexmedetomidine (50µg) was prepared and subsequently marked with the patients study number and nerve block was performed. The final drug injected was thus either 0.25% of Bupivacaine or 0.25% of bupivacaine with 50µg of Dexmedetomidine. The anaesthetist performing the block were not involved in the performance of the study and were blinded to which group the patient belonged.

### PROCEDURE:

At the end of the surgery bilateral Ilioinguinal Iliohypogastric nerve block was administered by landmark guided technique. Under aseptic precautions, the anterior superior iliac spine was palpated on both sides. A point 2cm breadth medially and inferior was marked. A 20G needle was inserted perpendicular to the skin till it encounter with the bone (iliac Crest) after which the needle was withdrawn for 2-3mm checked for negative aspiration. Following it 15ml of the study drug was injected bilaterally. Throughout the procedure patients vitals were monitored. Using VAS SCORE rescue analgesia was given when the VAS SCORE is more than 4. Patient was observed post operatively till patient requires rescue analgesia.

### OBSERVATION AND RESULT

TABLE 1:AGE,HEIGHT,WEIGHT

Parameters	Group B n=30	Group BD n=30
Age (years)	18-70(30.07±8.2)	18-70(34.17±13.23)
Height (cms)	150-180(159.63±4.33)	150-180(158.87±3.31)
Weight (kgs)	45-80(64.28±8.58)	45-80(66.00±6.06)

The age distributions between the two groups were depicted in the above table. More number of patients belonged to the age group of 26 to 35 years. The p value between the two groups were >0.05 and hence both the groups were comparable. The mean value of height in group B was 159.63±4.33 cms that of group BD was 158.87±3.31 cms. The p value between the two groups were >0.05 and hence both the groups were comparable. The mean value of weight in the patients of group B were 64.28±8.58 that of group BD were 66.00±6.06. The p value between the two groups were >0.05 and hence both the groups were comparable.



Figure 1

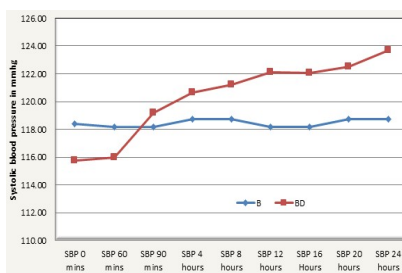


Figure 2

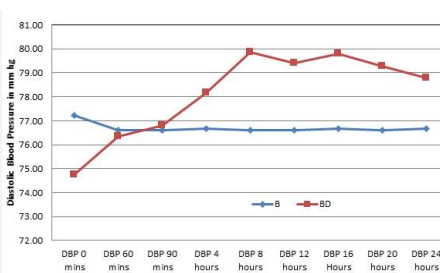


Figure 3

Figure 1: Mean Heart rate between B & BD groups; Figure 2: Mean systolic blood pressure between B & BD groups; Figure 3: Mean Diastolic Blood Pressure between B & BD groups

Heart rate variation between the groups, group B group BD, at regular intervals from 0 mins to 24 hours ,is not statistically significant (p > 0.05) as shown in (Figure 1), systolic Blood Pressure variation between the groups, group B and group BD, at regular intervals from 12 to 24 hours, is statistically significant ( p <0.05) as shown in(Figure 2). Diastolic Blood Pressure variation between the groups, group B and group BD, at regular intervals from 0 to 24 hours , is not statistically significant (p > 0.05) except 8 hours and 16 hours which is statistically significant (p <0.05) as shown in (Figure 3).

**Table 2: Type of surgery**

Surgery details	B	BD	Total	p value
LSCS	24 (80.0)	19 (63.3)	43 (71.7)	0.069
Oophorectomy	02 (6.7)	01 (3.3)	03 (5.0)	
Ovarian cystectomy	01 (3.3)	00	01 (1.7)	
TAH with BSO	03 (10.0)	10 (33.3)	13(21.7)	
<b>Total</b>	<b>30</b>	<b>30</b>	<b>60</b>	

Note values in parenthesis are percentages, p value based on Fisher exact probability test The type of surgery between the two groups were depicted in the above table. More number of patients belong to LSCS category. P value was based on Fisher exact probability test the value is <0.05 hence both the groups are comparable.

**Table 3: Mean Duration of Analgesia**

Group	N	Mean± SD	p value
<b>B</b>	30	543.33± 47.51	0.001
<b>BD</b>	30	1295.33±103.014	

Note: p value based on Independent-samples T test. As seen in table, the mean Duration of Analgesia for Group B was 543.33±47.51 minutes and for Group BD was 1295.33± 103.014 minutes. Duration of post operative analgesia was prolonged in Group BD when compared with Group B .The p value was based on independent sample t test which gives a value of <0.001. Thus the difference between the two groups is statistically highly significant.

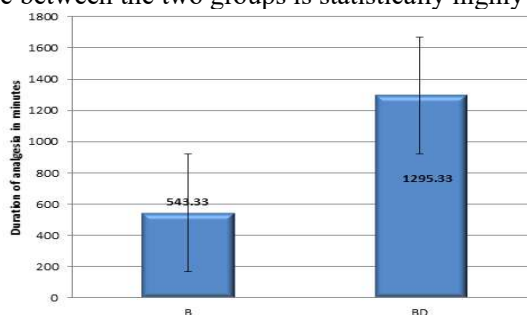


Figure 4: Mean Duration of analgesia

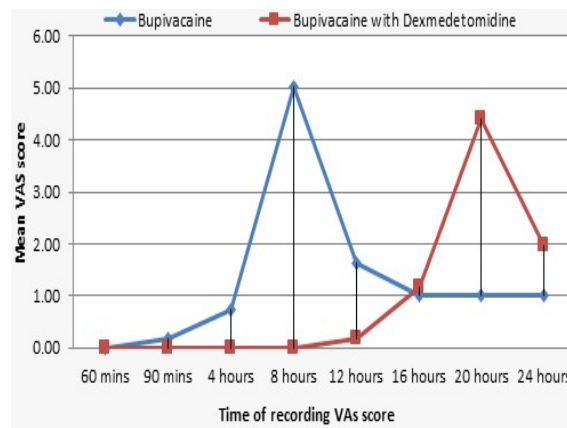
**Table 4: VAS Score**

VAS score	Group B		Group BD		p value
	N	Mean±SD	N	Mean±SD	
60mins	30	0.00± 00 <sup>a</sup>	30	0.0±00 <sup>a</sup>	-
90mins	30	0.17±038	30	0.00±0.00	0.023
4 hour	30	0.73±0.52	30	0.00±0.00	0.001
8 hour	30	5.03±1.30	30	0.00±0.00	0.001
12 hour	30	1.63±1.67	30	0.17±0.38	0.001
16 hour	30	1.00±0.00	30	1.17±1.37	0.509
20 hour	30	1.00±0.00	30	4.40±2.13	0.001
24 hour	30	1.00±0.00	30	1.97±1.97	0.012

<sup>a</sup> cannot be computed because the standard deviations of both groups are 0

Note: p value based on Independent-samples T test.

VAS score between the two groups group B and BD at regular intervals from 60 mins to 24 hours is depicted in above table is statistically significant P value < 0.05



**Figure 5: VAS score among study participants**

**Table 5: Sedation Score**

Sedation score	Group B		Group BD	
	N	Mean±SD	N	Mean±SD
60mins	30	2.0 ± 00 <sup>a</sup>	30	2.0 ± 00 <sup>a</sup>
90mins	30	2.0 ± 00 <sup>a</sup>	30	2.0 ± 00 <sup>a</sup>
4 hour	30	2.0 ± 00 <sup>a</sup>	30	2.0 ± 00 <sup>a</sup>
8 hour	30	2.0 ± 00 <sup>a</sup>	30	2.0 ± 00 <sup>a</sup>
12 hour	30	2.0 ± 00 <sup>a</sup>	30	2.0 ± 00 <sup>a</sup>
16 hour	30	2.0 ± 00 <sup>a</sup>	30	2.0 ± 00 <sup>a</sup>
20 hour	30	2.0 ± 00 <sup>a</sup>	30	2.0 ± 00 <sup>a</sup>
24 hour	30	2.0 ± 00 <sup>a</sup>	30	2.0 ± 00 <sup>a</sup>

<sup>a</sup> cannot be computed because the standard deviations of both groups are 0

Sedation score among the participants were studied but cannot be computed as standard deviation of both the group is 0

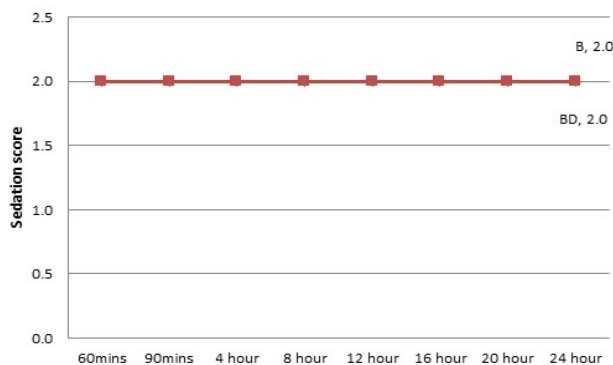


Figure 6: Sedation score between B BD groups

## RESULTS

The mean duration of analgesia for Group B was  $543.33 \pm 47.51$  minutes for Group BD was  $1295.33 \pm 103.014$  minutes. Duration of post operative analgesia was prolonged in Group BD when compared with Group B. The p value was based on independent sample t test which gives a value of  $<0.001$ . Thus the difference between the two groups is statistically highly significant. VAS score between the two groups group B and BD at regular intervals from 60 mins to 24 hours is depicted in above table is statistically significant (P value  $< 0.05$ ). Throughout the study the sedation score was 2 among the participants.

## DISCUSSION

Although general anesthesia continues to be used for most of the surgical procedures, regional anesthesia has been increasing in popularity in recent years. This is mainly because of the fact that the regional anesthesia techniques can be utilized for analgesia not only during the operative period, but during the postoperative period as well and avoids complications of parenteral anaesthesia. A regional technique should always be considered whenever general condition of the patient is poor, or the patient is not adequately prepared or in the presence of associated conditions like uncontrolled diabetes, cardiovascular or respiratory diseases. It is also useful when the patient prefers to retain his consciousness during surgery and when it is important for the patient to remain ambulatory. The alleviation of the suffering is of course a primary concern of the anesthesiologists. Any method of postoperative pain relief must meet three basic criteria; It should be effective, safe and feasible. Currently available local anaesthetics can provide analgesia for limited period of time when used as single injection. To extend the analgesia period beyond the operating rooms, various methods have been tried with the aim of prolonging the local anaesthetic action, like continuous infusion of local anaesthetics via indwelling catheters, use of different additives in local anaesthetics. In our study, dexmedetomidine was used as an adjuvant

in local anaesthetic. Our study was a randomized, prospective, double blinded controlled study. The study includes 60 adults patients coming for elective and emergency lower abdomen surgery with Pfannenstiel incision. The patients were randomly allocated into two groups using standard randomization code. Bilateral ilioinguinal iliohypogastric nerve block was administered. **Group 'B' patients received 30 ml of 0.25% Bupivacaine and Group 'BD' patients received 30 ml of 0.25% Bupivacaine containing dexmedetomidine (50µg)**

The assessment of duration of block was carried out by the principal investigator who was blinded to the drugs administered in the block. Parameters observed included heart rate, blood pressure, VAS score, Sedation score, duration of analgesia any side effects. Dexmedetomidine, the pharmacologically active d-isomer of medetomidine is a highly specific selective  $\alpha_2$  adrenoceptor agonist with  $\alpha_2:\alpha_1$  binding selectivity ratio of 1600:1 as compared to 220:1 for clonidine, thus decreasing the unwanted side effects of  $\alpha_1$  receptors. Presynaptic activation of  $\alpha_2$  adrenoceptor in central nervous system (CNS) inhibits the release of norepinephrine, terminating the propagation of pain signals and their postsynaptic activation inhibits sympathetic activity, thereby decreasing HR and BP. High selectivity for  $\alpha_2A$  receptors mediates analgesia, sedation, anxiolysis. The research done so far shows encouraging results for its use in intravenous sedation (ICU operative patients), spinal, epidural, caudal anaesthesia, Bier's block<sup>32-43</sup>. By virtue of its effects on spinal  $\alpha_2$  receptors, it prolongs analgesia when used with local anaesthetics for neuraxial blocks. The ilioinguinal-iliohypogastric block (IIH) is commonly used as a part of multimodal analgesia for lower abdominal, inguinal surgeries and found that an ilioinguinal Iliohypogastric nerve block is superior to parenteral anesthesia for surgeries under pfannenstiel incision regarding postoperative pain scores, analgesic consumption, postoperative mobilization, time to discharge readiness,

patient satisfaction. Traditionally, the IIIH block has been performed using a landmark technique that relies on anatomical landmarks and subtle tactile sensations of fascial “clicks” or “pops” during the procedure to determine correct block placement. However, disadvantages of using this landmark guided technique include a block failure rate of 10–25% secondary to difficulty in approximating the ilioinguinal and iliohypogastric nerves and increased possibility of major vessel, peritoneal, bowel puncture. IIIH block covers only the pain derived from the Pfannenstiel incision. While the TAP and IIIH block is effective in controlling somatic pain in the anterior abdominal wall related to surgical trauma, it has no effect on the visceral pain relating to peritoneal trauma irritation after surgery. Another disadvantage of the local anesthetic block is their limited duration of action. Clinically statistically the age, weight height of the patients were comparable in both groups. There were no significant differences between the study groups with respect to pattern of changes in heart rate, systolic blood pressure, diastolic blood pressure postoperatively

### Duration of analgesia

**Daisy Karan *et al* (2018)<sup>25</sup>** did a randomized double blind control trial to study the effect of dexmedetomidine as an adjuvant to ropivacaine in Ilioinguinal nerve blocks for inguinal hernia repair in total 60 patients under ultrasound guidance. Thirty patients were randomized to Group R who received 0.2 ml/kg dose of plain ropivacaine in 30 patients and Group RD who received 0.2% of ropivacaine with adjunct dexmedetomidine 1mcg/kg in another 30 patients. The duration of analgesia as studied by the time to the first administration of rescue paracetamol dose was significantly longer in Group RD (970.23 ± 46.71 mins) compared to Group R (419.56 ± 46.71 mins) The percentage of patients needing rescue analgesia within 24 h in Group RD was much less as compared to the other group

**Martin lundbald *et al*(2015)<sup>24</sup>** studied perspective randomized double blind design in children scheduled for outpatient inguinal hernia repair were randomized to receive either an ultrasound guided Ilioinguinal Iliohypogastric nerve block with plain Ropivacaine 0.197% or Ropivacaine 0.197% with adjuvant Dexmedetomidine 0.3mcg/kg. The duration of analgesia as studied by the time to the first administration of rescue Paracetamol dose was significantly longer in Group LAD (16.17 ± 0.77 h) compared to Group LA (6.9 ± 1.01 h) The percentage of patients needing rescue analgesia within 24 hr in Group LAD was much less as compared to the other group

**C A Harrison, S Morris JS Harvey(1994)<sup>28</sup>** compared, in 40 adult males, the effect on pain in the first 24 hr after herniorrhaphy of preincisional Ilioinguinal Iliohypogastric nerve block and wound infiltration with 0.5% Bupivacaine or saline. After operation, patients received morphine IV via a patient controlled analgesia machine and visual analogue pain scores (VAS) at rest and on movement were recorded. The Bupivacaine group consumed less morphine in the first 6 h after operation. There was no difference in morphine consumption between the two groups in the next 18 hr. The time to first analgesia was delayed in the Bupivacaine group and was not followed by a rebound increase in requirement for analgesia.

**Anjali Poudel *et al* (2017)<sup>29</sup>** conducted a study on 60 patients, 30 in each were randomly allocated in to two groups. Group B received bilateral Ilioinguinal Iliohypogastric block nerve block by landmark guided technique with 20ml of 0.5% Bupivacaine; 10 ml in each side Group NS received Ilioinguinal Iliohypogstric nerve block with 20 ml of 0.9% normal saline. The mean effective duration of analgesia measured from the time of onset of spinal blockade to the time of request for Tramadol was 264±78.27 minutes in Group B 178.17±30.61 minutes in Group NS.

**Yonas Addisu *et al* (2016)<sup>30</sup>** conducted study on 80 patients undergoing caesarean delivery via Pfannenstiel incision under spinal anesthesia were randomly allocated to receive either bilateral Ilioinguinal Iliohypogastric nerve block with 16ml of 0.25% bupivacaine per side or Ilioinguinal Iliohypogastric nerve block. The first opioid analgesics request time between the two groups was compared. Time of first opioid analgesia request was shorter in the control group than in Ilioinguinal Iliohypogastric nerve block group

**Sakalli *et al*(2010)<sup>17</sup>** reported that, reduced pain score and amount of PCA tramadol consumption by the Ilioinguinal Iliohypogastric nerve block group during the 24 h following caesarean delivery when performed after wound closure

**LVamsee Kiran *et al*(2017)<sup>26</sup>** conducted a study in 60 patients who underwent LSCS were randomly allocated into two groups to receive either US guided TAP block or Ilioinguinal Iliohypogastric nerve block. All patients in both the study groups required one dose of rescue analgesics in the form of injection diclofenac sodium 50 mg intravenously but subsequently 57% of patients did not require any further analgesics till 24 hrs in the TAP block group whereas in Ilioinguinal Iliohypogastric nerve group, only 13% did not require further analgesics, correspondingly the cumulative tramadol dose was significantly higher at all the time interval in the Ilioinguinal Iliohypogastric group when compared to the

TAP group. Quality of postoperative analgesia provided by TAP block was superior to Ilioinguinal Iliohypogastric block following LSCS

In our study 2020, the mean duration of Analgesia for Group B was 543.33±47.51 minutes for Group BD was 1295.33±103.014 minutes. Duration of post operative analgesia was prolonged in Group BD when compared with Group B .Thus the difference between the two groups is statistically highly significant

#### VAS scores

**Martin lundbald et al(2015)**<sup>24</sup> studied perspective randomized double blind design in children scheduled for outpatient inguinal hernia repair were randomized to receive either an ultrasound guided ilioinguinal iliohypogastric nerve block with plain ropivacaine 0.197% or ropivacaine 0.197% with adjuvant dexmedetomidine 0.3mcg/kg. The primary endpoint of the study was time to first postoperative administration of supplemental analgesia triggered by a pain score  $\geq$  4. The percentage of patients needing no or only one dose of supplemental analgesics during the first 24hr was higher in the dexmedetomidine group as compared to the plain ropivacaine group. Group LA at 6 8 h At 24 h, pain scores were higher in Group LA than in Group LAD

**Daisy Karan et al(2018)**<sup>25</sup> In total, 65 patients were recruited in the study and 60 patients were subsequently enrolled. Thirty patients were randomized to Group R and 30 patients to Group RD .The median pain scores were significantly lower in Group RD compared to Group R at 6 8 h At 24 h, pain scores were higher in Group R than in Group RD.

**C A Harrison, S Morris JS Harvey(1994)**<sup>28</sup> compared, in 40 adult males, the effect on pain in the first 24 h after herniorrhaphy of preincisional ilioinguinal iliohypogastric nerve block wound infiltration with 0.5% bupivacaine or saline. After operation, patients received morphine iv via a patient controlled analgesia machine. visual analogue pain scores (VAS) at rest and on movement were recorded. There was no significant difference in VAS scores at rest but there was a significantly higher pain score with movement in the saline group. We have shown that the combination of nerve block and wound infiltration reduces consumption of morphine in the first 24 hr after herniorrhaphy .We have failed to show any effect of 0.5% bupivacaine beyond the first 6h after operation.

In our study 2020, in postoperative period, the patients were observed for at least 24 hours when complained of VAS scores of  $>$  4 were treated with rescue analgesics. The VAS scores among patients from both the group were comparable during the entire postoperative observation period this attributable to the analgesic actions of both the drugs.VAS score between the two

groups group Band BD at regular intervals from 60 mins to 24 hours is statistically significant P value.

## CONCLUSION

In our study demonstrates that 50 µg of dexmedetomidine added as an adjuvant to 0.25% of bupivacaine for ilioinguinal iliohypogastric nerve block has improved postoperative analgesia in lower abdomen surgeries without producing any adverse events.

## REFERENCE

1. Kehlet H, Jensen T, Woolf C: Persistent postsurgical pain: Risk factors prevention Lancet 367:1618-1625, 2006
2. Gan TJ, Habib AS, Miller TE, White W, Apfelbaum JL: Incidence, patient satisfaction, perceptions of post-surgical pain: Results from a US national survey Curr Med Res Opin 30:149-160, 2014
3. Kehlet H, Holte K Effect of postoperative analgesia on surgical outcome Br J Anaesth 2001;87(1):62-72
4. Chou R, et al. Management of postoperative pain: a clinical practice guideline from the American Pain Society, the American Society of Regional Anesthesia Pain Medicine, the American Society of Anesthesiologists 'Committee on Regional Anesthesia, Executive Committee, Administrative Council J Pain 2016 17 2 131
5. Gudlin J Opioid therapies cytochrome p450 interactions J Pain Symptom Manage 2012 44 6 Suppl S4-S14
6. Kelly DJ, et al. Preemptive analgesia I: physiological pathways pharmacological modalities Can J Anaesth 2001
7. Benglis DM, Vanni S, Levi AD 2009 An anatomical study of the lumbosacral plexus as related to the minimally invasive transpoas approach to the lumbar spine J Neurosurg Spine 10:139-44
8. Moro T, Kikuchi S, Konno S et al. 2003 An anatomic study of the lumbar plexus with respect to retroperitoneal endoscopic surgery Spine (Phila Pa 1976) 28:423-
9. Klaassen Z, Marshall E, Tubbs RS et al. 2011 Anatomy of the ilioinguinal iliohypogastric nerves with observations of their spinal nerve contributions Clin Anat 24:454-61 Together with Ndiaye et al. 2007, these two papers provide a useful description of the anatomy of the ilioinguinal iliohypogastric nerves underline the importance of the ilioinguinal nerve in clinical practice.
10. Bhana N, et al:dexmedetomidine Drugs 59:263, 2000.
11. Ebert TJ, et al: the effects of increasing plasma concentration of dexmedetomidine in humans. Anesthesiology 93:382, 2000.
12. Aantaa R, Kanto J, Scheinin M, et al: dexmedetomidine, an alpha 2 adrenoreceptor agonists, reduces anesthetic requirements for patients undergoing minor gynecologic surgery: Anesthesiology 73:230-235, 1990.
13. Maze M, Angst MS: Dexmedetomidine and opioid interactions: Defining the role of Dexmedetomidine for intensive care unit sedation .Anesthesiology 101:1059-1061, 2004.

14. Koroglu A, et al: A comparison of the sedative hemodynamic and respiratory effects of Dexmedetomidine and propofol in children undergoing magnetic resonance imaging .*AnesthAnalg* 103:63, 2006.
15. Vallejo MC, Steen TL, Cobb BT, Phelps AL, Pomerantz JM, Orebaugh SL, *et al.* Efficacy of the bilateral ilioinguinal-iliohypogastric block with intrathecal morphine for postoperative cesarean delivery analgesia *ScientificWorldJournal* 2012;2012:107316
16. Ganta R, Samra SK, Maddineni VR, Furness G Comparison of the effectiveness of bilateral ilioinguinal nerve block wound infiltration for postoperative analgesia after caesarean section *Br J Anaesth* 1994;72:229-30
17. Sakalli M, Ceyhan A, Uysal HY, Yazici I, Basar H The efficacy of ilioinguinal iliohypogastric nerve block for postoperative pain after caesarean section *J Res Med Sci* 2010;15:6-13
18. Bunting P, McConachie I Ilioinguinal nerve blockade for analgesia after caesarean section *Br J Anaesth* 1988;61:773-5735.
19. Oriola F, Toque Y, Mary A, Gagneur O, Beloucif S, Dupont H Bilateral ilioinguinal nerve block decreases morphine consumption in female patients undergoing nonlaparoscopic gynecologic surgery *AnesthAnalg* 2007;104:731-4
20. Bell EA, Jones BP, Olufolabi AJ, Dexter F, Phillips-Bute B, Greengrass RA, *et al.* Ilioypogastric-ilioinguinal peripheral nerve block for post-caesarean delivery analgesia decreases morphine use but not opioid-related side effects *Can J Anaesth* 2002;49:694-700
21. Minal Harde, Varsha Suryavanshi, Anjana Sabu, Sachin K Wagh comparative study of Ropivacaine bupivacaine in bilateral Ilioinguinal ilioypogastric nerve block for post Caesarean section analgesia *IJCMR* April 2016|Volume 3 | Issue 4;1167-1171
22. MahinSeyedhejazzi, Daryoushsheikhzadeh, Zahira Adrang, FahimeKazemiRashed Comparing the analgesic effect of caudal Ilioinguinal ilioypogastric nerve block using bupivacaine clonidine in inguinal surgeries in children 2-7 years old *Africal Journal of Paediatric Surgery* [2014] Issue 2 | Volume II|Page 166-169
23. Morgan GE, Mikhail MS, Murray MJ Peripheral nerve blocks *Clinical anesthesiology* 4th ed New York: The McGraw Hill Companies; 2006 p 325-9
24. Macrit Lundblad, Daniela Marhofer, Staffan Eksborg Per-Arne Lonnqvist Dexmedetomidine as adjunct to ilioinguinal/ilioypogastric nerve blocks for pediatric inguinal hernia repair: an exploratory romized controlled trial *PaediatrAnaesth* 2015 Sep;25(9):897-905
25. Daisy Karan, Swastika Swaro, Pratik Ranjan, Mahapatra, Anweshab Banerjee Effect of dexmedetomidine as an adjuvant to Ropivacaine in Ilioinguinal ilioypogastric nerve block for inguinal hernia repair in Pediatric patient A Romized Double blind control trial *Anaesthesia : Essay researches | volume 12 | Issue 4 | October - December 2018*
26. LVamsee Kiran, TShivashanmugam, VR Hemanth Kumar, Nkrishnaveni, SParthasarthy Relative efficacy of Ultrasound guided Ilioinguinal-Ilioypogastric nerve block vs TAP block for postoperative analgesia following LSCS A prospective, Romized observe blinded trial *Anaesthesia: Essay Researches | Volume 11 | Issue 3 | July-September*
27. Abdurrahman Demirci, Esra Mercanoglu Efe\*, Gürkan Türker, Alp Gurbet, Fatma Nur Kaya, Ali Anil, Ilker Cimen *Revista Brasileira de Anestesiologia* Vol 64 | no5| Sept-Oct 2014
28. CA Harrison, S Morris JS Harvey Effect of ilioinguinal ilioypogastric nerve block wound infiltration with 05% bupivacaine on postoperative pain after hernia repair *British Journal of Anaesthesia* 1994; 72: 691-693
29. Poudel, A, Dutta, P (2018) A comparative study of bilateral ilioinguinal ilioypogastric nerve block for postoperative analgesia in lower segment cesarean section *Journal of Society of Anesthesiologists of Nepal*, 4(2), 81-86
30. Yonas Addisu Nigatu, Endale Gebreegziabher, Gebremedhn, Hailu Yimer Tawuye Amare Hailekiros Gebreegzi Analgesic efficacy of bilateral Ilioinguinal ilioypogastric nerve block for post caesarean delivery under spinal anaesthesia *Double blind Romized study Journal of Anaesthesia Clinical Research| Volume 8 | Issue 8*
31. Kamibayashi T, Maze M Clinical uses of alpha2-adrenergic agonists *Anesthesiology* 2000;93:1345-1349
32. Oda Y, Toriyama S, Tanaka K, *et al.* The effect of dexmedetomidine on electrocorticography in patients with temporal lobe epilepsy under sevoflurane anesthesia *AnesthAnalg* 2007;105(5):1272-1277
33. Rozet I, Metzner J, Brown M, *et al.* Dexmedetomidine does not affect evoked potentials during spine surgery *AnesthAnalg* 2015;121(2):492501
34. Friesen RH, Nichols CS, Twite MD, *et al.* The hemodynamic response to dexmedetomidine loading dose in children with without pulmonary hypertension *AnesthAnalg* 2013;117(4): 953-959
35. Ice CJ, Personett HA, Frazee EN, *et al.* Risk factors for dexmedetomidine associated hemodynamic instability in noncardiac intensive care unit patients *AnesthAnalg* 2016;122(2):462-469
36. Talke P, Chen R, Thomas B, *et al.* The hemodynamic adrenergic effects of perioperative dexmedetomidine infusion after vascular surgery *Anesth Analg* 2000;90(4):834-839
37. Li Y, Wang B, Zhang LL, *et al.* Dexmedetomidine combined with general anesthesia provides similar intraoperative stress response reduction when compared with a combined general epidural anesthetic technique *AnesthAnalg* 2016;122(4):1202-1210
38. Lodenius Å, Ebberyd A, Hårdemark Cedborg A, *et al.* Sedation with dexmedetomidine or propofol impairs hypoxic control of breathing in healthy male volunteers: a nonblinded, romized crossover study *Anesthesiology* 2016;125(4): 700-715
39. Chen K, Lu Z, Xin YC, *et al.* Alpha-2 agonists for long-term sedation during mechanical ventilation in critically ill patients *Cochrane Database Syst Rev* 2015;(1):CD010269



40. Alexopoulou C, Kondili E, Diamantaki E, *et al.* Effects of dexmedetomidine on sleep quality in critically ill patients: a pilot study *Anesthesiology* 2014;121(4):801–807
41. He XY, Cao JP, He Q, Shi XY Dexmedetomidine for the management of awake fiberoptic 2014;(1):CD009798 intubation *Cochrane Database Syst Rev*
42. Ronald D Miller, MD, MS: *Basics of ANESTHESIA*, 7th edn Elsevier, 2018
43. Rachana Ghi Alka Shah, Ila Pate Use Of Dexmedetomidine Along With Bupivacaine For Brachial Plexus Block: *National Journal Of Medical Research* Volume 2 Issue 1 Jan – March 2012 30

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