



Anaesthesiology

COMPARISON OF ANALGESIC EFFICACY OF EXTERNAL OBLIQUE INTERCOSTAL BLOCK WITH ERECTOR SPINAE PLANE BLOCK FOR PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY SURGERY: IS THERE A NEED TO GO DEEP?- A PILOT STUDY

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ABSTRACT **Introduction:** External oblique intercostal block (EOI) is a nascent fascial plane block recommended for upper abdominal surgery. There are very few studies comparing its analgesic efficacy. We compare the analgesic efficacy of this new block with erector spinae plane block (ESP) in patients undergoing laparoscopic cholecystectomy. **Methods:** A total of 30 patients undergoing laparoscopic cholecystectomy were considered for this prospective, randomized, single-blinded pilot study. Patients were divided randomly into two groups, group I (EOI block, n=15) & group II (ESP block, n=15). After administration of general anaesthesia, ultrasound guided blocks were given bilaterally using inj. 0.125% bupivacaine 50ml with inj. dexamethasone 4mg (25ml/side), high frequency linear transducer and 23G spinal needle. In Group I, block was performed at level of 6th rib between anterior-axillary and mid-clavicular line using in-plane approach. In Group II, block was administered at level of 8th rib using in-plane approach. Inj. fentanyl 0.5mcg/kg i.v. was administered as a rescue analgesic for intra-operative increase in HR & BP >25% from baseline and post-operative visual analogue scale score (VAS) > 4. Post-operative VAS scores for first 24 hours, intra-operative and post-operative rescue analgesics requirement, time to perform block and complications were compared between two groups. **Results:** There was no significant difference in post-operative first 24 hours VAS scores (p=0.740, independent t test). Time to perform block was significantly different between two groups (Group I-12.8 +/- 1.64 mins vs Group II- 19.8 +/- 1.48 mins, p<0.001, independent t test). No intra-operative and post-operative rescue analgesic requirements and no complications occurred in both the groups. **Conclusion:** EOI block provides similar analgesia but is faster to perform as compared to ESP block in patients undergoing laparoscopic cholecystectomy. There is no need to go deep in such cases.

KEYWORDS : External oblique intercostal block, Erector spinae plane block, Laparoscopic cholecystectomy.

INTRODUCTION

There are various fascial plane blocks described for post-operative analgesia following laparoscopic cholecystectomy surgery. EOI block is a nascent fascial plane block recommended to provide post-operative analgesia following upper abdominal surgery. There are very few studies comparing its analgesic efficacy with other fascial plane blocks. So, we conduct this study.

Aims of the Study

- 1) To compare post-operative first 24hrs VAS scores between two groups.
- 2) To compare intra-operative and post-operative rescue analgesic requirements (fentanyl 0.5mcg/kg) between two groups.
- 3) To compare time required to perform the block and block complications between two groups

METHODOLOGY

After Institutional Ethical Committee (IEC) approval [IEC/ Pharm/ RP/115/Feb/2023] this prospective, randomised, single blind pilot study was conducted at a tertiary care hospital over a period of 3 months in the year 2023. Total of 30 patients were considered for this pilot study.

Inclusion Criteria: Patients aged 18 to 60yrs, American Society of Anaesthesiologists (ASA) grade I & II undergoing elective laparoscopic cholecystectomy surgery were included in this study

Exclusion Criteria: Patients allergic to local anaesthetic, having infection at site of injection, BMI > 25kg/m² were excluded in this study.

Patients underwent pre-anaesthetic evaluation on the day prior to scheduled surgery as per our institutional protocol. A well informed written consent was obtained from each eligible patient undergoing the study. On the day of surgery, patients were randomly divided into two groups viz. Group I (EOI block, n=15) & Group II (ESP block, n=15) using computer generated random number tables.

Standard monitors like NIBP, ECG and SpO₂ were attached and

baseline vitals viz Heart Rate (HR), Blood pressure (BP) and saturation were noted.

General anaesthesia was administered using inj. glycopyrrolate 0.2mg, inj. ondansetron 4mg, inj. midazolam 1mg, inj. fentanyl 100mcg, inj. propofol 1-2mg/kg and inj. vecuronium 80mcg/kg i.v. and patients were intubated using conventional laryngoscopes and appropriate size endotracheal tube. Maintenance of anaesthesia was done using 50%-50% mixture of oxygen and air with sevoflurane at MAC 1%. After administration of general anaesthesia, ultrasound guided fascial plane blocks were given bilaterally using high frequency linear probe 6-13 MHz [Sonosite Edge II, Fujifilm, Tokyo, Japan] and 23G Quincke's spinal needle. A total of 50ml of inj. 0.125% bupivacaine with inj. dexamethasone 4mg was drug administered for bilateral blocks in both groups. 25ml of drug was administered per side. Blocks were administered by the experienced anaesthesiologist.

In Group I, patients received bilateral EOI block at the level of 6th rib between anterior-axillary line and mid-clavicular line using in-plane approach in supine position. (Figure 1)

In Group II, patients received bilateral ESP block at the level of 8th rib (T8 level) using in-plane approach in lateral position. (Figure 1)

Vitals viz HR, BP and saturation were recorded post blocks every 15mins by anaesthesiologist blinded to the study.

Intra-operatively patients received inj. paracetamol 1gm and inj. ketorolac 30mg i.v. as a part of multi-modal analgesia. Post-operatively inj. paracetamol 1gm 6hourly and inj. ketorolac 30mg 12hourly was administered i.v. as a part of multi-modal analgesia. Inj. fentanyl 0.5mcg/kg i.v. was used as rescue analgesic if intra-operatively there was > 25% increase in HR and BP from baseline and post-operatively if VAS score > 4.

At the end of surgery all patients were extubated and shifted to wards where VAS scores were assessed every 4hourly for first 12hours and every 6hourly for next 12hours post-operatively.

Time required to perform the block (starting from probe placement till completion of injection of drug), intra-operative and post-operative rescue analgesic requirements, post-operative first 24 hours VAS scores and block complications were compared between the two groups.

The observed data was expressed as mean $\pm$ standard deviation for normally distributed data and median (interquartile range) for nonparametric data. Appropriate statistical tests were applied to the data. Statistical analysis was done using SPSS software version 22 released in 2013 [IBM Inc., Armonk, NY]. A p value of < 0.05 was considered as statistically significant.

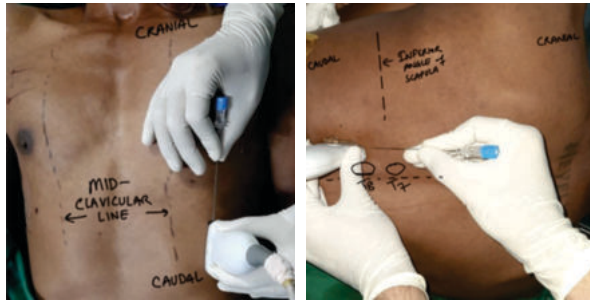


Figure 1: Administration Of EOI Block (Top Image); ESP Block (Bottom Image)

RESULTS

Demographic characteristics like age, gender, BMI, ASA grade were comparable between two groups.

There was no significant difference in post-operative first 24 hours VAS scores between two groups as shown in Table no. 1 (independent t test). Time required to perform block differed significantly between two groups. In Group I, it was 12.8 ± 1.64 mins whereas in Group II, it was 19.8 ± 1.48 mins with $p < 0.001$ (independent t test). No intra-operative and post-operative rescue analgesia was required in both groups and no complications occurred in both groups. [Figure 2]

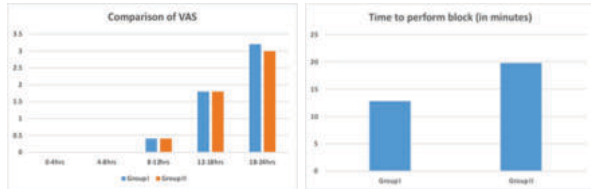


Figure 2: Post-operative VAS Scores (Top Image) And Time To Perform Block (Bottom Image) Between Two Groups

Table No. 1: Comparison Of VAS Scores Between Two Groups

Time interval (hrs)	Group I (Mean $\pm$ SD)	Group II (Mean $\pm$ SD)	p value
0-4 hours	0 $\pm$ 0	0 $\pm$ 0	-
4-8 hours	0 $\pm$ 0	0 $\pm$ 0	-
8-12 hours	0.40 $\pm$ 0.55	0.40 $\pm$ 0.55	1.000
12-18 hours	1.8 $\pm$ 0.45	1.8 $\pm$ 0.45	1.000
18-24 hours	3.2 $\pm$ 0.84	3 $\pm$ 1	0.740

DISCUSSION

ESP block was first described by Forero et al in the year 2016 for thoracic neuropathic pain, since then it has been used for various indications including abdominal surgeries.^[1] EOI block was first described by Hamilton et al in the year 2018 for upper abdominal wall analgesia since then there are very few studies demonstrating and comparing its analgesic efficacy.^[2] Those studies are limited to case series and case reports. Liotri et al in 2023 in their case series of 3 patients undergoing liver surgeries administered bilateral EOI block using 0.375% ropivacaine 20ml with 75mcg clonidine and found reduced post-operative pain scores and opioid requirements.^[3] Elsharkawy et al in 2021 in their case series of 22 patients undergoing upper abdominal surgeries administered bilateral EOI block using 0.25% bupivacaine 15ml and found EOI block provided effective analgesia.^[4] White et al in 2022 in their case series of 2 obese patients undergoing upper abdominal surgeries administered bilateral EOI block using 0.2% ropivacaine 20ml and found EOI provided effective analgesia.^[5] We in our pilot study also observed decreased post-operative pain scores and reduced opioid analgesic requirements in

both the groups. None of these studies commented on time to perform block and we found reduced time to perform the block in EOI group as compared to ESP group. Adequate sample size for our study was not taken as there were no randomized control trials in the past during the inception of this study. However using data from our pilot study adequately sized randomized control trial can be conducted in the future.

CONCLUSION

Bilateral EOI block provides similar analgesia but is faster to administer as compared to bilateral ESP block in patients undergoing laparoscopic cholecystectomy surgery. There is no need to go deep to provide analgesia in such cases. However large randomized control trials are required to confirm these results.

Limitations Of Our Study

Due to small sample-size the power of this pilot study was inadequate.

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