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"COMPARISON OF ANALGESIC EFFICACY OF BILATERAL EXTERNAL OBLIQUE INTERCOSTAL BLOCK WITH RIGHT SIDE EXTERNAL OBLIQUE INTERCOSTAL & LEFT SIDE RECTUS SHEATH BLOCK IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY SURGERY- A PILOT STUDY "

Anaesthesiology

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ABSTRACT

Introduction: Upper abdominal wall is innervated by anterior and lateral cutaneous branches of thoraco-abdominal nerves T6-T10 but it's midline has got bilateral innervations from anterior cutaneous nerves. As a result bilateral fascial plane blocks are given for upper abdominal surgeries. External oblique intercostal block (EOI) is a new fascial plane block recommended for upper abdominal surgery. We compare the analgesic efficacy of bilateral EOI block with right side EOI & left side rectus sheath block (RSB) in patients undergoing laparoscopic cholecystectomy. **Methods:** A total of 30 patients undergoing laparoscopic cholecystectomy were considered for this prospective, randomized, single-blind pilot study. Patients were divided randomly into two groups, group EE(n=15, bilateral EOI block) and group ER(n=15, right side EOI block and left side RSB block). After administration of general anaesthesia, ultrasound guided blocks were given using high frequency linear transducer, 23G spinal needle and inj. 0.125% bupivacaine 50ml with inj. dexamethasone 4mg (25ml/block). Inj. fentanyl 0.5mcg/kg i.v. was rescue analgesic if intra-operatively HR & BP increased > 25% from baseline and post-operatively if visual analogue scale score (VAS) > 4 . Intra-operative and post-operative rescue analgesic requirements, post-operative first 24hrs VAS scores, time required to perform block and complications were compared between two groups. **Results:** There was no significant difference in post-operative first 24 hour VAS scores (p-0.545, independent t test). Time to perform block differed significantly between two groups (Group EE- 16.8 +/- 1.3 mins vs Group ER- 12.8 +/- 1.64 mins, p=0.003, independent t test). No intra-operative and post-operative rescue analgesic was required and no complications occurred in both the groups. **Conclusion:** Bilateral EOI block provides similar analgesia but takes more time to perform when compared with right side EOI & left side RSB block in patients undergoing laparoscopic cholecystectomy.

KEYWORDS

External oblique intercostal block, Rectus sheath block, Laparoscopic cholecystectomy.

INTRODUCTION

Upper abdominal wall is innervated by anterior and lateral cutaneous branches of thoraco-abdominal nerves T6-T10. But it's midline has got bilateral innervations from anterior cutaneous nerves. As a result bilateral fascial plane blocks are given for post-operative analgesia following upper abdominal surgeries. External oblique intercostal (EOI) block, the newer block is recommended for upper abdominal surgeries and there are very few studies comparing its analgesic efficacy in combination with other 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/150/Mar/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. A well informed written consent was obtained from each patients undergoing the study.

Inclusion Criteria: Patients aged 18 to 60yrs, 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/m^2 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 EE (Bilateral EOI block, n=15) & Group ER (Right side EOI block and left side RSB 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 patient 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 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 in both groups. 25ml of drug was administered per block. Blocks were administered by the experienced anaesthesiologist.

In Group EE, 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 ER, patients received right side EOI block same as group EE, whereas left side RSB block was administered at umbilicus level on left side in supine position using in-plane approach. (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 i.v. was administered 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 +/- 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); RSB 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 with p- 0.545 (independent t test). Time to perform block differed significantly between two groups. In Group EE it was 16.8 +/- 1.3 mins whereas in Group ER it was 12.8 +/- 1.64 mins with p=0.003 (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]

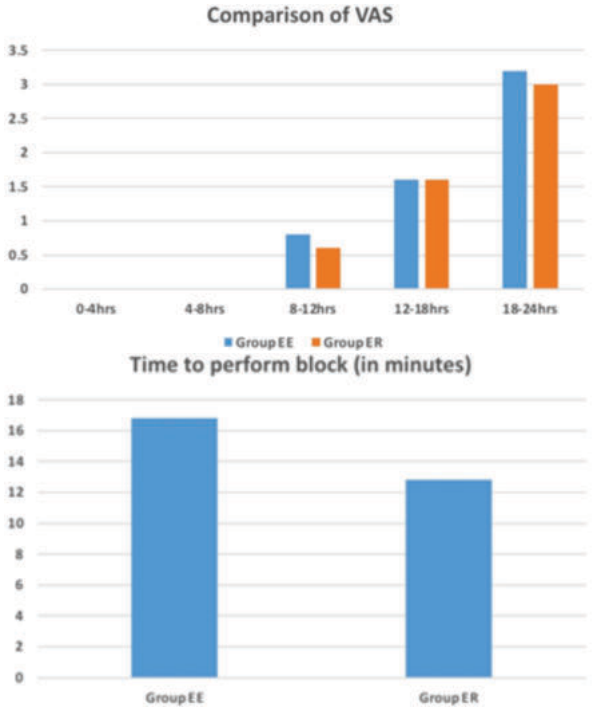

Figure 2: Post-operative VAS scores (top image) and time to perform block (bottom image) between two groups

DISCUSSION

EOI block was first described by Hamilton et al[1] in the year 2018 for upper abdominal wall analgesia since then there are very few studies demonstrating and comparing its analgesic efficacy either alone or in combination with other blocks. Those studies are limited to the case series and case reports. Cosarcan et al[2] in 2021 in their case series of 3 patients undergoing liver surgeries administered bilateral EOI block using 0.25% bupivacaine 20ml and found reduced post-operative pain scores and opioid requirements. Elsharkawy et al[3] 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. White et al [4] 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. 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 right EOI block and left RSB block group as compared to bilateral EOI 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 takes more time to perform when compared to right side EOI block with left side RSB block in patients undergoing laparoscopic cholecystectomy surgery. 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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