COMPARISON OF EFFICACY OF ILIOINGUINAL / ILIOHYPOGASTRIC NERVE BLOCK AND TRANSVERSUS ABDOMINIS PLANE BLOCK FOR POSTOPERATIVE PAIN MANAGEMENT IN PATIENTS UNDERGOING OPEN INGUINAL HERNIA REPAIR: A RETROSPECTIVE COHORT STUDY

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ABSTRACT

BACKGROUND

Postoperative pain in inguinal hernia repair is moderate to severe and is associated with chronic postoperative pain. Ilioinguinal, Iliohypogastric (IIN/IHN) block or Transversus Abdominis Plane (TAP) Block can be used to treat this pain. Recent evidences suggested that ultrasound-guided IIIH block is more effective than TAP block. This retrospective study compared the postoperative analgesia among the ultrasound-guided IIN/IHN block and USG guided TAP block for inguinal hernia repair surgery in adults. We wanted to compare mean duration of requirement of rescue analgesia and postoperative pain scores in patients receiving USG guided Tap block vs ilioinguinal/iliohypogastric block.

METHODS

All charts of men 18 years above and up to 60 years, with ASA grade of 1-3, who underwent elective inguinal hernia surgeries under spinal anaesthesia, where included in the study. 60 patients were identified and assigned into two group. Group 1 Patients received TAP block and the group 2 Patients received the ilioinguinal and iliohypogastric nerve block. All cases received subarachnoid block with 0.5% bupivacaine without any adjuvants as the primary mode of anaesthesia. Perioperative data of the subjected patients were collected retrospectively including age, height, weight, ASA classification, hemodynamic parameters, VAS pain scores and the time for rescue analgesia.

RESULTS

The mean duration (in minutes) to require rescue analgesia was found to be 320.6 ± 114.2 (min) in group 1 and 410 ± 116.24 (min) in group 2. On comparison of these two values the difference in mean time to rescue analgesic requirement was statistically significant ($p<0.005$).

CONCLUSIONS

Following inguinal hernia repair surgery, IIN/IHN block provides more effective postoperative analgesia than TAP block.

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BACKGROUND

Open inguinal hernia repair is a commonly performed procedure[1] which is associated with substantial postoperative pain.[2] Inguinal hernia repair usually performed under spinal anaesthesia in adults. The incidence of postoperative pain after inguinal hernia repair varies from 0-37%.[3] Acute postoperative pain reduces the patient quality of life greatly and results in chronic persistent pain.[3] This leads to the necessity of multimodal approach of postoperative pain management.

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Various methods like non -steroidal anti -inflammatory agents (NSAIDS), paracetamol, local infiltration, nerve blocks were used as a part of multimodal analgesia for the management of the postoperative pain. The use of regional anaesthesia techniques is associated with shorter hospital stay, less morbidity and are also cost effective.[4]

Transversus abdominis plane (TAP) block and ilioinguinal (IIN) nerve blocks and iliohypogastric (IHN) nerve blocks has been used to alleviate pain due to abdominal wall incision.[1,5]

The use of point of care ultrasound helps in real time assessment of nerve blocks improves the success rate and may potentially reduce the incidence of complication.

The comparative efficacy of the TAP and IIN/IIH blocks for postoperative pain in inguinal hernia repair surgeries was found to be conflicting.

Since there are no conclusive studies favouring either of the two afore mentioned techniques, this retrospective cohort study was conducted to compare the ultrasound

guided tap block and IIN/IHN block for their postoperative analgesic efficacy in adult patients undergoing hernia surgeries.

METHODS

Following institutional review board approval, this retrospective cohort was conducted in Dr. Somervell Memorial C.S.I Medical college hospital. All charts of men 18 years above and up to 60 years, with ASA grade of 1-3, who underwent elective inguinal hernia surgeries under spinal anaesthesia between Jan 2017- Jan 2018, where included in the study. The patients who had not received tap or IIN/IHN block for postoperative pain relief, were excluded from the study. Similarly, the patients who received additional adjuvants in sub-arachnoid block were also excluded from the study.

The total of 110 patients underwent inguinal hernia repair during the period was identified, after exclusion 60 patients were identified and assigned into two group. Group 1 patients received TAP block and the group 2 patients received the ilioinguinal and iliohypogastric nerve block.

All cases received subarachnoid block with 0.5% bupivacaine without any adjuvants as the primary mode of anaesthesia.

The TAP blocks were performed under ultrasound guidance at the conclusion of the surgical procedure. GE LOGIC-Q ultrasound machine with high frequency linear array probe was used. For TAP block the probe was placed cephalad to iliac crest and caudal to coastal margin. The external and internal oblique muscles and transverse abdominis muscle were identified and the needle tip was targeted between the internal oblique and transverse abdominis then about 20 ml of ropivacaine 0.25% was administered in that plane.

IIN/IHN blocks were also performed under ultrasound guidance at the conclusion of surgery. For IIN/IHN block, a line probe was placed in the spino-umbilical line immediately superior to anterior superior iliac spine. The nerves was identified as small hypo-echoic dots with adjacent small vessel in the same plane. The needle tip was positioned in that plane and 10 ml of 0.25% ropivacaine was administered.

The primary objective of the study was to compare the duration of postoperative analgesia using Visual Analogue Scale (VAS) score and mean duration of rescue analgesia requirement in both groups. The secondary outcomes measured were hemodynamic parameters and any complications, if any.

Perioperative data of the subjected patients were collected retrospectively including age, height, weight, ASA classification, VAS pain scores and the time for rescue analgesia. Hemodynamic parameters such a non-invasive blood pressure and heart rate were collected from the charts. In our hospital VAS pain scores were usually measured at 30 min, 60 min, 90 min, 2 hr, 4 hr, 6 hr, 8 hr, 10 hr, 16 hr, 24 hr postoperatively. Inj. Tramadol 50 mg was given as rescue analgesia when the patient complaints of pain or the VAS score >4. Any complications like nausea, vomiting also noted.

Statistical Analysis

Statistical analysis was done using SPSS version 2 software. The baseline characteristics and outcome variables were described using mean and standard deviation. Dichotomous and categorical variables were expressed as percentages. For continuous variables independent Student's' test was applied and $P<0.005$ was considered statistically significant. For comparing proportion between two groups, Chi-square test was used and p value less than 0.005 was considered statistically significant.

RESULTS

The demographic data were found to be similar in both study groups. Mean age height, weight and body mass index were comparable in both groups. The hemodynamic parameters were comparable in both groups. (Table-1)

The mean duration of rescue analgesic requirement was one of the primary outcomes and was compared among both groups. The mean duration (in minutes) to require rescue analgesia was found to be 320.6 ± 114.2 (min) in group 1 and 410 ± 116.24 (min) in group 2. On comparison of these two values the difference in mean time to rescue analgesic requirement was statistically significant ($p<0.005$). (Table-1)

The mean VAS score at rest was lower in group 2 than in group 1. This difference in mean VAS score was significant at 2nd postoperative hour and remained as such till eight hours postoperatively. During this time the p value was found to be statistically significant and these VAS scores was not significant at other points of time postoperatively. (Table-2)

No side-effects were observed in both the groups postoperatively.

Parameters	Group I	Group II	p Value
Mean Age (in years)	33.6±14.2	34.2±12.8	0.916
Mean Height (in cm)	168.02±5.46	169.42±4.06	0.686
Mean Weight (in kg)	66.48±12.14	71.10±7.34	0.134
Mean B.M.I (kg/m^2)	23.24±4.06	24.56±2.26	0.064
Mean Duration of Rescue Analgesic Requirement (in min)	320.64±114.2	410±116.2	0.004

Table 1. Demographic Parameters and Rescue Analgesic Requirement

VAS at Rest	30 min.	60 min.	90 min.	2 hr.	4 hr.	6 hr.	8 hr.	10 hr.	16 hr.	24 hr.
Group I	0.62±0.46	0.84±0.54	0.92±0.52	1.62±0.64	1.84±0.46	2.26±0.48	3.34±0.44	3.42±0.64	3.76±0.74	3.84±0.78
Group II	0.56±0.38	0.72±0.46	0.76±0.52	0.82±0.58	0.86±0.65	1.26±0.64	2.04±0.68	2.82±0.78	3.62±0.84	3.76±0.86
P Value	0.62	0.324	0.27	<0.001	<0.001	<0.001	<0.001	<0.001	0.482	0.526

Table 2. VAS Scores at Rest

DISCUSSION

Uncontrolled postoperative pain may lead to chronic pain condition and also affect the quality of life. Effective analgesia has been shown to reduce postoperative stress response and accelerate recovery from surgery.[6] Regional nerve block techniques provide a good postoperative pain relief, thus helping in early ambulation of the patient and early discharge. The use of real time ultrasound has improved the quality and success rate of nerve blocks with minimal complications.

TAP blocks and IIN/IHN blocks have been successfully performed for the management of postoperative pain in abdominal surgeries.[1,7,8] Various studies have compared TAP and IIN/IHN block in adults undergoing inguinal hernia repair with contrasting results, where some suggest TAP block as superior one, while others consider the IIN/IHN block as the better option to TAP block.[1,5,9,10]

Our data indicates that patient who received ultrasound guided IIN/IHN block have significantly less postoperative pain score at rest than the patients who received the TAP block after an open inguinal hernia repair. In our study we found that the VAS score at rest was comparable in both groups in the immediate postoperative period and up to 90 minutes after surgery. However, VAS scores at rest was significantly lower in the IIN/IHN block group than the TAP block group. This difference was significant at 2 hr to 8 hr postoperatively. ($p<0.005$). After 10 hr also the VAS score of the IIN/IHN group found to be lower than the TAP block group but the difference was statistically not significant.

These mean VAS score findings correlated with Petersen et al[11] and Kamal[12] et al, who found that in their studies the pain scores were significantly lower in the IIN/IHN block group than the TAP group.

Aveline et al[9] observed that the TAP group have lower significant pain scores than the IIN/IHN group. But this contrast in observation may be due to the fact that the IIN/IHN block in their study was performed by landmark technique without ultrasound guidance, causing less efficacy of the block.

In our study the mean duration of rescue analgesia was found to be 320.6 ±114.2 (min) for the TAP group and 410 ±116.24 (min) for the IIN/IHN group which was found to be statistically significant.

The improved analgesia of IIN/IHN group may be due to the anatomical course of IIN/IHN, the use of ultrasound for performing the blocks as well as the direct peri-neural deliverance of the drug. One more factor that favoured the successful IIN/IHN block was the easier spread of local anaesthetic in to the deep inguinal ring and blocking the genital branch of genitofemoral nerve.[13]

Patients were assessed for occurrence of hypotension, bradycardia, nausea, and vomiting and urinary retention. No statistically significant difference was noted.

One of the limitations of present study was, we studied only male patients of ASA 1 and ASA2. Secondly, we did not follow our patients beyond 24 hours, so the incidence of chronic pain in the study population postoperatively was not known.

CONCLUSIONS

We conclude that ultrasound guided Ilioinguinal block/ Iliohypogastric block is superior to ultrasound guided Transverse abdominis plane block in providing postoperative analgesia after elective unilateral open inguinal hernia repair in adult patients.

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