



ORIGINAL RESEARCH PAPER
COMPARISON OF ROPIVACAINE AND BUPIVACAINE IN ULTRASOUND-GUIDED TRANSVERSUS ABDOMINIS PLANE BLOCK FOR POSTOPERATIVE ANALGESIA IN PATIENTS UNDERGOING LAPAROSCOPIC SURGERY

Anesthesiology
KEY WORDS: Anaesthesia, postoperative analgesia, TAP block

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INTRODUCTION:

Transversus Abdominis Plane (TAP) Block is a regional analgesic technique. It provides analgesia after abdominal surgery. The anterior abdominal wall is innervated by nerve afferents that course through the transversus abdominis neurovascular fascial plane. TAP block allows sensory blockade of abdominal wall skin and muscles when local anesthetic deposited above transversus abdominis muscle (TAM).

Many analgesic modalities are available to alleviate the postoperative pain after abdominal surgeries. The usual trend is to prescribe an opioid or a Nonsteroids Anti-inflammatory Drugs (NSAID) for postoperative analgesia. NSAIDs have certain unwanted effects like hemostasis alteration, renal dysfunction, gastrointestinal discomfort and hemorrhage etc. Intravenous Opioids although provide satisfactory analgesia, but are associated with side effects like respiratory depression, postoperative nausea and vomiting, prolonged sedation and immobilization.

Hence, regional analgesic technique like TAP block widely used for post-operative analgesia. It is safe and effective method of post-operative analgesia.

Method:

After IEC approval 60 patients admitted to GAIMS, G. K. General hospital, Bhuj undergoing laparoscopic surgery were selected and randomly divided into two groups according to computer generated table of randomization.

Group A: 20 ml of 0.25% bupivacaine in TAP block (n=30)

Group B: 20 ml of 0.25% ropivacaine in TAP block (n=30)

INCLUSION CRITERIA:

Age between 20–60 years of either gender, ASA Grade I and II Patients.

EXCLUSION CRITERIA:

ASA Grade III and above, known allergy to study drugs, hematological disorders and active infection at injection site. For the lateral TAP nerve block, a linear transducer is placed in the axial plane on the midaxillary line between the subcostal margin and the iliac crest. The three layers of abdominal wall muscles are visualized: external oblique, internal oblique and transversus abdominis muscles. The target is the fascial plane between the internal oblique and the transversus abdominis muscles. The 22G spinal needle with extension tubing is inserted in the anterior axillary line, and the needle tip is advanced until it reaches the fascial plane between the internal oblique and transversus abdominis muscles approximately in the midaxillary line. Upon reaching the plane, 2 ml of saline is injected to confirm correct needle position after which 20 ml of local anesthetic solution is injected. The transversus abdominis plane is visualized expanding with the injection appears as a hypochoic space.

The anesthesiologist who observed the patients in postoperative ward was blinded to the drug injected in TAP block. Patient was monitored at 30mins, 1, 2, 6, 12 & 24 hours postoperatively. Pain was assessed according to visual analog score from 0 to 10.

Statistical Analysis:

we used student's unpaired t-test for statistical analysis. 'p'-Value indicates the probability of error and a value less than 0.05 is considered statistically significant.

Results:

Following were the observations and results of our study:

- Age wise and weight wise distribution is similar in both the groups, mean age and weight is comparable between both the groups. It was not significant between two groups.

Table 1 - Mean Age In Both Groups

GROUP	N	AGE	
		MEAN	SD
GROUP A (BUPIVACAINE)	30	36.9	11.70854389
GROUP B (ROPIVACAINE)	30	40.33333333	10.67811885
p-VALUE		0.2481	

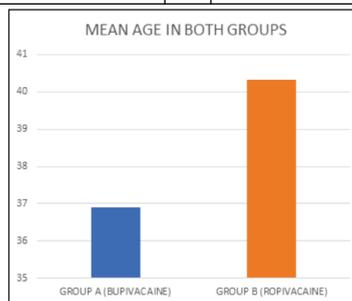
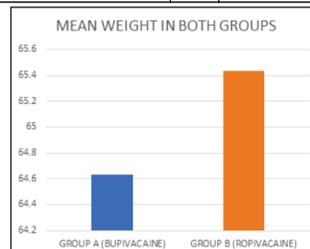


Table 2 - Mean Weight In Kilogram

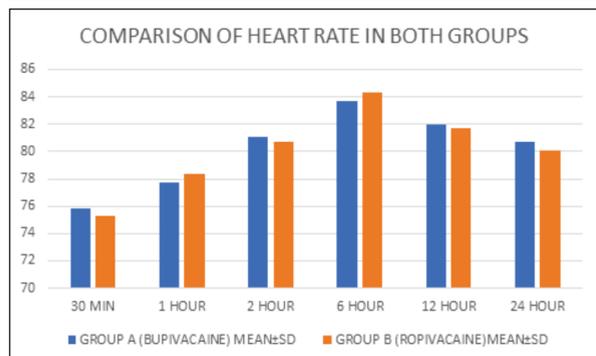
GROUP	N	WEIGHT	
		MEAN	SD
GROUP A (BUPIVACAINE)	30	64.63333333	7.6702
GROUP B (ROPIVACAINE)	30	65.43333333	4.4173
p-VALUE		0.6283	



- Mean heart rate is comparable between two groups. It was not significant between two groups.

Table 3 - Comparison Of Heart Rate In Both Groups

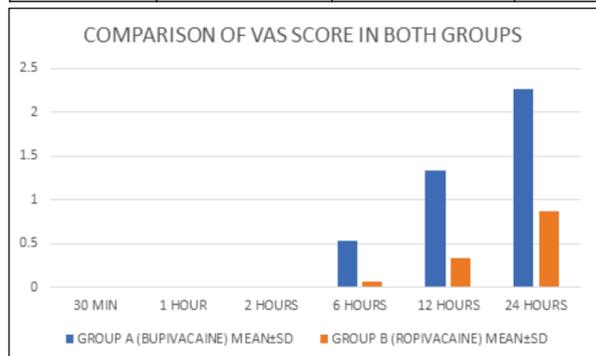
TIME	GROUP A (BUPIVACAINE) MEAN±SD	GROUP B (ROPIVACAINE) MEAN±SD	p-VALUE
30 MIN	75.86667±2.81346	75.3±3.484729	0.4984
1 HOUR	77.7667±1.725946	78.4±1.624808	0.1556
2 HOUR	81.1±1.640122	80.7±1.486607	0.3345
6 HOUR	83.7±1.573743	84.3333±1.699673	0.1463
12 HOUR	81.93333±1.611073	81.73333±1.948219	0.6717
24 HOUR	80.66667±1.324974	80.06667±3.492214	0.3906



- The patient was assessed for postoperative analgesia by visual analog scale. Patients in Group A had pain relief for minimum period of 6 hours postoperatively. Patients in Group B had postoperative analgesia for more than 24 hours. (Table 4)

Table 4 - Comparison Of Vas Score In Both Groups

TIME	GROUP A (BUPIVACAINE) MEAN±SD	GROUP B (ROPIVACAINE) MEAN±SD	p-VALUE
30 MIN	0	0	0
1 HOUR	0	0	0
2 HOURS	0	0	0
6 HOURS	0.533±0.88443	0.0666±0.359	0.0108
12 HOURS	1.333±1.73845	0.3333±0.9067	0.008
24 HOURS	2.266±2.61958	0.8666±1.6069	0.0172



DISCUSSION:

TAP block with 0.25% Ropivacaine provides excellent postoperative analgesia which reduces postoperative morbidity. Using local anesthetic agents in TAP block is a simple and competent analgesic technique, applicable for surgical procedures where parietal pain is a significant component of postoperative pain. The ease of the procedure can also provide an advantage for clinical use. In this study local anesthetic agents like 0.25% ropivacaine and 0.25% bupivacaine used in TAP block provide prolonged postoperative analgesia. The reasons for the prolonged duration of analgesic effect after TAP blockade may relate to the fact that the TAP is relatively poorly vascularized, and therefore drug clearance maybe slowed.

In 2016, Neha Sharma, et al. conclude that mean duration of

analgesia in Ropivacaine group and Bupivacaine group was 12.61±5.13hrs and 9.92±4.81h respectively, the difference was found to be statistically significant. (6)

In 2019, Preethi Vaddi, et al. conclude that 0.5% Ropivacaine provided longer duration of analgesia than 0.25% Bupivacaine when used in TAP block for patients undergoing abdominal surgery. Both drugs have a good safety profile. Comparison of pain score at 8 h and 12h post operatively showed significant difference in both the groups with Bupivacaine having significantly higher VAS scores both at rest and on coughing. (7)

In 2017, Raghunath, et al. concludes that 0.5% Ropivacaine provided longer duration of analgesia compared 0.25% Levobupivacaine when used in TAPB for providing postoperative analgesia after lower abdominal surgeries. The average duration was 419.6 ± 49.95 minutes in group L and 2140± 511.12 minutes in group R. This difference between the two groups was statistically significant (p<0.05). (8)

CONCLUSION:

patients who received 0.25% ropivacaine in TAP block have significantly less VAS score compared to patients who received 0.25% bupivacaine in TAP block. So, we conclude that patient who received 0.25% ropivacaine have pain relief for more longer duration than another group. There was no any adverse event in any patient suggests that both drugs have good clinical and safety profile.

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