



COMPARISON OF POSTOPERATIVE ANALGESIC EFFECTIVENESS OF ROPIVACAINE VERSUS BUPIVACAINE IN ULTRASOUND GUIDED TRANSVERSUS ABDOMINIS PLANE BLOCK

Anaesthesiology

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ABSTRACT

BACKGROUND: The goal of postoperative pain control is to reduce the negative consequences of acute postsurgical pain and help the patient transition smoothly back to normal function. **OBJECTIVES-** To compare Ropivacaine (0.25%) (15ml) with bupivacaine (0.25%) (15ml) in Transversus abdominis plane block in patients posted for infra umbilical surgeries with respect to postoperative analgesia. **METHODOLOGY-** A Prospective Randomized Double blinded clinical study was conducted in 60 patients. 30 in group R (Ropivacaine) and 30 in group B (Bupivacaine) of 18 to 60 years of age with ASA I and II scheduled for elective infra umbilical surgeries. **RESULTS:** The difference in time of rescue analgesia in both the groups were statistically significant ($p < 0.05$). Bupivacaine acts longer than Ropivacaine. **CONCLUSION:** Group R required rescue analgesia earlier than Group B. Bupivacaine 0.25% acts longer than Ropivacaine 0.25% when used in equal volumes in USG guided TAP block for lower abdominal surgeries.

KEYWORDS

Transversus Abdominal Plane (TAP) block, Ropivacaine, Bupivacaine, Infra umbilical surgery, Postoperative analgesia .

INTRODUCTION:

Postoperative pain control aims to reduce the negative consequences of acute postsurgical pain and help the patient transition smoothly back to normal function. Traditionally, opioid analgesic therapy has been the primary treatment for acute postoperative pain. However, the recent rise in morbidity and mortality associated with opioid misuse has led to increasing demands for more investigative efforts into developing pain treatment strategies that emphasize using a multimodal approach¹.

The transversus abdominis plane (TAP) block is a regional anesthesia technique used for postoperative pain management in abdominal wall procedures, providing somatic analgesia to the anterior and lateral abdominal walls. This activity describes the anatomy, techniques, approaches, and complications of the TAP block and highlights the role of the inter professional team in evaluating and managing patients who undergo this procedure. It emphasizes the importance of teamwork in ensuring optimal care and improved outcomes for patients undergoing abdominal surgeries³.

Ultrasound guided transversus abdominis plane (TAP) block involves the injection of LA in between the transversus abdominis (TA) and internal oblique (IO) muscles. TAP block has become one of the most common truncal blocks performed for postoperative analgesia after abdominal surgeries³.

OBJECTIVES:

To compare Ropivacaine (0.25%) (15ml) with bupivacaine (0.25%) (15ml) in Transversus abdominis plane block in patients posted for infra umbilical surgeries with respect to postoperative analgesia

METHODOLOGY:

A Prospective Randomized Double blinded study was conducted on 60 patients. 30 in group R (Ropivacaine) and 30 in group B (Bupivacaine) of 18 to 60 years of age with ASA I and II posted for elective infraumbilical surgeries at Navodaya medical college, Raichur over a period of 18 months from July 2022 to December 2023 after approval from our college ethics committee .

A. INCLUSION CRITERIA:

1. Age- 18 – 60 years of either sex.
2. Patients belonging to ASA Grade I and II.
3. Patients undergoing elective infraumbilical surgeries.

B. EXCLUSION CRITERIA

1. Patient parents refusal for the procedure.
2. Patients with significant coagulopathies and other contraindications for regional anesthesia.
3. Patients with pre-existing significant systemic diseases

4. Patient allergic to local anesthetics.

5. Infection of the skin at the injection site

6. Immunocompromised patients

SAMPLE FORMULA:

$$n = \frac{2(Z\alpha/2 + Z1-\beta)2(\sigma)^2}{d^2}$$

After obtaining ethical clearance from the institution, the procedure was explained to the patients and written Informed Consent was obtained . 60 patients satisfying the inclusion criteria were randomly allocated by using computer generated random numbers and sealed envelope technique into two groups.

Group B – USG guided TAP block with 15ml of 0.25% Bupivacaine.

Group R – USG guided TAP block with 15 ml of 0.25% Ropivacaine.

On the day of surgery, NPO guidelines were followed and an Anaesthesiologist not participating in the study opened the envelope and under sterile precautions prepared 15ml of Bupivacaine 0.5% or Ropivacaine 0.2% accordingly. All patients were given TAP block 15 min before the surgery. Block was performed under standard monitoring of non invasive blood pressure, heart rate, ECG and pulse oximetry. For all patients spinal anaesthesia was administered using 25G Quincke Babcock's spinal needle at L3-L4 space with hyperbaric Bupivacaine. After surgery was done , patients were shifted to postoperative ward and assessed for pain using Numerical rating scale (NRS) at 1st, 3rd, 6th, 12th and 24th hours after surgery. NRS score ranging from 1 to 10 where 1 is no pain, 5 is moderate pain and 10 is worst pain. When NRS score was 4 or > 4 IV tramadol was administered as rescue analgesia.

STATISTICAL ANALYSIS:

Data was collected by using a structure proforma. Data entered in MS excel sheet and analysed by using SPSS 24.0 version IBM USA. Qualitative data was expressed in terms of proportions. Quantitative data was expressed in terms of Mean and Standard deviation. Association between two qualitative variables was seen by using Chi square/ Fischer's exact test. Comparison of mean and SD between two groups was done by using unpaired t test to assess whether the mean difference between groups is significant or not. Descriptive statistics of each variable was presented in terms of Mean, standard deviation, standard error of mean. A p value of <0.05 was considered as statistically significant whereas a p value <0.001 was considered as highly significant

DISCUSSION :

Our study showed that ropivacaine 0.25% and bupivacaine 0.25% both were effective in providing postoperative analgesia in patients who underwent infraumbilical surgeries. Pain was assessed postoperatively at different time intervals by NRS. Duration of Bupivacaine 0.25% was

found to be longer than ropivacaine 0.25% in postoperative period. Vishnubhatla Sravani et al. obtained the same analgesic effect with Bupivacaine 0.25% and Bupivacaine 0.25% in a study conducted on pregnant patients posted for cesarean sections. and that ropivacaine

CONCLUSION

Our findings were 0.25% bupivacaine and 0.25% ropivacaine when used in USG guided TAP block offered good postoperative analgesia, but Bupivacaine provided comparatively longer duration of analgesia than Ropivacaine.

RESULTS:

TABLE1: COMPARISON OF RESCUE ANALGESIA REQUIREMENT

RESCUE ANALGESIA REQUIRED	GROUP B		GROUP R		TOTAL	p
	NUMBER	PERCENT	NUMBER	PERCENT		
1 st hour	4	13.3	7	23.3	11	0.8
3 rd hour	2	6.6	4	13.3	6	0.17
6 th hour	6	20	23	76.6	29	0.0002
12 th hour	22	73.3	16	53.3	38	0.002
24 th hour	24	80	26	86.6	44	0.06

REFERENCES:

1) Horn R, Hendrix JM, Kramer J. Postoperative Pain Control. [Updated 2024 Jan 30]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK544298/>

2) Bartels K, Mayes LM, Dingmann C, Bullard KJ, Hopfer CJ, Binswanger IA. Opioid Use and Storage Patterns by Patients after Hospital Discharge following Surgery. PLoS One. 2016;11(1):e0147972. [PMC free article] [PubMed]

3) Mavarez AC, Hendrix JM, Ahmed AA. Transabdominal Plane Block. [Updated 2023 Nov 13]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK560527/>

4) Sinha S, Palta S, Saroa R, Prasad A. Comparison of ultrasound-guided transversus abdominis plane block with bupivacaine and ropivacaine as adjuncts for postoperative analgesia in laparoscopic cholecystectomies. Indian J Anaesth. 2016 Apr;60(4):264-9. doi: 10.4103/0019-5049.179464. PMID: 27141110; PMCID: PMC4840807.

5) McDonnell JG, O'Donnell B, Curley G, Heffernan A, Power C, Laffey JG. The analgesic efficacy of transversus abdominis plane block after abdominal surgery: A prospective randomized controlled trial. Anesth Analg. 2007;104:193-7. [PubMed] [Google Scholar]

6) Niraj G, Searle A, Mathews M, Misra V, Baban M, Kiani S, et al. Analgesic efficacy of ultrasound-guided transversus abdominis plane block in patients undergoing open appendectomy. Br J Anaesth. 2009;103:601-5. [PubMed] [Google Scholar]

7) Vishnubhatla Sravani1 , Krishna Chaitanya Bevara2 , Inturi Srikanth3 , Dadichiluka Veera Gouri Sankara Rao4 , K. Venkateswara Rao5. EFFICACY OF 0.25% ROPIVACAINE VS 0.25% BUPIVACAINE IN TRANSVERSUS ABDOMINIS PLANE BLOCK FOR ANALGESIA POST CAESAREAN SECTION. Int J Acad Med Pharm 2022; 4 (4): 550-555

8) Charlton S, Cyna AM, Middleton P, Griffiths JD. Perioperative transversus abdominis plane (TAP) blocks for analgesia after abdominal surgery. Cochrane Database Syst Rev. 2010;(12):CD007705. doi: 10.1002/14651858.CD007705.pub2.

9) Michaloliakou C, Chung F, Sharma S. Preoperative multimodal analgesia facilitates recovery after ambulatory laparoscopic cholecystectomy. Vol. 82, Anesthesia and analgesia. 1996. p. 44-51.

10) De Oliveira GS, Fitzgerald PC, Marcus RJ, Ahmad S, McCarthy RJ. A dose-ranging study of the effect of transversus abdominis block on postoperative quality of recovery and analgesia after outpatient laparoscopy. Anesth Analg. 2011;113(5):1218-25.

11) Bharti N, Kumar P, Bala I, Gupta V. The efficacy of a novel approach to transversus abdominis plane block for postoperative analgesia after colorectal surgery. Anesth Analg. 2011;112(6):1504-8. 18. Young MJ, Gorlin AW, Modest VE, Quraishi SA Clinical implications of the transversus abdominis plane block in adults. Anesthesiol Res Pract. 2012;2012.

12) Sharma N, Mehta N, Sharma S. An evaluation of (0.25%) Bupivacaine Vs (0.5%) Ropivacaine for postoperative analgesia using ultrasound guided transversus abdominis plane block for abdominal surgeries: A comparative study. Indian J Clin Anaesth. 2016;3(4):635-9.

13) Patel D, Patel B, Patel H, Shah D, Vachhrajani P. Transversus Abdominis Plane Block for Post Operative Analgesia in Lower Abdominal Surgery : A Comparison of Bupivacaine and Ropivacain. 2016;5 (12):446-50.