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Research Article

Assess the Knowledge of Comparison of Ropivacaine and Bupivacaine in Ultrasound Guided Transversus Abdominis Plane Block for Post-Operative Analgesia in Patients - Among First, Second and Third Year Allied Health Sciences Students

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Abstract

Background: Postoperative pain is a common problem following elective lower abdominal surgeries and can delay recovery if not adequately managed. The ultrasound-guided transversus abdominis plane (TAP) block is an effective regional anaesthesia technique that provides analgesia to the anterior abdominal wall. Long-acting local anaesthetics such as bupivacaine and ropivacaine are commonly used for TAP blocks. Bupivacaine provides prolonged analgesia but has a higher risk of cardiotoxicity, while ropivacaine offers a better safety profile with effective sensory blockade. This study compares ropivacaine and bupivacaine in ultrasound-guided TAP block for postoperative analgesia in patients undergoing elective lower abdominal surgeries. The present study aimed to evaluate the knowledge regarding comparison of ropivacaine and bupivacaine in ultrasound-guided transverse abnominis plane block for post-operative analgesia among first, second, and third year allied health students.

Materials and Methods: A prospective questionnaire-based study was conducted in the Department of OTAT, Dhanalakshmi Srinivasan Medical College and Hospital, Allied Health Sciences, Siruvachur, Tamil Nadu. A total of 60 students were included, with 20 participants in each academic year. The study procedure was explained to all the subjects, and informed consent was obtained. A questionnaire was given to each student of three

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groups and asked to submit within the prescribed time of 30 minutes. The collected data were analysed with SPSS (20.0) software.

Result: The maximum number of subjects in group-III knows pain score is the most important fact in bupivacaine compared to group-I and II. Group I subjects do not know which drug is commonly used for anaesthesia. All the group's subjects have an idea about what general anaesthesia is. Group I and II subjects have less idea about which patient is guided in transversus abdominis surgeries. Group II and III know how to manage the pain during abdominal surgeries more than group I. Group-III and II subjects are aware of post-operative analgesia.

Conclusion: The study results concluded that first and second year students are not very aware of the comparison of Ropivacaine and Bupivacaine in ultrasound-guided. Early clinical exposure to first- and second-year students can improve their knowledge regarding the comparison of Ropivacaine and Bupivacaine in ultrasound-guided transversus abdominis plane block for post-operative analgesia in patients undergoing elective lower abdominal surgeries.

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KEYWORDS: Ropivacaine, Bupivacaine, Post-operative Analgesia, Regional Anaesthesia, Lower Abdominal Surgeries

1. INTRODUCTION

Postoperative pain remains a significant concern following elective lower abdominal surgeries and, if inadequately managed, may result in delayed recovery, prolonged hospital stay, and increased use of systemic analgesics [1-3]. The ultrasound-guided transversus abdominis plane (TAP) block has emerged as an effective regional anaesthesia technique that provides analgesia to the anterior abdominal wall by blocking the sensory nerves supplying the abdominal region. The use of ultrasound guidance enhances the accuracy and safety of the block while improving analgesic outcomes [4, 5]. Long-acting local anaesthetics such as bupivacaine and ropivacaine are commonly employed in TAP blocks to achieve prolonged postoperative pain relief. Bupivacaine is known for its potent and long-lasting analgesic properties; however, its use is associated with a relatively higher risk of cardiotoxicity. This study aims to compare the efficacy of ropivacaine and bupivacaine in ultrasound-guided TAP block for postoperative analgesia in patients undergoing elective lower abdominal surgeries [6, 7]. With this background, the present study aimed to evaluate the knowledge regarding comparison of bupivacaine and ropivacaine in ultrasound-guided transversus abdominis plane block for post-operative analgesia in patients undergoing lower abdominis surgeries among first, second and third year allied health science students.

2. MATERIALS AND METHODS

STUDY DESIGN: A prospective questionnaire study

Study settings: The study was conducted in the Department of OTAT, Dhanalakshmi Srinivasan Medical College and Hospital, Allied Health Sciences, Siruvachur, Tamil Nadu.

Study period: The study was conducted for five months (October 2025- February 2026).

INCLUSION CRITERIA

- Both genders
- Allied Health Science Students

Exclusion criteria

- Not willing to give consent

Study groups

Group-I: Ist year AHS students (n=20)
Group-II: IInd year AHS students (n=20)
Group-III: IIIrd year AHS students (n=20)

Procedure

The study was conducted after Institutional Human Research Committee approval. We included Ist, IInd and IIIrd year allied health students in the study each year, 20, and the total study population is 60. All the subjects were explained the study procedure, and informed consent was obtained. A questionnaire containing 15 question given to each student to fill out within 30 minutes. After the time period, all the answer sheets were collected and analysed.

STATISTICAL ANALYSIS

The data was expressed in numbers and percentages (%). Statistical Package for the Social Sciences (SPSS 20.0) version was used for analysis. Chi-square test applied to find the statistical significance between the groups. A p-value less than 0.05 is considered statistically significant at 95% confidence interval.

3. RESULTS

This study was conducted among first, second and third year allied health sciences students. Group I first year, Group II second year and Group III third year, each of 20 students. The present study compared the knowledge regarding ultrasound-guided transversus abdominis plane (TAP) block among first-, second- and third-year students (n = 20 in each group). Overall, third-year students demonstrated better knowledge in most

domains. The majority of students in all three groups correctly identified the TAP block as the commonly used technique for postoperative analgesia, with higher responses in Group III compared to Group II (50%) and Group I. Regarding the guidance technique, most participants chose ultrasound, again the highest among Group III, followed by Group II and Group I. When asked about the type of surgeries included, lower abdominal surgeries were selected more frequently, particularly in Group III, compared with Groups I and II. Knowledge about the local anaesthetics compared in the study (ropivacaine and bupivacaine) was also greater in Group III than in Groups II and I. For nerve roots involved in the TAP block, the correct option (T6–L1) was identified by 75% of Group III, while only 40% of Group II and 25% of Group I answered correctly. Concerning the primary outcome measured, duration of analgesia was chosen predominantly by Group III (80%), compared to Group I and Group II.

Ropivacaine was considered to provide a longer duration of analgesia by more students in Group III than in the other groups. Similarly, a majority of students recognized that ropivacaine has a better cardiac safety profile, with the highest awareness in Group III, followed by Group II (60%) and Group I Most respondents identified the supine position for performing the ultrasound-guided TAP block, particularly Group III (90%), compared with Group II and Group I. Ultrasound guidance was acknowledged as the factor improving the success rate by 75% of Group III, 60% of Group II, and 50% of Group I. Pain score was correctly chosen as the parameter reflecting block efficacy by the majority of Group III compared to Group II and Group I. Regarding the site of action, abdominal wall nerves were marked by most students, again, highest in Group III. Finally, many third-year students concluded that both drugs are effective, whereas first- and second-year students showed varied responses. (Table-1,2,3)

Table 1: Comparison of knowledge among first, second- and third-year students about Comparison of ropivacaine and bupivacaine in ultrasound-guided transversus abdominis plane block for post-operative analgesia in patients.

Q. No	Question	Option	Group-I n=20		Group-II n=20		Group-III n=20	
			n	%	n	%	n	%
1.	What block is used for post-operative analgesia?	A. Llioinguinal block	3	15.00	2	10.00	2	10.00
		B. Rectus sheath block	6	30.00	3	15.00	2	10.00
		C. TAP block	7	35.00	10	50.00	15	75..00
		D. Caudal block	4	20.00	5	25.00	1	5.00
2.	What guidance technique was used for the block?	A. Landmark technique	3	15.00	6	30.00	4	20.00
		B . Nerve stimulator	5	25.00	4	20.00	0	0.00
		C. Fluoroscopy	4	20.00	2	10.00	2	10.00
		D. Ultrasound	7	35.00	8	40.00	14	70.00
3.	What type of surgeries were included in the study?	A. Upper abdominal surgeries	5	25.00	2	10.00	3	15.00
		B. Thoracic surgeries	4	20.00	5	25.00	1	5.00
		C. Lower abdominal surgeries	8	40.00	7	35.00	16	80.00
		D. Spine surgeries	3	15.00	6	30.00	0	0.00
4.	What local anaesthetics were compared?	A.Pidocaine and prilocaine	3	15.00	2	10.00	2	10.00
		B. Ropivacaine and bupivacaine	7	35.00	10	50.00	15	75.00
		C. Levobupivacaine and lidocaine	6	30.00	3	15.00	2	10.00
		D. Lignocaine and bupivacaine	4	20.00	5	25.00	1	5.00
5.	What nerve roots are involved in the TAP block	A. T1-T4	4	20.00	4	20.00	4	20.00
		B. T4-T8	3	15.00	2	10.00	0	0.00
		C. T6-L1	5	25.00	8	40.00	15	75.00
		D. L2-L5	7	35.00	6	30.00	2	10.00

(*p<0.05 significant)

Table 2: Comparison of knowledge among first, second, and third-year students about Comparison of ropivacaine and bupivacaine in ultrasound-guided transversus abdominis plane block for post-operative analgesia in patients.

Q. No	Question	Option	Group-I n=20		Group-II n=20		Group-III n=20	
			n	%	n	%	n	%
6.	What was the primary outcome measured?	A. Sedation score	5	25.00	5	25.00	1	5.00
		B.Duration of analgesia	8	40.00	7	35.00	16	80.00
		C.Blood loss	4	20.00	2	10.00	3	15.00
		D. Muscle relaxation	3	15.00	6	30.00	0	0.00
7.	What drug provided a longer duration of analgesia?	A. Ropivacaine	6	30.00	5	25.00	4	20.00
		B. Lidocaine	2	10.00	4	20.00	0	0.00
		C.Prilocaine	5	25.00	3	15.00	2	10.00
		D.Bupivacaine	7	35.00	8	40.00	15	75.00
8.	What drug has a better safety {cardiac} profile?	A.Bupivacaine	5	25.00	2	10.00	2	10.00
		B.Ropivacaine	10	50.00	12	60.00	15	75.00
		C.Lignocaine	2	10.00	1	0.00	0	0.00
		D. Prilocaine	3	15.00	5	25.00	3	15.00
9.	What patient position is commonly used only for ultrasound-guided TAP block?	A.prone	4	20.00	2	10.00	1	5.00
		B. lateral	3	15.00	2	10.00	0	0.00
		C.Supine	10	50.00	15	75.00	18	90.00

		D.Sitting	3	15.00	1	5.00	1	5.00
10.	What factor improves the success rate of TAP BLOCK?	A.Landmark technique	3	15.00	2	10.00	2	10.00
		B. Blind injection	2	10.00	1	5.00	3	15.00
		C. Ultrasound guidance	10	50.00	12	60.00	15	75.00
		D.Sedation	5	25.00	5	25.00	0	0.00

(*p<0.05 significant)

Table 3: Comparison of knowledge among first, second, and third-year students about comparison of ropivacaine and bupivacaine in ultrasound-guided transversus abdominis plane block for post-operative analgesia in patients.

Q. No	Question	Option	Group-I n=20		Group-II n=20		Group-III n=20	
			n	%	n	%	n	%
11.	What conclusion supports clinical use of ropivacine?	A.longer duration	4	20.00	5	25.00	2	10.00
		B. Cheaper cost	9	45.00	1	5.00	3	15.00
		C. Better safety profile	6	30.00	10	50.00	15	75.00
		D. Faster onset	1	5.00	4	20.00	0	0.00
12.	What parameter reflects block efficacy?	A. Heart rate only	4	20.00	16	80.00	0	0.00
		B.blood oressure only	0	0.00	1	5.00	2	10.00
		C. Pain score	10	50.00	11	55.00	15	75.00
		D. Oxygen saturation	6	30.00	4	20.00	3	15.00
13.	What is the main site of action of TAP block?	A. Spinal cord	4	20.00	2	10.00	1	5.00
		B. Paravertebral space	2	10.00	0	0.00	0	0.00
		C. Abdominal wall nerves	9	45.00	15	75.00	18	90.00
		D. peritoneum	5	25.00	3	15.00	1	5.00
14.	What was the conclusion of the study?	A. Ropivacaine is superior	5	20.00	2	10.00	2	10.00
		Bupivacaine is unsafe	10	50.00	12	60.00	0	0.00
		C. Both drugs are effective	2	10.00	5	25..00	15	75.00
		D. TAP block is ineffective	3	15.00	1	5.00	3	15.00
15.	What type of anaesthesia technique is the TAP block?	A. General anaesthesia	4	20.00	2	10.00	1	5.00
		B. Central neuraxial nerve block	3	15.00	2	10.00	0	0.00
		C.Peripheral nerve block	10	50.00	15	75.00	18	90.00
		D. Local infiltration	3	15.00	1	5.00	1	5.00

DISCUSSION

The present analytical observational study was conducted in Dhanalakshmi Srinivasan Medical College and Hospital, Siruvachur, among first-year, second-year and third-year Allied health students, Department of OT/AT, for the topic of knowledge regarding comparison of Ropivacaine and Bupivacaine in ultrasound-guided transversus abdominis plane block for post-operative analgesia in patients undergoing elective lower abdominal surgeries [8]. The tables present a comparison of knowledge regarding Ropivacaine and Bupivacaine in ultrasound-guided transversus abdominis plane block for post-operative analgesia in patients undergoing elective lower abdominal surgeries among first, second and third year students. The present study assessed the knowledge of ultrasound-guided transversus abdominis plane (TAP) block and the comparison between ropivacaine and bupivacaine among first-, second-, and third-year students. The findings reveal a steady improvement in knowledge with increasing academic year, with third-year students scoring higher in most domains [9, 10].

A larger proportion of Group III participants correctly identified the TAP block as an effective method for postoperative analgesia and recognised ultrasound as the preferred guidance technique. Better awareness among senior students may be due to greater clinical exposure and repeated reinforcement of concepts during their training. Knowledge regarding the common indication of TAP block for lower abdominal surgeries, the nerve roots involved (T6–L1) [11.12], and the abdominal wall nerves as the site of action was also highest in the third-year group. Similarly, they more frequently chose duration of analgesia as the primary outcome and pain score as the measure of block efficacy, suggesting improved understanding of research and clinical evaluation. Awareness of the pharmacological profile of ropivacaine, particularly its better cardiac safety, was more prominent among final-year students. Many of them concluded that both drugs are effective, reflecting a more balanced clinical interpretation. Overall, the results indicate that knowledge and awareness of TAP block increase with advancement in training [13, 14]. The relatively lower responses among junior students highlight the need for earlier teaching and practical exposure to regional anaesthesia techniques.

4. CONCLUSION

The knowledge about comparison of Ropivacaine and Bupivacaine in ultrasound-guided transversus abdominis plane block for post-operative analgesia in patients undergoing elective lower abdominal surgeries among first and second year Allied health students is less aware compared to third year. These can be overcome by early clinical exposure and training programs, which can increase awareness about Ropivacaine and Bupivacaine.

CONFLICT OF INTEREST: Nil

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