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ORIGINAL RESEARCH

Assessment of the efficacy of postoperative analgesic effect of transversus abdominis plane block compared to wound site local anaesthesia infiltration in tap under spinal anaesthesia

[1]Dr. Basant Chaurasia, [2]Dr. Sandhya Margiya, [3]Dr. Rashim Vachhani, [4]Dr. Shailja Sanjay

[1]Associate Professor, Department of Anaesthesia and Emergency Medicine, Chandulal Chandrakar Memorial Government Medical College, Kachandur, Durg, Chhattisgarh, India
[2]Assistant Professor, [3]Professor, Department of Anaesthesia, Shri Shankaracharya Institute of Medical Science, Bhilai, Chhattisgarh, India
[4]Junior Resident, Department of Anaesthesia, Rama Medical College, Hospital and Research Centre Kanpur, Uttar Pradesh, India

Corresponding author
Dr. Shailja Sanjay
Junior Resident, Department of Anaesthesia, Rama Medical College, Hospital and Research Centre Kanpur, Uttar Pradesh, India
Email: shailnhn_24@yahoo.co.in

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ABSTRACT

Background: Transversus abdominis plane block offers sensory block on the abdominal wall with effective pain blockage, whereas, local anaesthesia infiltration is another technique of reducing opioid use and postoperative pain at the wound site and reducing inflammation. Data is scarce concerning the comparison of the two techniques. **Aim:** The present study was aimed to assess the efficacy of postoperative analgesic effect of transversus abdominis plane block compared to wound site local anaesthesia infiltration in total abdominal hysterectomy under spinal anaesthesia. **Methods:** The study assessed120subjects undergoing elective total abdominal hysterectomy under spinal anaesthesia and were divided into two groups with 60 subjects each.Both groups were given 0.5% bupivacaine as heavy as spinal anaesthesia. In Group I, a bilateral TAP (Transversus abdominis plane) block was given with 0.25% bupivacaine on each side, and in Group II, 20 ml of 0.25% bupivacaine subcutaneously immediately before wound closure. Any systemic side effects, postoperative VAS score, total analgesic consumption in 24 hours, and time to first rescue analgesia were recorded. **Results:** Prolonged postoperative analgesia was seen in the TAP block group at 299.11±24.33 minutes compared to 182.41±24.86 minutes in Group II. Total IV tramadol a rescue analgesic with 24 hours postoperative was significantly higher in Group I with 123.31±42.99 mg compared to 233.31±71.09 mg in Group II. A significant difference was seen for postoperative pain in groups I and II from 24 hours onward. Fewer side-effects were seen in Group I in 16.67% of subjects compared to 33.33% of subjects in Group II. Nausea and vomiting were reported in 4 and 8 subjects from Groups I and II. **Conclusion:** The present study concludes that TAP block has better postoperative analgesia compared to local infiltration as assessed bytotal rescue analgesic requirement, improved quality (lower VAS score),and prolonged duration.

Keywords: bupivacaine, local anaesthesia, Transversus abdominis plane block

INTRODUCTION

Total abdominal hysterectomy is a commonly conducted major surgical procedure that usually results in significant pain and discomfort postoperatively which necessitates efficacious management of the pain to facilitate better and early ambulation with prevention of complications such as myocardial infarction and pneumonia.[1]Following the IASP (International Association for the Study of Pain), pain can be defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Surgical pain is a universal concept that poses adverse effects on the psychological, metabolic, cardiovascular, and

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respiratory systems. Pain has been identified as a 5th vital sign by the American Pain Society which recommends its regular monitoring along with blood pressure and pulse rate.[2]

It is vital to manage postoperative acute pain considering its effect on healthcare costs, timely discharge, and patient satisfaction. Common ways include the use of NSAIDs and/or systemic opioids which are associated with side effects such as urinary retention, nausea, and drowsiness. Regional anaesthesia using local anaesthetics are alternative to eliminate opioid-related side effects. Techniques such as TAP demonstrate efficacy and safety in providing postoperative analgesia for different surgeries including total abdominal hysterectomy.[3]

The TAP block given using the double pop technique at the triangle of Petit provides a wide sensory block on the abdominal wall which effectively eliminates the pain. Another strategy for controlling postoperative pain and decreasing the use of opioids is local anaesthesia infiltration at the site of the wound before the closure. This technique minimizes hyperalgesia, decreases postoperative pain, and reduces inflammation without any compromise on the wound healing.[4]

The main aim of the study was to assess the efficacy of the postoperative analgesic effect of transversus abdominis plane block compared to wound site local anaesthesia infiltration in total abdominal hysterectomy under spinal anaesthesia.

MATERIALS AND METHODS

The present prospective comparative clinical study was aimed to assess the efficacy of the postoperative analgesic effect of transversus abdominis plane block compared to wound site local anaesthesia infiltration in total abdominal hysterectomy under spinal anaesthesia. The study subjects were from the Department of Anaesthesia of the Institute. Verbal and written informed consent were taken from all the subjects before study participation.

The study assessed adult females 120 subjects undergoing elective total abdominal hysterectomy under spinal anaesthesia. The study in total enrolled 120 subjects that were divided into two groups of 60 subjects each where Group I subjects underwent TAP block and other 60 local anaesthesia infiltration on the wound site.

Both groups were given 0.5% bupivacaine as heavy as spinal anaesthesia. In Group I, bilateral TAP (Transversus abdominis plane) block was given with 0.25% bupivacaine on each side and in Group II, 20ml 0.25% bupivacaine subcutaneously immediately before wound closure. Any systemic side-effects, postoperative VAS score, total analgesic consumption in 24 hours, and time to first rescue analgesia was recorded.

For statistical analysis, information on the case record proforma was entered into a Microsoft Excel spreadsheet and was assessed with SPSS (Statistical Package for the Social Sciences) software version 24.0 (IBM Corp., Armonk. NY, USA) was used for assessment of descriptive measures, Student t-test, ANOVA (analysis of variance), Mann-Whitney U test, and Spearman correlation test. The results were expressed as mean and standard deviation and frequency and percentages. The p-value of <0.05 was considered.

RESULTS

The present prospective comparative clinical study was aimed to assess the efficacy of the postoperative analgesic effect of transversus abdominis plane block compared to wound site local anaesthesia infiltration in total abdominal hysterectomy under spinal anaesthesia. For demographic data in two groups of study subjects, the mean age of group I and II subjects was comparable with p=0.196. Similar comparable values were seen for height, weight, and duration of surgery with p=0.491, 0.246, and 0.484 respectively (Table 1).

For the time of the first rescue analgesic in two groups of study subjects, in Group I, the mean time of rescue analgesic was 299.11±24.33 minutes which was significantly higher compared to Group II where it was 182.41±24.86 minutes with a p-value of <0.001 (Table 2). Better postoperative analgesia was seen in Group I compared to Group II.VAS scores from the 2nd postoperative hour onward depicted superior analgesia in group I.

Concerning the side effects encountered in two groups of study subjects, no side effects were noted in 83.35% (n=50) and 66.68% (n=40) subjects from Groups I and II respectively depicting non-significant differences with p=0.139. Vomiting, pruritus, nausea, and urinary retention were reported in 6.66% 9n=4), 0, 6.66% (n=4), and 3.33% (n=2) subjects from Group I and 13.33% (n=8). 3.33% (n=2), 13.33% (n=8), and 3.33% (n=2) subjects from Group II respectively. The difference was statistically non-significant with p=0.139 (Table 3).

It was seen that the two groups were comparable statistically concerning the number of times rescue analgesia was needed in each subject from both groups within 1 day of the surgery. In Group I, 76.6% of subjects needed analgesics once, whereas, 13.33% of subjects from Group II needed analgesics once. Similarly, in Group I, 23.3% of subjects needed analgesics twice and 40% from Group II needed analgesics twice. In Group I, no subject needed analgesics thrice, and in Group II, 46.7% of subjects needed analgesics thrice. These results were statistically significant with p=0.03. The amount of rescue analgesia consumed in 24 hours postoperative in two groups was statistically comparable and was significantly lesser in Group I with p<0.001 depicting better postoperative analgesia.

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Table 1: Demographic data in two groups of study subjects

S. No	Parameters	Group I	Group II	p-value
1.	Age (years)	45.3±5.73	43.1±7.23	0.196
2.	Height (cm)	156.4±5.47	155.61±5.38	0.491
3.	Weight (kg)	57.01±6.12	58.35±5.75	0.246
4.	Surgery duration (mins)	95.71±8.39	90±7.33	0.484

Table 2: Time of first rescue analgesic in two groups of study subjects

S. No		Group I (min)	Group II (mean)	p-value
1.	Time (min)	299.11±24.33	182.41±24.86	**<0.001**

Table 3: Side-effects recorded in two groups of study subjects

S. No	Side-effects	Group I		Group II		Total		p-value
		n	%	n	%	n	%	
1.	None	50	83.35	40	66.68	90	75	0.139
2.	Vomiting	4	6.66	8	13.33	12	10	
3.	Pruritus	0	0	2	3.33	2	1.66	
4.	Nausea	4	6.66	8	13.33	12	10	
5.	Urinary retention	2	3.33	2	3.33	4	3.33	
6.	Total	60	100	60	100	120	100	

DISCUSSION

The study assessed 120 subjects undergoing elective total abdominal hysterectomy under spinal anaesthesiaand was divided into two groups with 60 subjects each.Both groups were given 0.5% bupivacaine as heavy as spinal anaesthesia. For demographic data in two groups of study subjects, the mean age of group I and II subjects was comparable with p=0.196. Similar comparable values were seen for height, weight, and duration of surgery with p=0.491, 0.246, and 0.484 respectively. These data were comparable to the previous studies of Das N et al[5] in 2018 and Sivapurapu V et al[6] in 2013 where authors assessed subjects with demographic data comparable to the present study in their respective studies.

The study results showed that for the time of the first rescue analgesic in two groups of study subjects, in Group I, the mean time of rescue analgesic was 299.11±24.33 minutes which was significantly higher compared to Group II where it was 182.41±24.86 minutes with p-value of <0.001 (Table 2). Better postoperative analgesia was seen in Group I compared to Group II. VAS scores from the 2nd postoperative hour onward depicted superior analgesia in group I. These results were consistent with the findings of Wayu B et al[7] in 2018 and Paul D et al[8] in 2020 where the time of first rescue analgesic was significantly higher with TAP block compared to rescue analgesia in local anaesthetics as seen in the results of the present study.

It was seen that concerning the side effects encountered in two groups of study subjects, no side effects were noted in 83.35% (n=50) and 66.68% (n=40) subjects from Group I and II respectively depicting non-significant differences with p=0.139. Vomiting, pruritus, nausea, and urinary retention were reported in 6.66% 9n=4), 0, 6.66% (n=4), and 3.33% (n=2) subjects from Group I and 13.33% (n=8). 3.33% (n=2), 13.33% (n=8), and 3.33% (n=2) subjects from Group II respectively. The difference was statistically non-significant with p=0.139. These findings were in agreement with the results of McDonnell JG et al[9] in 2007 andMcDonnell JG et al[10] in 2007 where side-effects reported in the two groups in the present study were comparable to the results of the study by the authors.

The study results showed that the two groups were comparable statistically concerning the number of times rescue analgesia was needed in each subject from both groups within 1 day of the surgery. In Group I, 76.6% of subjects needed analgesics once, whereas, 13.33% of subjects from Group II needed analgesics once. Similarly, in Group I, 23.3% of subjects needed analgesics twice and 40% from Group II needed analgesics twice. In Group I, no subject needed analgesics thrice, and in Group II, 46.7% of subjects needed analgesics thrice. These results were statistically significant with p=0.03. The amount of rescue analgesia consumed in 24 hours postoperative in two groups was statistically comparable and was significantly lesser in Group I with p<0.001 depicting better postoperative analgesia. These results were in line with the findings of Atim A. et al[11] in 2011 andElvir-Lazo OL et al[12] in 2010 where several times rescue analgesic needs similar to the results reported by the authors were seen in the present study.

CONCLUSIONS

The present study, within its limitations, concludes that TAP block has better postoperative analgesia compared to local infiltration as assessed by total rescue analgesic requirement, improved quality (lower VAS score),and prolonged duration.

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