



**“A CLINICAL STUDY TO ASSESS THE ADVERSE EFFECTS AND BLOOD PRESSURE FLUCTUATIONS POST USG GUIDED TAP BLOCK WITH 0.25% BUPIVACAINE AND 0.25% BUPIVACAINE WITH 50µG FENTANYL FOLLOWING TOTAL ABDOMINAL HYSTERECTOMY UNDER GENERAL ANESTHESIA”**

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**ABSTRACT**

**Background:** Total abdominal hysterectomy (TAH) is a commonly performed major abdominal surgical procedure in females of perimenopausal age group that results in substantial postoperative pain and discomfort. Postoperative pain requiring bed rest and persistent gastrointestinal dysfunction are key factors that force the patients to stay in the hospital. The transversus abdominis plane (TAP) block is a novel approach for blocking the abdominal wall neural afferents. **Objective:** To Assess the adverse effects and Blood pressure fluctuations post USG guided TAP block with 0.25% bupivacaine and 0.25% bupivacaine with 50µg fentanyl following total abdominal hysterectomy under general anesthesia **Methods:** This clinical study is conducted in the Department of Anaesthesiology and Critical care, Pt. J. N. M. Medical College and Dr. Bhim Rao Ambedkar Memorial Hospital, Raipur (C.G.) from 01/04/2014 to 22/09/2015. **Results:** Nausea was recorded in 11 and 15 patients in group B and F respectively. Vomiting occurred in 2 patients in group B. No other side effects were recorded in any group. The comparison of side effects between the two groups was not statistically significant. ( $p > 0.05$ ). The mean ( $\pm$  sd) values of heart rate (heart beat per minute) at different time intervals. No significant change was observed in HR in either group at any time interval ( $>0.05$ ). No significant changes were observed in SBP & DBP in either group at any time interval ( $>0.05$ ). **Conclusion:** USG guided TAP block with fentanyl and bupivacaine improves analgesia and prolongs the time to first analgesic requirements and decreases the need for postoperative analgesics in patients undergoing total abdominal hysterectomy with minimal side effects only nausea and vomiting is recorded. No significant changes were observed in HR, SBP & DBP in either group at any time interval.

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**INTRODUCTION**

The aim of a TAP block is to place local anaesthetic in the plane between the internal oblique and transversus abdominis muscles targeting the spinal nerves in the plane. Sensory innervations to the skin and muscle of the abdominal wall and the parietal peritoneum will be blocked. The block can be performed by two methods including a blind technique, based on surface anatomy landmarks and an ultrasound-guided technique performed under direct vision. Total abdominal hysterectomy (TAH) is a commonly performed major abdominal surgical procedure in females of perimenopausal age group that results in substantial postoperative pain and discomfort. [1] Real-time ultrasound provides reliable imaging of the three muscular layers of the antero-lateral abdominal wall, the TAP, and the underlying peritoneal cavity.

Ultrasound also provides real-time assessment of correct needle placement and local anaesthetic injection within the TAP, thus potentially increasing the success rate and safety of the TAP block compared to the landmark-based technique. This aims to improve patient satisfaction, facilitate rehabilitation and accelerated recovery from surgery that allows early discharge from hospital. Inadequately treated post-operative pain is associated with several negative effects such as cardio-respiratory complications (tachycardia, dysrhythmias, increased systemic vascular resistance, myocardial ischaemia in susceptible patients, hypoventilation and atelectasis), CNS effects (cognitive impairment, insomnia, anxiety, feeling of helplessness), immobility leads to hypercoagulability, thromboembolic events and persistent gastrointestinal dysfunction which leads to prolonged hospital stay. [2] In such patients, multimodal analgesic technique

reduces morbidity, cost and hospital stay. The mainstay of analgesic modalities after abdominal surgery are systematically administered opiates and central neuraxial techniques. Systemic opioids and neuraxial opioids create the need for increased action and monitoring by staff, frequently requires complicated equipment in the form of monitors and pumps and cause additional undesirable side effects like respiratory depression, drowsiness, sedation, urinary retention, constipation, ileus, pruritus, nausea and vomiting etc. [3] To avoid problems associated with systemic opioids and neuroaxial blocks, peripheral blocks have been introduced and practice to reduce pain originated from abdominal wall incision successfully. [4] Transversus abdominis plane (TAP) block was first described by Rafi in 2001. It provides analgesia to the skin, muscles of anterior abdominal wall and parietal peritoneum. It is one of the latest techniques used to block the sensory afferent nerves of the anterior abdominal wall via a single entry point through bilateral triangle of Petit, hence providing multidermatomal analgesia. [5] TAP block prolongs the time to first analgesic request, reduces postoperative analgesic consumption and reduces opioid related side effects. More recently ultrasound-guided TAP block has been described with promises of better localisation and deposition of the local anaesthetic with improved accuracy. [6]

**METHODOLOGY**

**Method**

This clinical study is conducted in the Department of Anaesthesiology and Critical care, Pt. J. N. M. Medical College and Dr. Bhim Rao Ambedkar Memorial Hospital, Raipur (C.G.) from 01/04/2014 to 22/09/2015. 40 females aged 40-60 yrs undergoing elective total abdominal hysterectomy (TAH) under general anaesthesia were included in this study, after approval from institutional ethics committee, written and informed consent was obtained and use of ultrasound-guided TAP block for postoperative pain relief as well as the use of Visual analogue scale (VAS) graded from 0 cm (no pain) to 10 cm (maximum pain) was explained to all the patients.

All patients were assessed preoperatively the day before surgery including complete history, clinical examination and recording of vital parameters along with routine investigations. All patients were randomly distributed into two groups B (bupivacaine group) and F (fentanyl group) by sealed envelope technique with 20 patients in each group. Patients of group B (bupivacaine group) received 0.25% bupivacaine 20 ml on each side and group F (fentanyl group) received 0.25% bupivacaine 20 ml and 50µg inj. fentanyl on each side.

**RESULTS**

This comparative clinical study is conducted in the Department of Anaesthesiology and Critical care, Pt. J. N. M. Medical College and Dr. Bhim Rao Ambedkar Memorial Hospital, Raipur (C.G.) from 01/04/2014 to 22/09/2015. The results are as follows:

**Table 1** Personal characteristics of study subjects.

Variables	Group B	Group F
Weight (in kg)	56.9 ± 1.138	57.35 ± 1.173
Height (in cm)	145.6 ± 3.84	144.7 ± 4.32
BMI (kg/m <sup>2</sup> )	26.81 ± 1.655	27.31 ± 1.656

The mean (± sd) value of the weight of the patients. Mean weight of the patients in group B was 56.9 ± 1.138 kg and in

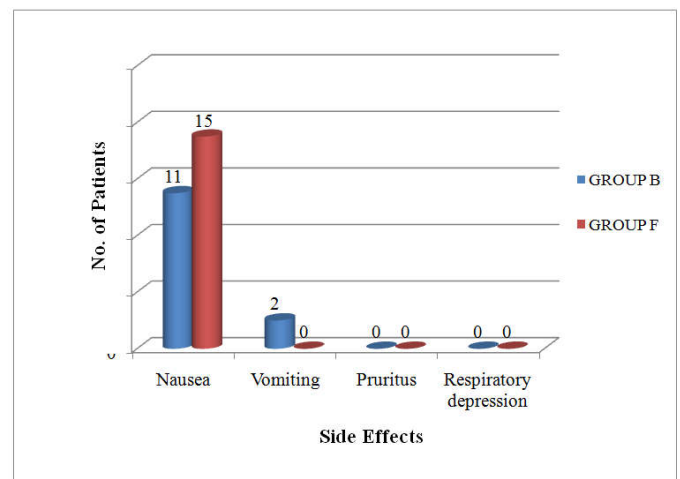
group F it was 57.35 ± 1.173 kg. These values showed that patients in both the groups were comparable with respect to weight. (p > 0.05). The mean (± sd) height of patients. Mean height of the patients in group B was 145.6 ± 3.84 cms and in group F it was 144.7 ± 4.32 cms. These values showed that patients in both the groups were comparable with respect to height. (p = 0.4905). The mean (± sd) values of the BMI of the patients in group B (26.81 ± 1.655) and F (27.31 ± 1.656). These values show that the patients in both the groups were comparable with respect to BMI (p > 0.05).

**Side Effects**

**Table 2** Side Effects Profile

Side effects	Group B		Group F		p - value
	n	%	n	%	
Nausea	11	55	15	75	>0.05
Vomiting	2	10	0	0	>0.05
Pruritus	0	0	0	0	-
Respiratory depression	0	0	0	0	-

Table 2 shows the occurrence of different side effects between the two groups. Nausea was recorded in 11 and 15 patients in group B and F respectively. Vomiting occurred in 2 patients in group B. No other side effects were recorded in any group. The comparison of side effects between the two groups was not statistically significant. (p > 0.05)

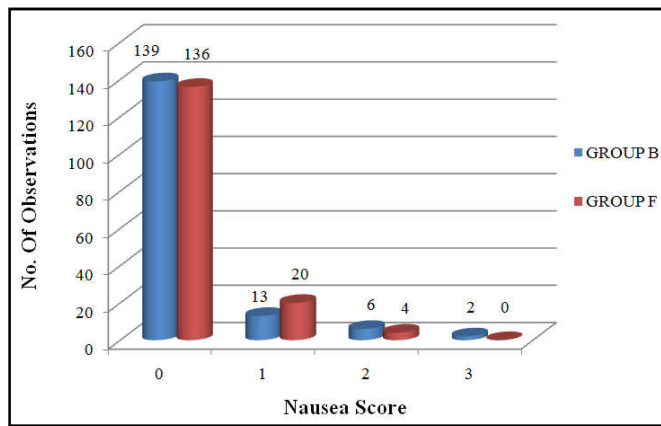


**Graph 1** Side Effects Profile

**Table 3** Distribution of nausea score

Nausea score	No. of Observations		p - value
	Group B	Group F	
0	139	136	0.2705
1	13	20	
2	6	4	
3	2	0	
Total observations	160	160	

Table 3 shows distribution of nausea score between the two groups. Out of 160 observations, it was 0 for 139 observations in group B and 136 times in group F. It was 1 for 13 and 20 times; 2 for 6 and 4 times and 3 for 2 and 0 observation in group B and F respectively. The difference between the nausea score was not statistically significant between the two groups for all the observations. (p > 0.05).

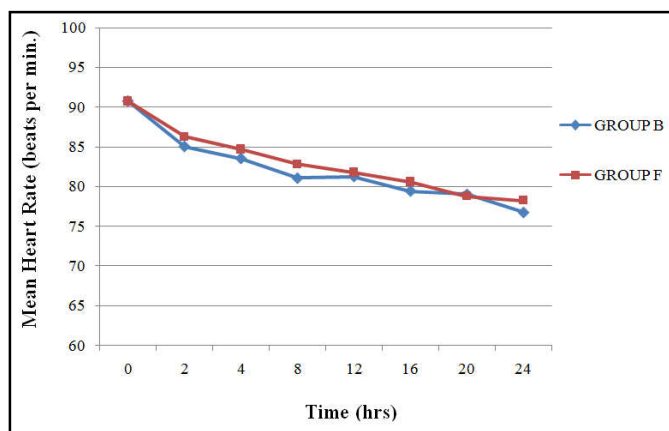


Graph 2 Distribution of nausea score

Table 4 HR at different time intervals

Time (hrs)	Heart Rate						p - value
	Group B			Group F			
	Mean	SD	SEM	Mean	SD	SEM	
0	90.75	4.09	0.91	90.75	4.09	0.91	1
2	85.05	5.26	1.18	86.3	7.65	1.71	0.551
4	83.55	4.51	1.01	84.7	7.12	1.59	0.546
8	81.1	4.56	1.02	82.8	7.37	1.65	0.387
12	81.25	5.65	1.26	81.8	6.31	1.41	0.773
16	79.45	5.25	1.17	80.6	5.92	1.32	0.519
20	79.05	5.21	1.16	78.8	6.85	1.53	0.897
24	76.8	4.11	0.92	78.25	7.75	1.73	0.465

Table 4 shows the mean ( $\pm$  sd) values of heart rate (heart beat per minute) at different time intervals. No significant change was observed in HR in either group at any time interval ( $>0.05$ ). Mean HR decreased over time in both the groups.

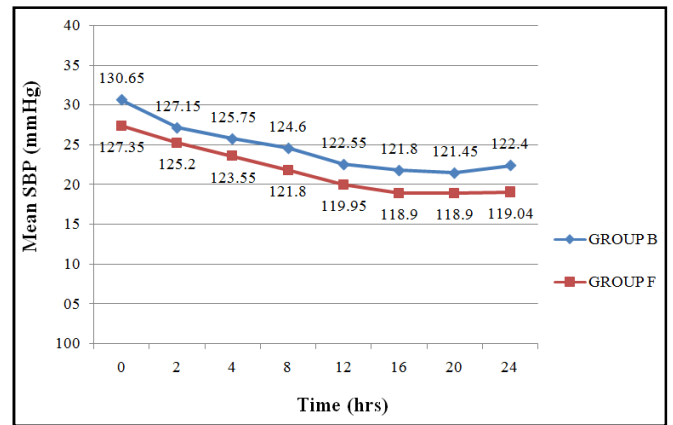


Graph 3 HR at different time intervals

Table 5 SBP at different time intervals (mmhg)

Time (hrs)	Systolic Blood Pressure (mmHg)				p-value
	Group B		Group F		
	Mean	SD	Mean	SD	
0	130.65	6.410	127.35	6.25	0.108
2	127.15	6.141	125.20	5.011	0.278
4	125.75	4.587	123.55	4.640	0.140
8	124.60	5.567	121.80	3.982	0.075
12	122.55	4.670	119.95	5.145	0.103
16	121.80	5.220	118.90	4.778	0.075
20	121.45	5.070	118.90	5.418	0.133
24	122.40	6.320	119.04	6.369	0.041

Table 5 shows the mean ( $\pm$  sd) values of systolic blood pressure at different time intervals. No significant changes were observed in SBP in either group at any time interval ( $>0.05$ ). Mean SBP decreased over time in both the groups.

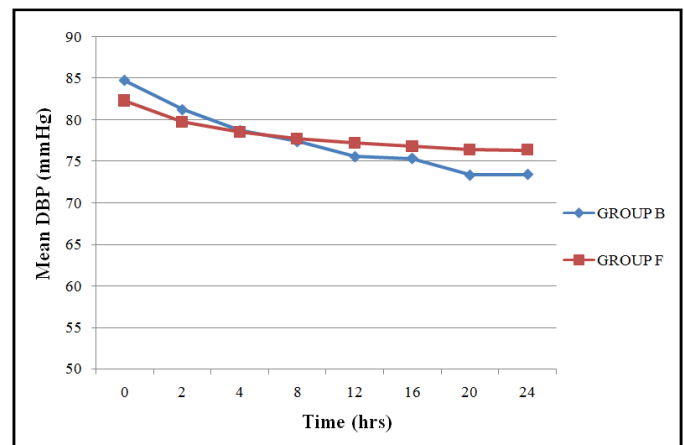


Graph 4 SBP at different time intervals (mmhg)

Table 6 DBP at different time intervals (mmhg)

Time (hrs)	Diastolic Blood Pressure (mmHg)				p-value
	Group B		Group F		
	Mean	SD	Mean	SD	
0	84.75	5.95	82.3	6.19	0.210
2	81.25	5.29	79.75	5.95	0.405
4	78.75	5.52	78.55	6.37	0.911
8	77.4	6.12	77.75	6.37	0.860
12	75.6	6.03	77.2	6.95	0.441
16	75.35	6.59	76.8	5.52	0.455
20	73.4	7.71	76.4	6.12	0.182
24	73.45	7.14	76.35	7.26	0.210

Table 6 shows the mean ( $\pm$  sd) values of diastolic blood pressure at different time intervals. No significant changes were observed in DBP in either group at any time interval ( $>0.05$ ). Mean DBP decreased over time in both the groups.



Graph 5 DBP at different time intervals (mmhg)

## DISCUSSION

Our study subjects were all females undergoing elective total abdominal hysterectomy under general anaesthesia. We chose 40- 60 yrs age group patients. Maximum number of patients, 21 were in the age group of 40-50 yrs (11 in group B; 10 in group F) and 19 patients were in the age group of 50-60 yrs (9 in group B; 10 in group F). The difference was not statistically significant between the two groups with respect to the age of the patients ( $p > 0.05$ ).

Nishikawa K. *et al* (2000)<sup>[7]</sup> in their study they found that the addition of small-dose fentanyl to lidocaine solution in axillary brachial plexus block can increase the success rate and prolong the duration of analgesia, but it delays the onset time of sensory blockade as compared with the same dose of lidocaine although this may be accounted by the decreased pH caused by fentanyl. Moharari R.S. *et al* (2010)<sup>[8]</sup> showed in their study

that addition of fentanyl to lidocaine solution shorten the onset times of sensory and motor blocks during the interscalene brachial plexus block without any increase in side effects. McDonnell J.G. *et al* (2007)<sup>[9]</sup> concluded in their study that the TAP block provided highly effective postoperative analgesia in the first 24 hours after major abdominal surgery. Carney J. *et al* (2008)<sup>[10]</sup> studied the TAP block and stated that it provides effective postoperative analgesia in patients undergoing TAH. They concluded that the TAP block as a component of a multimodal analgesic regimen provided superior analgesia as compared to placebo block up to 48 hours postoperatively. Baaj J.M. *et al* (2010)<sup>[11]</sup> designed a double blind, placebo controlled, randomized study to evaluate the efficacy of ultrasound-guided TAP block for post caesarean section delivery analgesia. They concluded that the analgesic efficacy of ultrasound-guided TAP block after caesarean delivery reduced the postoperative pain score, total morphine consumption, antiemetic drugs and improved patient's satisfaction, and quality of pain relief. Molla Y. *et al* (2015)<sup>[12]</sup> studied that transversus abdominis plane block reduces postoperative analgesic requirement and prolong time to first analgesic request in abdominal surgery in a prospective observational study. Mrunalini P. *et al* (2014)<sup>[13]</sup> studied the analgesic efficacy of transversus abdominis plane block in patients undergoing emergency laparotomies.

## CONCLUSION

USG guided TAP block with fentanyl and bupivacaine improves analgesia and prolongs the time to first analgesic requirements and decreases the need for postoperative analgesics in patients undergoing total abdominal hysterectomy with minimal side effects only nausea and vomiting is recorded. No significant changes were observed in HR, SBP & DBP in either group at any time interval.

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