COMPARISON OF POSTOPERATIVE PAIN SCORE FOLLOWING TRANSVERSUS ABDOMINIS PLANE BLOCK VERSUS PLACEBO, IN PATIENTS UNDERGOING ELECTIVE TOTAL ABDOMINAL HYSTERECTOMY UNDER GENERAL ANAESTHESIA

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ABSTRACT

Objective: To compare the mean postoperative pain score following Transversus Abdominis Plane block versus placebo, in patients undergoing elective total Abdominal Hysterectomy under general anaesthesia.

Study Design: Quasi experimental study.

Place and Duration of Study: Department of Anaesthesia and Intensive Care, Combined Military Hospital Peshawar, from May 2016 to Nov 2016.

Methodology: A total of 74 (37 cases in each group) were included in the study. Group-A received ultrasound-guided bilateral blocks with 0.25% bupivacaine while placebo group (group-B) was administered injection of normal saline.

Results: In group-A 20 patients (54.0%) and in group-B 19 patients (51.4%) belonged to American Society of Anesthesiologist class-I (ASA-I) status while in group-A 17 patients (56.0%) and in group-B 18 patients (48.6%) were having American Society of Anesthesiologist class-II (ASA-II) status. Mean values of height (cm), weight (kg), parity, BMI (kg/m^2) and IV tramadol consumption (mg) were calculated. Comparison of pain score between two group was done, mean pain score in group-A was 1.62 ± 0.49 and in group-B 3.38 ± 0.49. There was statistically significant difference observed between two groups (p<0.001).

Conclusion: The transversus abdominis plane block, as a component of a multimodal analgesic regimen, provided superior analgesia when compared to placebo block at 24 postoperative hours after elective total abdominal hysterectomy.

Keywords: Placebo, Total abdominal hysterectomy, Transversus abdominis plane block.

INTRODUCTION

Total abdominal hysterectomy (TAH) is a gynaecological procedure indicated for heavy menstrual bleeding, uterine prolapse, and gynaecological malignancies or done in emergency peripartum period as a lifesaving procedure. It is associated with significant postoperative pain[1]. Neuraxial anaesthesia however is associated with lesser postoperative pain after total abdominal hysterectomy[2], indicating regional approach for this operation is associated with better postoperative pain control.

Transversus abdominis plane (TAP) block, a component of regional anaesthesia, has gained popularity among surgeons and anaesthetists for postoperative pain control due to lesser side effects of the procedure, relative ease of administration of local anaesthetic under ultrasound guidance and better patient outcomes regarding enhanced recovery and shorter hospital stays. It has decreased the incidence of post-operative pain as well as opioid requirement for pain management after the operation[2]. It is a relatively novel regional anaesthetic technique for post-operative analgesia of the anterolateral abdominal wall. It involves introducing local anaesthetic into the neuro-fascial plane between the internal oblique and the transversus abdominis muscles to provide effective analgesia for lower abdominal surgeries. A number of studies have explored its role in multimodal analgesia and data suggest that it significantly reduces postoperative pain as well as opioid requirements[2-4]. Reductions in opioid consumption and pain scores

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compared with placebo are significant resulting in fewer side effects and increased patient satisfaction[5].

Success with this block is dependent on correct identification of the neuro-fascial plane for which the technique has evolved from a landmark based approach to an ultrasound-guided block placement. Ultrasound use has immensely improved the quality and success of the block[6].

Mean pain scores at rest on 24 hours are markedly reduced in US-Tap block groups as compared to placebo groups[7].

The objective of this study was to compare the mean postoperative pain score following ultrasound guided TAP block versus placebo in patients who had elective total abdominal hysterectomy (TAH) under general anaesthesia. The outcome of this study will help judicious inclusion of ultrasound-guided TAP block in the analgesic regimen as it is cost effective, simple to perform and has increased margin of safety[8].

METHODOLOGY

This quasi experimental study was carried out at Combined Military Hospital, Peshawar from 9th May 2016 to 8th November 2016. Sample size of 74 (37 cases in each group) was calculated using software Open Epi version 3.01, with power of test 90%, confidence interval 80% and margin of error 5% by taking expected mean pain score at rest on 24 hours as 2.2 ± 1.9 and 0.9 ± 1.5 in placebo and US-TAP block groups respectively[7]. Samples were selected by non-probability consecutive sampling. Patients were randomly assigned to one of the two groups by a computer generated random number table. Female patients booked for an elective total abdominal hysterectomy; between ages 18-70 years and who were American Society of Anesthesiologists Physical Status Class I-III were included in the study. Patients allergic to bupivacaine, tramadol or any other drug in the regimen, having BMI >30 kg/m^2, with chronic pain disorders, history of drug abuse, abdominal or gynaecological malignancy, coagulation disorders and infection at the needle insertion site were excluded from the study.

All patients fulfilling the selection criteria were recruited, after obtaining written informed consent. Patients were randomly assigned to one of the two groups by a computer generated randomization table. Demographic characteristics were obtained through a questionnaire. Patients were explored for medical and surgical history, relevant pre-anaesthesia evaluation, examination and investigations were carried out and use of Visual Analogue Scale for Pain was explained. The TAP block group received ultrasound-guided bilateral blocks with 0.25% bupivacaine after induction of anaesthesia. In the placebo-group, injections of normal saline instead of 0.25% bupivacaine were administered. Blocks were performed by a consultant anaesthetist, blinded to the specific group that the patient belonged to. TAP blocks were performed with uniform technical experience as same person performed each block on the patients. General anaesthetic technique and systemic analgesic regimen used in both groups was similar. The patients were followed up after recovery and IV Tramadol was given to supplement analgesia if VAS is ≥4. At 24 hours postoperatively, pain scores for both groups were calculated and relevant data was entered on a predesigned form.

All the data collected was entered into the Statistical Package for Social Sciences (SPSS) version 20. Quantitative variables such as age, height, weight, parity, IM, IV Tramadol consumption (mg) and VAS pain score at 24 hours was presented by means and standard deviations. Qualitative variables such as ASA physical status and marital status were presented as frequencies and percentages. To test the significance of the difference between the two groups in respect of pain scores at 24 hours, t-test was applied. A *p*-value of <0.05 was considered as statistically significant. Post stratification t-test was applied, keeping *p*-value ≤0.05 as significant.

RESULTS

A total of 74 patients (37 in each group) were included in this study. Group-A, the TAP block received ultrasound guided bilateral blocks with

0.25% bupivacaine after induction of anaesthesia while group-B, placebo was given in TAP block using normal saline.

Mean age of the patients was 49.73 ± 7.38 years and 49.43 ± 5.69 years in group-A and B, respectively (table-I). In group-A and B majority of the patients were married (table-I). In group-A, 20 patients (54%) and in group-B, 19 patients (51.4%) belonged to ASA-I status while in group-A 17 patients (46%) and in group-B 18 patients (48.6%) were having ASA-II status (table-I). Mean values of height (cm), weight (kg), parity, BMI (kg/m^2) and IV tramadol consumption (mg) presented in table-II. Comparison of pain score between two group was done, mean pain score in group-A was 1.62 ± 0.49 and in group-B 3.38 ± 0.49. There statistically significant difference was observed between two group (p<0.001) (table-II).

Table-I: Distribution of patients by age, marital status, ASA status.

Age (Year)	Group-A (TAP Block) n (%)	Group-B (Placebo) n (%)
20-40	3 (8.1)	2 (5.4)
41-70	34 (91.9)	35 (94.6)
Mean ± SD	49.73 ± 7.38	49.43 ± 5.69
Marital status		
Married	34 (91.9)	35 (94.6)
Unmarried	3 (08.1)	2 (5.4)
ASA status		
ASA-I	20 (54)	19 (51.4)
ASA-II	17 (46)	18 (48.6)

Table-II: Mean values of height (cm), weight (kg), parity, BMI (kg/m^2) and IV tramadol consumption (mg).

Variables	Group-A (TAP Block) Mean ± SD	Group-B (Placebo) Mean ± SD
Height (cm)	160.16 ± 4.5	160.3 ± 4.8
Weight (kg)	72.2 ± 5.2	72.4 ± 5.2
Parity	3.5 ± 1.0	3.5 ± 1.1
BMI	28.1 ± 1.3	28.2 ± 1.1
Tramadol consumption	109.4 ± 10.3	149.0 ± 13.0
Group (n=37)	**Pain Score at 24 h Mean ± SD**	***p*-value**
Group-A (TAP Block)	1.62 ± 0.49	0.001
Group-B (Placebo)	3.38 ± 0.49	

Comparision of mean pain scores between two groups at 24 hours

Stratification with regard to age, ASA status, BMI, marital status and parity was carried out and presented in table-III.

Table-III: Stratification for age, ASA status, BMI, Marital status, parity.

Age (Year)	Group	Pain Score at 24 h Mean ± SD	*p*-value
20-40	Group-A	1.67 ± 0.57	0.053
	Group-B	3.00 ± 0.00	
41-70	Group-A	1.62 ± 0.49	0.001
	Group-B	3.40 ± 0.49	
ASA Status			
ASA-I	Group-A	1.65 ± 0.48	0.001
	Group-B	3.26 ± 0.45	
ASA-II	Group-A	1.59 ± 0.50	0.001
	Group-B	3.50 ± 0.51	
BMI			
25-27.9	Group-A	1.86 ± 0.37	0.001
	Group-B	3.38 ± 0.51	
28-30	Group-A	1.57 ± 0.50	0.001
	Group-B	3.38 ± 0.49	
Marital Status			
Married	Group-A	1.62 ± 0.49	0.001
	Group-B	3.40 ± 0.49	
Unmarried	Group-A	1.67 ± 0.57	0.053
	Group-B	3.00 ± 0.00	
Parity			
Para 0-3	Group-A	1.63 ± 0.49	0.001
	Group-B	3.32 ± 0.47	
Para 4-6	Group-A	1.61 ± 0.50	0.001
	Group-B	3.44 ± 0.51	

DISCUSSION

TAP block is a widely practiced peripheral nerve block, utilized to anesthetize the somatic nerves supplying the anterior abdominal wall by depositing local anesthetic in the neurovascular plane between internal oblique and transversus abdominis muscle layers. TAP block has subsequently been used as a component of multimodal analgesia for post-operative pain relief following various surgical procedures such as large bowel resection[9], open appendectomy[10], retropubic prostatectomy[11], nephrectomy[12], hernia repair[13], laparoscopic cholecystectomy[14] and cesarean sec-

tion[15]. Sahin *et al*[14] also found that US guided bilateral TAP block in patients under-going laparoscopic cholecystectomy provides superior postoperative pain score.

Carney *et al*[16] have observed analgesic benefit of TAP block in total abdominal hysterectomy by landmark based approach, they effectively demonstrated better postoperative pain control with TAP block along with decreased use of morphine in patients given TAP block up till 48 hours post operatively.

On the contrary Griffith *et al* found that TAP block when used in female patients undergoing midline laparotomy for gynaecological malignancies does not confer any definite analgesic benefit over placebo regimes nor does it show any decrease in requirements for morphine in postoperative period[17] over a multimodal analgesic regimen. Furthermore, the effect of pre incisional TAP block on intraoperative as well as postoperative analgesia in patients undergoing total abdominal hysterectomy remains yet to be elucidated.

We have found the superiority of TAP block in providing postoperative analgesia reflected by a lower VAS score at 24h. The current literature on TAP block is not unanimous in the matter that whether it improves postoperative pain score or not. Our finding is consistent with those of Bacal V2 and Carney *et al*[18].

In 2018, Bacal *et al*[2] in a systemic review and meta-analysis of 14 different studies found that TAP block in total abdominal hysterectomy patients significantly reduces postoperative pain scores. Postoperative morphine consumption also decreased at 2 h and 24 h time period. However, the authors did not address intraoperative opioid requirement.

Sharma *et al*[18] also found that TAP block by landmark technique improves VAS score in first 24h in patients undergoing major abdominal surgery. Petersen *et al*[19] found that TAP block does not provide superior analgesia in comparison to placebo after inguinal hernia repair. In another study by Kamal *et al*[20] ultrasound guided ilioinguinal and iliohypogastric nerve block has shown superior analgesia compared to ultrasound guided TAP block. However ultrasound guided TAP block still reduces postoperative pain and multimodal analgesic requirements as our study has established.

Epidural analgesia is a well-established method of pain control and has been used world over as an effective modality for postoperative analgesia. In this context, a systemic review and meta-analysis by Baeriswyl *et al*[21] after reviewing 10 controlled trials concluded that TAP block and epidural analgesia are equally effective for postoperative pain in children and adults after surgery; moreover TAP block has additional benefit of reduced episodes of hypotension. It was also established that TAP block resulted in shorter hospital stays after the surgery.

Among recent advancement in regional anaesthesia, TAP block has been identified as the most beneficial and promising among all[22]. Ultrasound guidance has increased the efficacy of TAP block resulting in better pain control and reduced opiod requirements.

Present study demonstrates that TAP block provides effective analgesia, in patients undergoing TAH. The TAP block reduced postoperative Tramadol consumption, improved pain scores at rest and on movement, and increased the time to first requirement for supplemental analgesia. The TAP block also reduced sedation in these patients.

CONCLUSION

The TAP block, as a component of a multimodal analgesic regimen, provided superior analgesia when compared to placebo block at 24 postoperative hours after elective total abdominal hysterectomy.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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