

A Comparison between the Post-Operative Pain Relief in Total Hystrectomy with Epidural Bupivacaine and TAP Block

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ABSTRACT

Background: Anesthesia is essential in the treatment of postoperative pain. Epidural analgesia and trans versus abdominis plane (TAP) block are possible options for analgesia for abdominal surgery.

Objective: The main objective of the study is to evaluate and compare the efficacy of epidural bupivacaine and trans versus abdominis plane (TAP) block to provide better post-operative pain relief in total abdominal hysterectomy.

Study design and place of study: This study was a prospective randomized control trial conducted at Department of anesthesiology, Liaquat National Hospital, Karachi for the period July 2017- July, 2018.

Methods: Total 101 patients were enrolled through pre anesthetic assessment before surgery and an informed and written consent was obtained. Patients were allocated in group A and B after taking all ASA monitoring, participants in group A had an epidural catheter passed while Group B patients were given transversus abdominis plane block intra-operatively. A Visual Analogue Scale (VAS) score was used to assess anxiety levels. Statistical test like the chi-square test was used, with a p-value of 0.05 being considered statistically significant

Results: Total 101 participants enrolled, the average age was 45.48 ± 1.06 (Age Rang 30-60years). The mean age of patient in Epidural Group was 47.02 ± 7.62 as compared with TAP Block Group was 43.56 ± 13.35 with p-value 0.007. Majority of the patients has ASA II, 39(61.9%) and 24(38.1%) respectively with p-value 0.240. Pain score at 10 minutes in epidural and TAP Block was reported as 2.16 ± 2.10 and 3.0 ± 2.94 (mild pain) with p-value 0.000 while after 6 hours, the VAS pain score showed mild pain in epidural group as 1.96 ± 1.67 but moderate to severe pain was observed in TAP block patients as 4.28 ± 1.56 with insignificant p-value 0.162.

Study findings will help care taker staff for Post-Operative Pain Relief after the surgery, the benefits of single shot TAP block could be of advantage in situations where epidural analgesia is contraindicated or not desired.

Conclusion: The study concluded better pain relief in patients with epidural bupivacaine when compared with TAP block.

Keywords: TAP Transversus Abdominis Plane ASA Physical Status Score VAS Visual Analogue Scale Epidural block, postoperative pain relief, Total Abdominal Hysterectomy, Transversus Abdominis Plane Block

INTRODUCTION

One of the most frequent operations in gynaecology is the abdominal hysterectomy (AH). AH is used to treat both benign, malignant and open abdominal hysterectomy. What surgical method used is determined by the surgical indication, whether or not the patient has had abdominal or pelvic surgery in the past, the patient's medical history and underlying conditions, body mass index, and the surgeon's level of experience. The surgical method affects both the degree of post-hysterectomy discomfort and the length of the recovery phase. The open abdominal hysterectomy is regarded as a significant procedure and is connected to a level of medium to severe pain.

To ensure patient comfort, early mobility, and a rapid recovery, adequate postoperative pain control is essential. A recent study found that reducing heart and thrombotic events in patients with high-risk can be accomplished by the use of effective postoperative analgesia.⁽¹⁾ In the days and weeks before surgery, opioid analgesics are the most commonly prescribed. They are effective analgesic agents, but come with many unpleasant side effects. A multimodal approach to analgesia is necessary as a result. Postoperative pain relief is greatly improved with the use of regional analgesia and anesthesia.⁽²⁾

Lower abdominal surgeries necessitate the use of alternative techniques of analgesia when epidural catheter is not an option. TAP block is a technique that is most commonly employed.⁽³⁾ Multimodal analgesia has been used in conjunction with TAP catheter-based techniques for abdominal surgery, caesarean section, abdominal hysterectomies^(4,5) and prostatectomy, all of which are relatively recent.^(6,7) For the anterior abdominal wall, this regional anaesthetic technique provide adequate and effective analgesia.⁽⁸⁾ Using ultrasound guidance, Hebbard et al. first described TAP blocks.⁽⁹⁾ The absence of hemodynamic instability, rapid mobilization, and the absence of the need for prolonged urinary catheterization are all advantages of this technique over

neuraxial techniques. However, despite the less complications and high success rate, this method is under highly recommended.⁽¹⁰⁾

The ultrasound uses in anaesthesia has made it feasible to perform a variety of local anaesthesia blocks, which may provide a easy, safe, and effective alternative analgesic regimen or adjuncts. Several abdominal surgeries have made by use of TAP blocks in the transversus abdominis plane. Any lower abdominal surgery, such as a transabdominal hysterectomy, caesarean birth, or any lower abdominal procedure, might benefit from a posterior TAP block to relieve pain after the procedure.

Several randomized trials have been conducted in the past, but none have shown conclusive evidence of one having an edge over the other. Analgesic efficacy of TAP blocks and epidural catheters were evaluated in patients underwent for total hysterectomy in this study.

MATERIALS AND METHODS

The study was conducted at Department of Anesthesiology, Liaquat National Hospital, Karachi after taking Institutional Ethics Committee approval, 101 patients were enrolled after fulfilling the inclusion criteria in the study. The study was designed to be a prospective, randomized controlled trial for the duration of July, 2017 and July, 2018. One hundred and one female patients aged between 30 and 60 years of ASA physical status I/II/III and scheduled under general anesthesia for elective TAH were included. While, patient's refusal, ASA 4, coagulopathy, INR >1.3 or platelet count <80,000 and patient with history of allergy and hypersensitivity to local anesthetic were excluded from the study.

The enrolled patients were randomized and divided into two groups. 56 patients in group A (Epidural) and 45 participants in group B (TAP Block) by using computer generated random number table. Every patient who was selected for the study underwent a thorough pre anesthetic assessment before surgery and an informed and written consent was obtained for every participant of

the study after a proper explanation. In the operating room, patients were allocated in group A and B by using random number table. After taking all ASA monitoring and aseptic measures, participants in group A had an epidural catheter passed at L2-L3 or L3-L4 while Group B patients were given landmark guided bilateral transverses abdominis plane block intraoperatively. Both groups then underwent general anesthesia with endotracheal intubation

At the end of the surgery, vital were noted and motor block was also assessed. Patients were shifted to recovery room where they were observed by the anesthetists. Participants were asked about the severity of pain at 10 minutes, 20 minutes, 30 minutes, 1 hour, 3 hour and 6 hours. Rescue Analgesics (Inj. Nalbuphine) required and any Post-operative side effects were also noted. The data was collected through structured Performa. The pain was evaluated using a visual analogue scale (VAS). Depending on the VAS ratings, postoperative pain was classified into five groups, as 0=no pain, 1-3 = mild pain, 4-6 moderate to severe pain, 7-9 =severe to very severe and last 10= worst pain possible.

Table 1: Patient Characteristics

| Variables | Epidural Group(n=56) | TAP Block Group (n=45) | |
|-----------------------------|------------------------------------|------------------------|-------|
| Age (y) Mean ± SD | 45.48 ± 1.06 (Age Rang 30-60years) | 43.56± 13.35 | 0.007 |
| | 47.02± 7.62 | 43.56± 13.35 | 0.007 |
| ASA (Physical Status Score) | I 16(28.6%) | 20(44.4%) | 0.240 |
| | II 39(69.6%) | 24(53.3%) | |
| | III 1(1.8%) | 1(2.2%) | |

Total 101 of participants enrolled in current study, the average age was 45.48 ± 1.06 (Age Rang 30-60years). The mean age of patients in Epidural Group was 47.02± 7.62. Compare with TAP Block Group was 43.56± 13.35 found statistically insignificant with p-value 0.007. Majority of the patients has ASA II as 39(61.9%) and 24(38.1%) with p-value as 0.240.

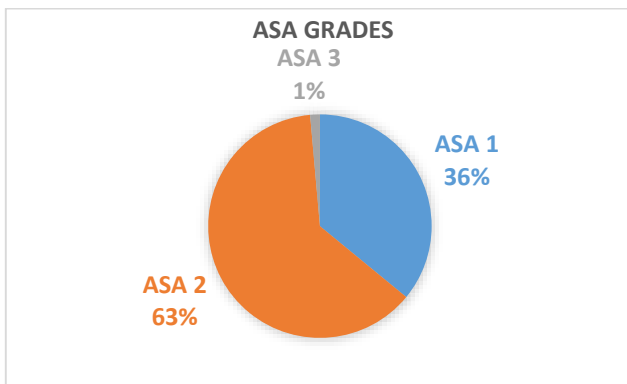


Figure 1: ASA Grades

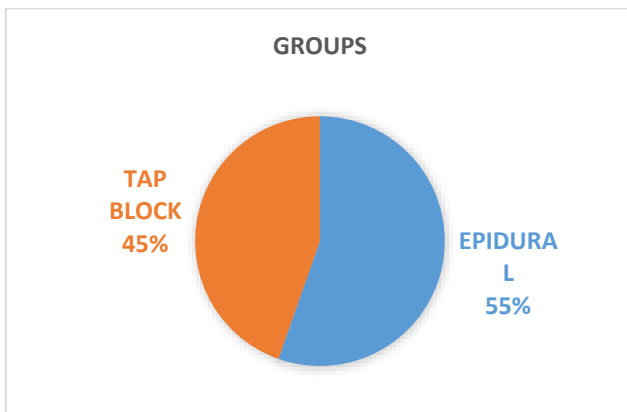


Figure 2: Groups

Figure 3: Difference of Pain Scores between Epidural and TAP Block

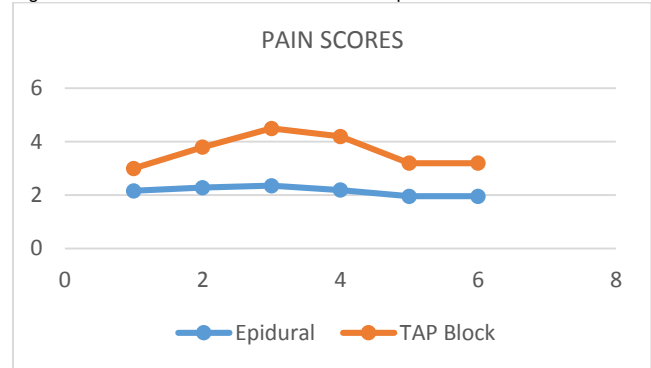


Table 2: Pain Score Stratification with Respect Research Group

| Variables | Epidural Group(n=56) | TAP Block Group (n=45) | P-value |
|-----------------------|----------------------|------------------------|---------|
| 10 Minutes | 2.161± 2.10 | 3.00±2.94 | 0.000 |
| 20 Minutes | 2.29±2.09 | 3.84±3.03 | 0.001 |
| 30 Minutes | 2.36±1.92 | 4.51±2.11 | 0.731 |
| 1 Hour | 2.20±1.73 | 4.24±1.45 | 0.094 |
| 3 Hours | 1.96±1.76 | 4.25±1.50 | 0.352 |
| Pain Relief at 6 Hour | 1.96±1.67 | 4.28±1.56 | 0.162 |

The score for pain were recorded at 10, 20, 30 minutes, 1, 3, and 6 hours of the procedure. Pain score at 10 minutes with epidural and TAP Block group reported 2.16±2.10 and 3.0±2.94 with p-value 0.000 TAP block while after 6 hours, the pain score changed to 1.96±1.67 in epidural anaesthesia patients and 4.28±1.56 in TAP block patients with insignificant p-value 0.162.

Table 3: Rescue Analgesia Required in Each Group

| Rescue | Procedure | | P-value |
|--------|-----------|-----------|---------|
| | Epidural | TAP Block | |
| None | 42(77.8%) | 12(22.2%) | 0.001 |
| Rescue | 14(29.8%) | 33(70.2%) | |

The rescue analgesics required in epidural and TAP block patients a significant difference in scores 14(29.8%) and 33(70.2%) with statistically significant p-value 0.001.

DISCUSSION

The current study was conducted for comparison between the post-operative pain relief in total hysterectomy with epidural bupivacaine and TAP block. Total 101 female patients were enrolled the average age of the patient was 45.48 ± 1.06 (30-60years). The mean age of patients in Epidural Group was 47.02± 7.62 as compared with TAP Block Group was 43.56± 13.35 found statistically insignificant with p-value 0.007. Majority of the patients has ASA II as 39(61.9%) and 24(38.1%) with p-value as 0.240.

Another study conducted by Iyer et. al, (2017), they enrolled 72 patients, out of these 69 completed the trial, of which 36 in the epidural group and 33 in the TAP block group. The mean age in Epidural Group was 46.03± 11.958 compared TAP block 40.52± 11.732 with p-value 0.058. (13)

Similar study conducted by Mukhtar et. al (2022), they included a total of 168 patients grouped in two different groups. The mean age in Group A (local anaesthesia) was 43.87 (+17.21) and Group B (TAP block) was 47.01 (+15.37). There was statistically insignificant difference in the age of the patients of both groups (p-value=0.134). The study had enrolled patients only of ASA I and II grades, and ASA grades of patients were significantly different in two groups (p-value=0.006). (14)

The findings of current study showed that the pain score was recorded by at 10, 20, 30 minutes, 1, 3, and 6 hours of the procedure. It was found that the pain score at 10 minutes with

epidural and TAP Block group as 2.16 ± 2.10 and 3.0 ± 2.94 with p-value 0.000 TAP block which showed show that mild pain was observed at 10 minutes after procedure in both groups but after 6 hours, the score was changed, mild pain in epidural group as 1.96 ± 1.67 and moderate to severe pain observed by TAP block patients as 4.25 ± 1.56 with insignificant p-value (0.162).

The TAP block can be used to provide effective analgesia during lower abdominal incision surgeries. Ultrasound can be used to improve the precision of needle and catheter insertion. TAP block has been used in multimodal anesthesia for a variety of procedures, including Caesarean section, total abdominal resection, open inguinal hernia repair, kidney transplantation, appendectomy, and open prostate removal. It is more potent, in the opinion of its proponents, than oral opioids.^(6,13)

Two related researches of TAP block with 20 ml of 0.25% bupivacaine or levobupivacaine were performed on ASA I and II patients undergoing elective caesarean sections under spinal anaesthesia. The investigations showed that the compared to control (drug-free) groups, research groups had lower pain scores and considerably longer times before they demanded their first analgesic.^(15,16) There was a reduction in the mean VAS score (P 0.001) and a reduced need for opioids in ASA II patients undergoing caesarean delivery under spinal anaesthesia in a different research utilizing 20 ml of 0.375% ropivacaine on either side.⁽¹⁷⁾

A research study conducted by Rao Kadam et. al (2013) and illustrated their research findings, they found that After a caesarean delivery, USG-guided TAP block with 0.5% ropivacaine was associated with lower total 24-hour morphine consumption in the active group (median 18 mg) compared to the placebo group (median 31.5 mg). In the active group, VASs were similarly lower than in the placebo group (96 mm vs. 77 mm P = 0.008). Rao et al. discovered that patients receiving continuous epidural analgesia and a continuous TAP block experienced less pain during major abdominal surgery.⁽¹⁸⁾ According to the authors, postoperative fentanyl requirements, pain scores, and patient satisfaction all remained constant. The analgesia was found to be comparable only during the first 16 hours of treatment, after which epidural patients reported significantly higher VAS scores at rest and when coughing. The epidural group required fewer or no rescue doses than the other groups in our study. At 48 hours, tramadol was required for an extended period of time in the TAP block group (used as a second line analgesic). Patients in the epidural group required 94.4 percent less tramadol following surgery than those in the TAP group. After 48 hours, TAP patients required up to 100 mg of tramadol, whereas no patients in the epidural group required it. Rao et al findings' directly contradicted this.

The rescue analgesics required only 14(29.8%) patients of epidural group while 33(70.2%) of TAP block patients with significant p-value 0.001. In this prospective randomised controlled experiment, which was done by Qazi et al., (2017), 80 patients scheduled for elective procedures requiring midline abdominal wall incisions under general anaesthesia were recruited. Group A got TAP block with 20 ml of 0.2% ropivacaine on either side of the abdominal wall, while Group B received 20 ml of normal saline. The amount of analgesics used overall in a 24-hour period, the time taken to obtain rescue analgesia, and the technique's effectiveness were all evaluated. According to the study's findings, the control group's mean visual analogue scale scores both at rest and during coughing were higher (P > 0.05). When compared to the control group, the study group's time (min) to request the first rescue analgesic was longer (P 0.001).⁽²¹⁾

CONCLUSION

The study concluded that epidural bupivacaine provided superior pain relief compared to TAP block in patients. However, given the scarcity of researches examining the analgesic Additional

randomised studies are required to assess the effectiveness of the two methods in order to make a final, evidence-based choice.

Limitations of the study: It would have been more accurate to reflect the study result's validity with a bigger study sample size. Additionally, because a range of operations were not covered and because single-center studies might influence results.

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