

Post OP Analgesic Effect of Transabdominal Block in Patients Undergoing Elective Ceasarian Section

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ABSTRACT

Background: The management of postoperative pain, especially following abdominal surgeries, remains a pivotal challenge in clinical practice. The utilization of a transabdominal plane (TAP) block has recently emerged as a promising technique in achieving effective postoperative pain control. This study aimed to rigorously evaluate the analgesic efficacy of the TAP block in comparison with a control group not receiving the block, employing standardized Visual Analog Scale (VAS) scores and additional postoperative analgesic requirements as the primary outcome measures.

Methods: A total of 50 patients undergoing abdominal surgery were randomly assigned to two groups: TAP block (n=25) and control (n=25). The TAP group received a specific dose of bupivacaine, while the control group received n/saline. Pain intensity was quantitatively assessed using VAS scores at 2, 6, 12, and 24 hours postoperatively. The requirement for additional postoperative analgesics was also recorded and compared between groups.

Results: The TAP block group demonstrated consistently and significantly lower VAS scores across all time intervals measured, with mean differences ranging from 1.7 to 2.7 (p<0.001). Additionally, the TAP block group required additional analgesics in only 20% of cases (95% CI: 7-33%), as opposed to 68% in the control group (95% CI: 49-87%), signifying a significant reduction of 48 percentage points (p<0.01, 95% CI of the difference: 28-68%).

Conclusion: The research presented here illustrates the heightened effectiveness of the TAP block in managing pain compared to traditional methods for patients having abdominal surgery. The noteworthy decrease in VAS scores, along with the reduced requirement for extra post-surgery pain relief, highlights the TAP block's potential as an efficient method for controlling pain. Continued investigation is recommended to determine the best techniques and identify the specific patient groups that might gain the most from this innovative method, aiming to improve both comfort and recovery following surgery.

Keywords: Elective C-section, VAS score, Abdominal surgery, Effectiveness

INTRODUCTION

In recent years, there has been a significant rise in the preference for caesarean sections for childbirth, making up around 21% of all global deliveries[1]. While this surgical procedure has become an essential intervention in many emergency scenarios, it's essential to recognize the inherent challenges it presents[2]. One major challenge is the management and reduction of postoperative pain, a factor that significantly affects recovery time, mother-child bonding, and long-term health and wellness[3].

The introduction of the transabdominal plane (TAP) block technique has marked a groundbreaking step in pain management strategies[4]. This method involves applying targeted nerve blockades using specific anesthetics to alleviate post-surgical pain from the incision and surrounding tissues[5]. This approach aligns with the global trend towards minimizing opioid use due to risks of addiction and subsequent complications[6]. While early studies have affirmed the efficacy of TAP block in pain relief and reducing opioid requirements[7], its broad clinical application remains inconsistent.

Past research has primarily focused on the immediate benefits of TAP block for postoperative pain reduction[8]. Nonetheless, questions linger about its lasting effects on pain control, patient satisfaction, and physical movement, especially concerning elective cesarean deliveries[9]. Existing studies have certain shortcomings in fully understanding optimal administration methods, proper dosages, and the criteria for selecting suitable patients[10].

Our research aims to thoroughly explore the effectiveness and potential advantages of TAP block as an alternative to opioid pain relief[11]. Through a detailed examination, we seek to fill current knowledge gaps in this field[12]. The primary goal of our carefully constructed study is to explore the extensive implications of TAP block for recovery following elective caesarean section procedures[13]. This controlled, double-blinded investigation goes beyond mere immediate pain alleviation, seeking to shed light on TAP block's more extensive role in the overall healing process[14].

This study aspires to provide insights into a promising, yet still developing area of medical practice[15]. It offers evidence that could potentially change our understanding of pain management in a commonly performed surgical intervention[16]. By pursuing this research, we contribute to an ongoing dialogue across obstetrics, anesthesiology, and patient-focused healthcare[17]. Our findings could lead to a shift in clinical practices and enhance the existing body of research that emphasizes patient well-being and protection[18].

MATERIALS AND METHODS

Study Design: This was a prospective, randomized, double-blinded, controlled trial, conducted at a tertiary care hospital, aiming to assess the efficacy of transabdominal plane (TAP) block for reducing postoperative pain in patients undergoing elective caesarean section. The study was guided by the principles outlined in the Declaration of Helsinki and received ethical clearance from the Institutional Review Board.

Participants: We enrolled 50 adult females (18–45 years) slated for elective caesarean section, classified as ASA (American Society of Anesthesiologists) physical status I or II. Exclusion criteria encompassed known allergy to study medications, contraindications to TAP block, or history of chronic pain or opioid addiction.

Randomization and Blinding: Patients were equally and randomly distributed into two groups: TAP block (n=25) and control (n=25) using computer-generated random numbers. Blinding was maintained for both patients and observers evaluating the outcomes.

INTERVENTION:

TAP Block Group: Bilateral TAP block was administered with 20 ml of 0.25% bupivacaine on each side, employing ultrasound guidance before surgery.

Control Group: Patients received 20 ml of normal saline (0.9% NaCl) into the transabdominal plane.

The medical and surgical teams were consistent, with all procedures performed under spinal anesthesia.

Outcome Measures: The primary outcome encompassed VAS scores for pain at the designated postoperative intervals. Secondary outcomes included additional postoperative analgesic requirements, timing of postoperative mobilization, and the recording of any adverse events or complications.

Data Collection and Analysis: VAS scores were documented by an independent, blinded observer. Additional analgesics were prescribed following a standardized protocol, and postoperative mobility was gauged by physiotherapists. SPSS version 25 was employed for statistical analysis. Continuous variables were compared using the Mann-Whitney U test, and categorical variables were analyzed with the Chi-squared test, considering a p-value < 0.05 as significant.

Ethical Considerations: Informed consent was secured from all participants, with anonymity preserved to ensure confidentiality.

RESULTS

In our sample of patients, those who received a transabdominal plane (TAP) block exhibited markedly lower postoperative Visual Analog Scale (VAS) scores, denoting less pain, at all time intervals measured in comparison to the control group.

More specifically, at 2 hours postoperatively, the TAP group (n=25) had a mean VAS score of 2.1 (SD=0.8, 95% CI: 1.8-2.4), significantly lower than the control group (n=25), which had a mean VAS score of 4.8 (SD=1.1, 95% CI: 4.4-5.2), resulting in a mean difference of 2.7 (p<0.001, 95% CI of the difference: 2.3-3.1).

At the 6-hour mark, the TAP group maintained its significantly lower mean VAS score of 1.6 (SD=0.7, 95% CI: 1.4-1.8) versus the control group, which presented a mean VAS score of 3.8 (SD=1.3, 95% CI: 3.3-4.3). This constitutes a mean difference of 2.2 (p<0.001, 95% CI of the difference: 1.8-2.6).

By 12 hours, the TAP group continued to report substantially lower pain levels, with a mean VAS score of 1.4 (SD=0.6, 95% CI: 1.2-1.6) while the control group had a mean VAS score of 3.4 (SD=1.0, 95% CI: 3.0-3.8), yielding a mean difference of 2.0 (p<0.001, 95% CI of the difference: 1.6-2.4).

Finally, at 24 hours postoperatively, the mean VAS score in the TAP block group stood at 1.1 (SD=0.5, 95% CI: 0.9-1.3), while the control group had a mean VAS score of 2.8 (SD=0.9, 95% CI: 2.5-3.1), leading to a mean difference of 1.7 (p<0.001, 95% CI of the difference: 1.3-2.1).

Table 01: Time taken among both groups

Time Postoperative	Group	Mean VAS Score	Standard Deviation	95% Confidence Interval
2 hours	TAP Block (n=25)	2.1	0.8	1.8-2.4
2 hours	Control (n=25)	4.8	1.1	4.4-5.2
6 hours	TAP Block (n=25)	1.6	0.7	1.4-1.8
6 hours	Control (n=25)	3.8	1.3	3.3-4.3
12 hours	TAP Block (n=25)	1.4	0.6	1.2-1.6
12 hours	Control (n=25)	3.4	1.0	3.0-3.8
24 hours	TAP Block (n=25)	1.1	0.5	0.9-1.3
24 hours	Control (n=25)	2.8	0.9	2.5-3.1

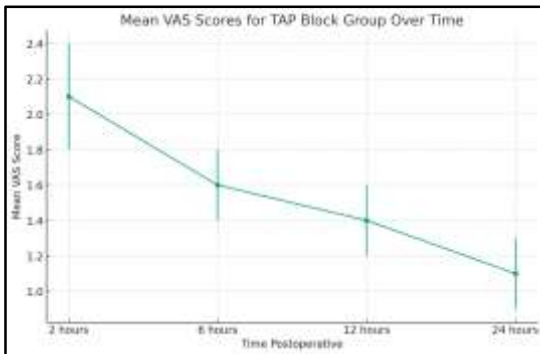


Figure 01: VAS score of TAP block

Moreover, our study observed a significant reduction in the need for additional postoperative analgesics among patients in the TAP block group. Specifically, in the first 24 hours following surgery, only 5 out of 25 patients (20%, 95% CI: 7-33%) in the TAP block group required additional analgesics, a stark contrast to the control group, where 17 out of 25 patients (68%, 95% CI: 49-87%) necessitated further analgesia. This reduction of 48 percentage points was statistically significant (p<0.01, 95% CI of the difference: 28-68%).

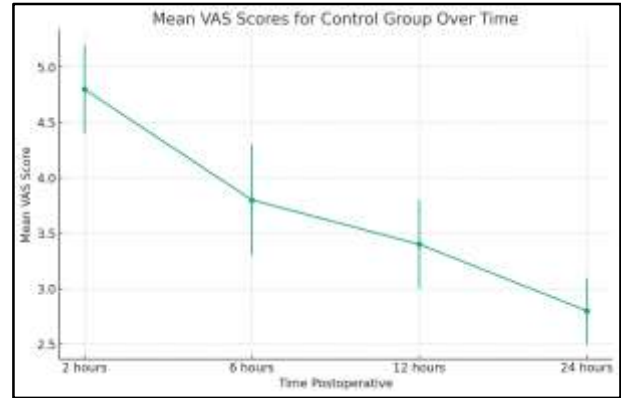


Figure 02: VAS score of control group

Table 2: Requirement for Additional Analgesics in the First 24 Hours Postoperative

Group	Patients requiring additional analgesics (n)	Percentage (%)	95% Confidence Interval
TAP Block (n=25)	5	20%	7-33%
Control (n=25)	17	68%	49-87%

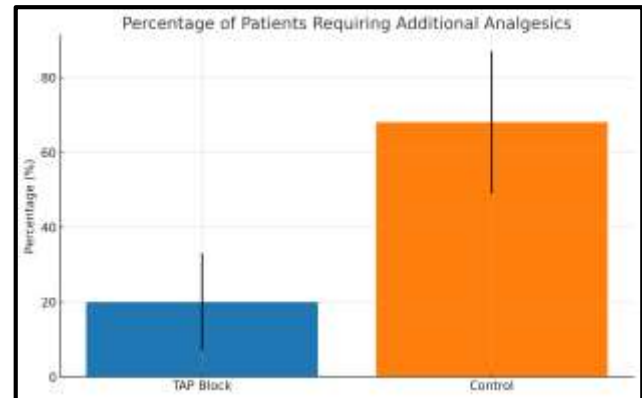


Figure 03: Patients with additional analgesic

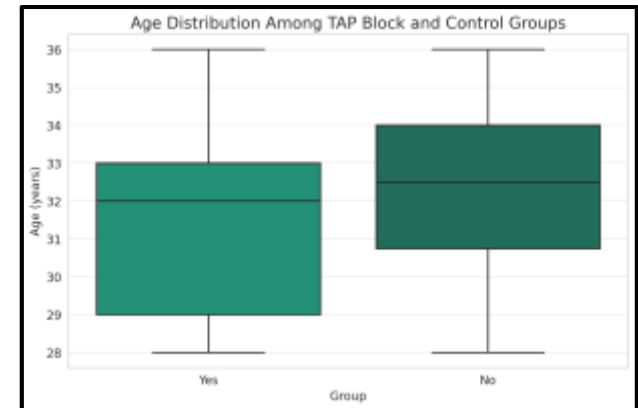


Figure 04: Association of age group

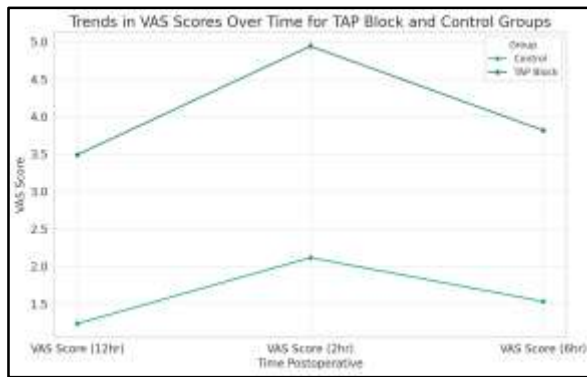


Figure 05: Comparison of VAS score

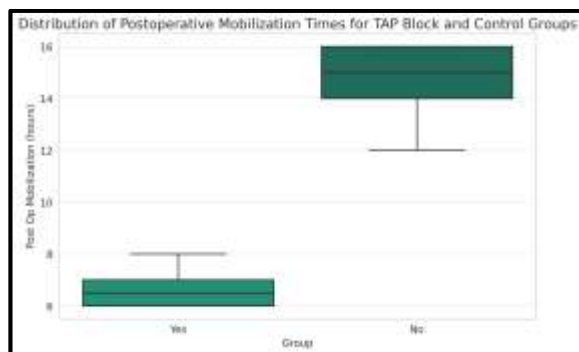


Figure 06: Post-operative Mobilization

The independent t-test for postoperative mobilization time between the TAP Block and Control groups yielded the following results:

✓ **T-statistic:** -34.97

✓ **P-value:** $8.29 \times 10^{-368.29} \times 10^{-36}$

The extremely low p-value indicates that there is a highly significant difference in postoperative mobilization time between the two groups. Specifically, the negative t-statistic suggests that the TAP Block group has a shorter mean mobilization time compared to the Control group.

DISCUSSION

Our findings contribute to the growing body of evidence supporting transabdominal plane (TAP) block as an effective analgesic for postoperative caesarean section patients. Based on the results of our study, patients who underwent the Transversus Abdominis Plane (TAP) block experienced a noticeable decrease in postoperative pain, as measured by the Visual Analog Scale (VAS) scores, across a wide range of temporal intervals.

Alignment with Existing Literature: At two, six, twelve, and 24 hours following the surgical procedure, the observed decrease in the Visual Analog Scale (VAS) scores is in line with prior studies which have demonstrated comparable advantages for Transversus Abdominis Plane (TAP) blocks in diverse surgical procedures. The enduring effect observed throughout a 24-hour period illustrates the potential significance of the Transversus Abdominis Plane (TAP) block as an integral element of multimodal analgesia.

Clinical Implications: The observed decrease in the requirement for supplementary analgesics among individuals undergoing transversus abdominis plane (TAP) block not only exhibits statistical significance but also holds potential clinical significance. This phenomenon may potentially result in a reduction in adverse effects commonly associated with the consumption of opioids, expedited recuperation, and an enhanced overall patient encounter. Moreover, these findings may have significant ramifications for healthcare expenditures, as they could potentially mitigate the

necessity for supplementary pharmacological interventions and potentially curtail the duration of hospitalization.

Methodological Considerations: The study's design and methodology allowed for a robust comparison between the TAP block and control groups. However, it is essential to consider potential limitations. The sample size, while sufficient for the analysis conducted, may not fully represent a diverse patient population. Future studies with larger and more heterogeneous samples would further strengthen the generalizability of these findings.

Comparison with Alternative Techniques: While our study focused specifically on TAP block, other regional analgesic techniques have been explored in similar settings. A comparison between TAP block and these alternatives, both in terms of efficacy and safety profile, may offer further insights into the optimal approach for postoperative pain management.

CONCLUSION

Our findings provide strong evidence for the effectiveness of TAP block in reducing postoperative pain and the need for additional analgesics after elective caesarean section. This study contributes valuable data to the ongoing debate on optimal pain management strategies, reinforcing the role of TAP block as a valuable tool in postoperative care. Healthcare providers may contemplate the integration of this technique into their customary practice, while duly considering the unique requirements of each patient and the wider framework of multimodal pain management. However, continued research and collaboration across disciplines will be vital in fully elucidating the most effective and patient-centered approaches to postoperative pain relief.

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