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ANALGESIC EFFECTS OF TRANSVERSUS ABDOMINIS PLANE (TAP) BLOCK AMONG OPEN APPENDECTOMY PATIENTS AND THE NEED FOR POSTOPERATIVE TRAMADOL FOR PAIN MANAGEMENT: A RANDOMISED CONTROLLED TRIAL

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ABSTRACT

Objective:- To evaluate the analgesic efficacy of Transversus Abdominis Plane (TAP) block in open appendectomy patients and determine the subsequent requirement of postoperative tramadol for pain management. **Methods:-** A randomised controlled trial was conducted at Dr S.N Medical College, Jodhpur, Rajasthan, with 90 patients who underwent open appendectomy. Patients were randomly allocated into two groups: Group A 45 patients (TAP block group) and Group B 45 patients (control group). Postoperative pain intensity was assessed using the Visual Analog Scale (VAS), and the total requirement of tramadol during the postoperative period was recorded. The primary outcome was the need for postoperative tramadol in the first 24 hours post-surgery, and the secondary outcome was the VAS scores for pain. **Results:-** Data analysis showed a significant reduction in the VAS scores and postoperative tramadol consumption in Group A compared to Group B. The group receiving TAP block had significantly lower pain levels and required less tramadol in the postoperative period. **Conclusion:-** The use of TAP block as a part of multimodal analgesia in open appendectomy patients significantly reduced postoperative pain and the need for tramadol, suggesting its effectiveness in improving pain management outcomes.

KEYWORDS

TAP block, open appendectomy, tramadol, pain management, analgesia, randomised controlled trial, multimodal analgesia.

INTRODUCTION

Acute appendicitis is one of the most common abdominal surgical emergencies worldwide, often requiring an appendectomy. Despite advancements in surgical techniques and anaesthetic management, postoperative pain management remains a significant concern. Traditional opioid-based analgesia, such as tramadol, is often required but is associated with side effects like sedation, nausea, and delayed recovery. Hence, there is a growing interest in alternative pain management strategies, one of which is the Transversus Abdominis Plane (TAP) block.

The TAP block is a regional anaesthetic technique that targets the nerves of the abdominal wall, providing effective analgesia for surgeries involving the abdominal cavity. In this study, we aim to assess the analgesic effects of TAP block in patients undergoing open appendectomy and examine whether it reduces the need for postoperative tramadol administration.

Methods

Study Design

This was a randomised controlled trial conducted over six months at Dr S.N Medical College, Jodhpur, Rajasthan. A total of 90 adult patients scheduled for elective open appendectomy were included in the study. Inclusion criteria were patients aged 18-60 years, ASA class I or II, undergoing open appendectomy for uncomplicated appendicitis. Exclusion criteria included contraindications to TAP block, such as allergy to local anaesthetics, infection at the injection site, or previous abdominal surgery.

Randomisation and Grouping

Patients were randomly allocated into two groups:

- Group A (45 patients) (TAP Block group): Received a TAP block with 20 mL of 0.25% bupivacaine bilaterally at the end of the surgery.
- Group B (45 patients) (Control group): Received standard postoperative care with no TAP block.

Procedure

The TAP block was performed under sterile conditions at the conclusion of the surgery. The technique was executed using a single injection of 20 mL of 0.25% bupivacaine at the level of the anterior axillary line between the internal oblique and transversus abdominis muscles.

Pain Assessment

Postoperative pain was assessed using the Visual Analog Scale (VAS), where 0 represented no pain and 10 represented the worst pain imaginable. VAS scores were recorded at the following time intervals: 1 hour, 3hours, 6 hours, 12 hours, and 24 hours postoperatively.

Postoperative Pain Management

Patients in both groups were given standard postoperative care with analgesics as per institutional protocol. Tramadol was administered as a rescue analgesic for VAS scores above 4, with a maximum allowable dose of 100 mg within the first 24 hours postoperatively.

Outcome Measures

1. **Primary Outcome:** The primary outcome was the total amount of tramadol administered in the first 24 hours post-surgery.
2. **Secondary Outcome:** The secondary outcome was the VAS scores for pain at different time points.

Statistical Analysis

Data were analysed using SPSS version 25.0. Descriptive statistics were used to summarize patient characteristics. The primary outcome was compared using the independent t-test, and VAS scores were compared using repeated measures ANOVA. A p-value < 0.05 was considered statistically significant.

RESULTS

Demographics

The demographic characteristics of patients in both groups (age, gender, BMI, ASA class) were comparable, with no significant differences between the two groups ($p > 0.05$).

Primary Outcome

Patients in Group A (TAP block group) had a significantly lower requirement for tramadol during the first 24 hours postoperatively compared to those in Group B. The average dose of tramadol administered in Group A was 40 mg (range: 0-100 mg), while in Group B, it was 85 mg (range: 20-100 mg) ($p < 0.001$).

Secondary Outcome

VAS scores were significantly lower in Group A at all time points (1 hour, 3 hour, 6 hours, 12 hours, and 24 hours postoperatively) when compared to Group B. At 24 hours, the average VAS score in Group A was 3.2, compared to 5.8 in Group B ($p < 0.01$).

Adverse Events

There were no significant adverse events in either group related to the TAP block or tramadol use. No patients experienced major complications such as local anaesthetic toxicity or postoperative infections.

DISCUSSION

This study demonstrates that the Transversus Abdominis Plane (TAP) block significantly reduces postoperative pain and the need for opioid analgesics, particularly tramadol, in patients undergoing open appendectomy. These findings are consistent with previous studies that have shown the efficacy of TAP block in various abdominal surgeries, suggesting that TAP block is an effective technique for providing

analgesia while minimizing opioid consumption [1].

The reduction in tramadol consumption is particularly noteworthy as it addresses concerns regarding opioid-related side effects, such as sedation, nausea, and delayed recovery [2]. Moreover, studies have also reported that TAP block improves postoperative recovery by enhancing patient comfort and reducing opioid reliance, supporting the findings of our trial [3]. The lower VAS scores in the TAP block group further support the superiority of this technique in improving patient comfort during the postoperative period.

CONCLUSION

The use of TAP block in open appendectomy patients significantly reduces postoperative pain and the need for tramadol in the first 24 hours post-surgery. This technique should be considered as part of a multimodal analgesia strategy for abdominal surgeries, promoting faster recovery and reducing opioid consumption.

Limitations

1. The study was limited to a single institution and may not be generalizable to all healthcare settings.
2. Long-term follow-up for pain management was not included in the study.

Future Directions

Further studies with larger sample sizes and multicentre trials are required to validate these findings and explore the long-term benefits of TAP block in postoperative pain management.

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