Comparison of Intrathecal Morphine *versus* Ultrasound-Guided Regional Analgaesia Techniques for Post-Caesarean Recovery Quality

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ABSTRACT

Objective: To investigate the impact of ultrasound-guided regional analgaesia techniques on postoperative recovery and compare them with those of intratecal morphine (ITM) in obstetric patients undergoing elective caesarean delivery (CD).

Study Design: Observational study.

Place and Duration of the Study: Department of Anaesthesiology and Reanimation, Konya City Hospital, Konya, Turkiye, from January to December 2022.

Methodology: The study involved six groups of 30 patients each, categorised by postoperative analgaesia: ITM, posterior transversus abdominis plane block (TAPB), lateral TAPB, transversalis fascia plane block, posterior quadratus lumborum block, and erector spinae plane block. Recovery was assessed using the Obstetric Quality of Recovery Score-10 (ObsQoR-10) at 24 hours, whereas satisfaction was measured with a Likert scale. Time to the first analgaesia, total opioid consumption, nausea, and the need for antiemetics were compared.

Results: ObsQoR-10, satisfaction, and numerical rating scale scores were consistent across groups ($p > 0.05$). The lateral TAPB group required more opioids and had earlier analgaesic requests ($p = 0.009$ and $p = 0.05$, respectively). ITM was more likely to cause nausea and pruritus compared to regional analgaesia techniques ($p = 0.062$ and $p < 0.001$).

Conclusion: Ultrasound-guided regional analgaesia techniques provided similar postoperative recovery and patient satisfaction levels as ITM. Moreover, regional analgaesia techniques, except lateral TAPB, may offer similar alternatives to ITM within multimodal analgaesia strategies for CD.

Key Words: *Caesarean delivery, Multimodal analgaesia, Patient-reported outcome, Regional analgaesia techniques, Quality of recovery*.

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INTRODUCTION

Caesarean delivery (CD) is a common surgical procedure associated with moderate-to-severe acute postoperative pain.[1] The experience of pain during and following CD is consistently highlighted as the primary concern among patients.[1] Effective pain management ensures the well-being of the mother and newborn postoperatively.[2] Furthermore, pain management in the post-CD period extends beyond alleviating pain. It involves decreasing postoperative nausea and vomiting (PONV) and pruritus, and enhancing overall patient satisfaction and recovery.[1]

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Therefore, healthcare providers have increasingly searched for analgaesic techniques that control the pain effectively and optimise recovery quality.[3]

Various surgical and anaesthetic factors influence postpartum recovery. Traditional postoperative outcomes that focus on mortality and morbidity do not adequately capture the patient's overall experience or recovery quality.[4] Recovery questionnaires, such as QoR-40 and QoR-15, have been developed to assess patient-reported outcomes following surgery, evaluating factors such as pain, physical comfort, independence, psychological support, and emotional well-being.[5-7] However, these tools lack essential elements specific to postpartum recovery, such as the ability to care for a newborn. Thus, ObsQoR-11 was developed in 2019 based on the QoR-40.[7] This scoring instrument is a reliable and clinically acceptable tool for assessing postpartum recovery quality in patients undergoing elective and emergency CD.[5-7] Based on patient feedback, Sultan *et al*.[5] modified ObsQoR-11 into the 10-item Obstetric Quality of Recovery Score-10 (ObsQoR-10) by combining

'severe pain' and 'moderate pain' items into a single pain-ranked criterion. ObsQoR-10 has since demonstrated validity, reliability, responsiveness, and clinical applicability in evaluating early postoperative recovery in various healthcare settings.[5,7]

Multimodal analgaesia regimens, including intrathecal opioids, are considered the gold standard for women undergoing CD.[8] However, intrathecal opioids may not be suitable for the pain management in cases where general anaesthesia techniques are preferred. Moreover, the use of intrathecal morphine (ITM) has been linked to undesirable opioid-related side effects, including PONV and pruritus, which may impede postoperative recovery and diminish patient satisfaction.[9]

Regional analgaesia techniques provide targeted and long-lasting pain relief, potentially reducing systemic side effects often linked with ITM.[10] They are valuable approaches for preventing and managing peripartum pain within the obstetric population.[10] The hypothesis was that ultrasound-guided regional analgaesia techniques would lead to a higher recovery quality than ITM owing to their effective pain-relief potential and favourable side-effect profile. The primary aim of this study was to investigate the impact of regional analgaesia techniques on recovery quality following CD using ObsQoR-10, a comprehensive tool for evaluating the nature of recovery in obstetric patients.[5] The secondary aim was to assess how regional analgaesia techniques influence postoperative pain intensity, time to first analgaesic requirement, total opioid analgaesic requirement, nausea, vomiting, antiemetic drug use, and patient satisfaction.

METHODOLOGY

This study was approved by the Ethics Committee of the University of Health Sciences Hamidiye, Faculty of Medicine (No. 21/548, Dated 27 August 2021) and adhered to the principles of the Declaration of Helsinki. It was registered in the Clinical Trials database before patient enrolment (Registration No. NCT05181358). The study was approved by the appropriate Institutional Review Board, and written informed consent was obtained from all participants.

A non-randomised prospective and observational study was conducted on patients undergoing CD at the University of Health Sciences, Konya City Hospital, Department of Anaesthesiology and Reanimation, between January and December 2022. The study included adult obstetric patients scheduled for elective CD, who could read and comprehend written Turkish. Patients aged <18 years, those requiring maternal or neonatal intensive care admission following birth, those undergoing general anaesthesia for CD, and those with a history of anxiety, depression, chronic pain or smoking were excluded.

The clinic employed two distinct approaches for perioperative anaesthesia and postoperative analgaesia in caesarean deliveries. The first approach incorporated spinal anaesthesia with 100 micrograms of ITM. Conversely, the second approach excluded ITM and integrated regional analgaesia techniques including lateral transversus abdominis plane block (TAPB), posterior TAPB, posterior quadratus lumborum block (QLB), erector spinae plane block (ESPB) or transversalis fascia plane block (TFPB), according to clinical protocols adapted from international guidelines post-surgery.

For the patients not receiving intrathecal morphine, postoperative analgaesia was performed using lateral TAPB, posterior TAPB, posterior QLB, ESPB or TFPB blocks, as per literature descriptions and guided by ultrasound, with 40 ml of 0.25% bupivacaine bilaterally. In the case of the lateral approach for TAPB, local anaesthetic was applied between the linea semilunaris and midaxillary line, whereas the posterior TAPB was applied posterior to the midaxillary line, following the fascial plane between the transversus abdominis and internal oblique muscles. For ESPB, local anaesthetic was injected at T9 between the transverse process and erector spinae muscle. Posterior QLB was defined as the injection of local anaesthetic between the quadratus lumborum and psoas muscles at L4. TFPB was described as the application of local anaesthetic between the transversalis fascia and transversus abdominis muscle.[11] All blocks were performed under ultrasound guidance, which significantly contributed to patient safety and the success of the procedure.

Potential complications associated with the techniques used included skin infections, haematoma, and nerve injury. These risks were minimised with the use of ultrasound. An experienced anaesthesiologist independently determined the approach based on routine practice without research knowledge. To ensure an unbiased assessment of outcomes, patients who underwent either ITM or regional analgaesia techniques were evaluated at the 24th postoperative hour by a researcher who did not know the specific anaesthesia technique applied. Data collection was completed upon reaching a sample size of 30 patients for each approach.

The primary outcome of this study was to investigate the impact of regional analgaesia techniques, such as lateral TAPB, posterior TAPB, posterior QLB, ESPB, and TFPB on postoperative ObsQoR-10 scores and compare them with those of ITM. Participants were requested to complete the ObsQoR-10 questionnaire, which is rated on an 11-point Likert scale (0 = worst; 10 = best), to assess their postoperative recovery. Moreover, they rated their satisfaction with the applied analgaesia method using a separate 5-point Likert satisfaction scale (1 = least satisfied; 5 = most satisfied) at the 24th postoperative hour. The ObsQoR-10 questionnaire, developed by Sultan *et al*., assesses postpartum recovery quality and health status in obstetric patients.[5] This tool comprises 10 questions and evaluates four key aspects of recovery: Physical comfort (e.g. side effects such as nausea, vomiting, dizziness, and shivering), physical independence (e.g. mobility, care of the newborn, and personal hygiene), emotional well-being (e.g. feeling in control), and pain levels. Each ObsQoR-10 question is scored on the 11-point Likert scale (0 = strongly negative; 10 = strongly positive). The total score ranges from 0 (worst recovery quality) to 100 (best recovery quality). In 2022, Kozanhan *et al*. conducted the validation of the ObsQoR-10 questionnaire in the Turkish language.[12]

The secondary outcomes were the impact of regional analgaesia techniques on postoperative pain intensity, duration until the first analgaesic request, total opioid analgaesic consumption, incidence of nausea and vomiting, utilisation of antiemetic drugs, and patient satisfaction with the employed analgaesic method.

The postoperative multimodal analgaesia protocol at the clinic included administering 1 gram of paracetamol intravenously three times a day, 50 mg of dexketoprofen intravenously twice daily and intravenous morphine as a rescue analgaesic when the Numerical Rating Scale (NRS) pain score was ≥3.

Patients received prophylactic antiemetic treatment with ondansetron. The assessment of postoperative nausea and pruritus employed a 4-point scale: 0 = no symptoms; 1 = mild symptoms; 2 = moderate symptoms; and 3 = severe symptoms. Evaluation of the level of sedation utilised a 4-point scale: 1, awake and alert; 2, somewhat drowsy, easily aroused; 3, sleepy and falling asleep while speaking; and 4, drowsy, minimal or no response to physical stimulation. Data regarding the postoperative pain intensity (0, 1, 2, 3, 4, 8, 12, 16, 20, and 24 hours at rest and in motion NRS), time to first analgaesic request, total opioid consumption in the first 24 hours, PONV and antiemetic requirement, and data on functional recovery such as the first oral intake and the hours of standing up unaided were collected by an investigator blinded to the study groups.

RESULTS

In total, 195 cases were assessed; 15 did not give consent to participate and the remaining 180 cases were evaluated. The flowchart is shown in Figure 1.

No significant differences were found in the analysis of participant demographics, including age, weight, height, body mass index, gravida and parity numbers, and gestational week, among the groups ($p > 0.05$, Table I). No significant differences were observed between the groups regarding neonatal APGAR scores at 1 and 5 minutes, operation duration, and estimated blood loss ($p > 0.05$). The total ObsQoR-10 scores were comparable ($p > 0.05$) among the six groups (Table II).

Table I: Demographic data of groups.

Characteristics	Group ITM	Group posterior TAPB	Group lateral TAPB	Group TFPB	Group posterior QLB	Group ESPB	p-value
Age (year)	28 ± 4.9	30.1 ± 4.9	29.4 ± 5.2	29.4 ± 5.2	27.7 ± 5.0	29 ± 3.5	0.348
Weight (kg)	80.4 ± 7.8	85.3 ± 11.5	81.50 ± 11.3	79.2 ± 13.2	80.9 ± 8	85.1 ± 9.8	0.124
Height (cm)	159.9 ± 4.6	161.8 ± 3.4	160.5 ± 5.2	161.7 ± 6.2	160 ± 5.8	162.8 ± 5	0.411
BMI (kgm^{-2})	31.5 ± 3.1	32.6 ± 4.4	31.6 ± 4.1	30.3 ± 4.3	31.3 ± 3.3	32.2 ± 3.1	0.234
Gravity number	2 (2-3)	2 (2-3)	3 (2-4)	3 (2-4)	2 (2-3)	3 (2-3)	0.249
Parity number	2 (2-3)	2 (2-3)	2 (2-3)	2.5 (2-3)	2 (2-3)	2 (2-3)	0.356
Gestational week	38 (38-39)	39 (38-39)	38 (38-39)	39 (38-39)	38.5 (38-39)	38 (38-39)	0.427
Newborn APGAR score at 1 minute	8 (8-8)	8 (8-8)	8 (8-8)	8 (8-8)	8 (8-8)	8 (8-8)	0.837
Newborn APGAR score at 5 minute	9 (9-9)	9 (9-9)	9 (9-9)	9 (9-9)	9 (9-9)	9 (9-9)	0.875

Statistical test applied: One-Way ANOVA and Kruskal-Wallis test. cm: centimetre, kg: Kilogram, BMI: Body mass index. Data are presented as mean ± standard deviation or median (25^{th}-75^{th} percentile). ITM: Intrathecal Morphine. Lateral TAPB: Lateral Transversus Abdominis Plane Block, Posterior TAPB: Posterior Transversus Abdominis Plane Block, TFPB: Transversalis Fascia Plane Block, Posterior QLB: Posterior Quadratus Lumborum Block, ESPB: Erector Spina Plane Block.

Table II: ObsQoR-10 score distribution of the groups.

ObsQoR-10 questions	Group ITM	Group posterior TAPB	Group lateral TAPB	Group TFPB	Group posterior QLB	Group ESPB	p-value
Pain	7(7-8)	7(6-8)	6.5(5-7)	7(5-8)	7(5-8)	7(5-8)	0.290
Nausea or vomiting	6(6-7)	7(6-7)	7(6-7)	6.5(6-7)	7(6-8)	7(6-8)	0.094
Dizziness	8(7-8)	7(7-8)	7(7-8)	8(7-8)	8(7-8)	7(6-8)	0.176
Shivering	8(7-8)	8(7-8)	8(7-8)	8(7-9)	8(8-9)	8(8-8)	0.277
Comfortable	8(7-8)	8(7-8)	7(7-8)	7(7-8)	8(7-8)	7(6-8)	0.263
Ability to mobilise independently	7(6-8)	7(6-7)	6(6-7)	7(7-7)	7(7-7)	7(6-7)	0.063
Ability to hold baby without assistance	8(8-9)	9(8-9)	8(8-9)	9(8-9)	8(8-9)	8(8-9)	0.234
Ability to feed/nurse baby without assistance	8(8-9)	9(8-9)	8(8-9)	9(8-10)	9(8-10)	9(7-10)	0.111
Ability to look after personal hygiene	8(7-9)	8(8-8)	8(7-8)	8.5(7-9)	8(8-9)	8(7-9)	0.088
Feeling in control	7(7-8)	8(7-8)	8(7-8)	8(8-8)	7(7-8)	8(7-9)	0.083
Total score	76(73-77)	76(73-78)	75(70-77)	77(75-80)	77.5(73-82)	75(70-82)	0.312

Statistical test applied: Kruskal-Wallis test. ObsQoR: Obstetric Quality of Recovery. Scores of questions 1-4 were converted (so 0 = 10, 1 = 9,2 = 8, 3 = 7, 4 = 6, 5 = 5, 6 = 4, 7 = 3, 8 = 2, 9 = 1, and 10 = 0). Data are shown as median (25^{th}-75^{th} percentile). ITM: Intrathecal Morphine. Lateral TAPB: Lateral Transversus Abdominis Plane Block, Posterior TAPB: Posterior Transversus Abdominis Plane Block TFPB: Transversalis Fascia Plane Block, Posterior QLB: Posterior Quadratus Lumborum Block, ESPB: Erector Spina Plane Block.

Table III: Rescue analgaesic used by time of groups.

Time (hour)	All patients	Group ITM	Group posterior TAPB	Group lateral TAPB	Group TFPB	Group posterior QLB	Group ESPB	p-value
0-6	38 (%21.1)	3 (10%)	3 (10%)	9 (30%)	3 (10%)	4 (13.3%)	6 (20%)	0.190
6-12	90 (%50)	12 (40%)	16 (53%)	21 (70%)	17 (56.7%)	13 (43.3%)	11 (36.7%)	0.096
12-18	92 (%51.1)	12 (40%)	18 (60%)	12 (40%)	17 (56.7%)	15 (50%)	18 (60%)	0.386
18-24	39 (%21.7)	10 (33.3%)	5 (16.7%)	8 (26.7%)	5 (16.7%)	5 (16.7%)	6 (20%)	0.518

Statistical test applied: Chi-square test. Data are presented n (%). ITM: Intrathecal Morphine, Lateral TAPB: Lateral Transversus Abdominis Plane Block, Posterior TAPB: Posterior Transversus Abdominis Plane Block, TFPB: Transversalis Fascia Plane Block, Posterior QLB: Posterior Quadratus Lumborum Block, ESPB: Erector Spina Plane Block.

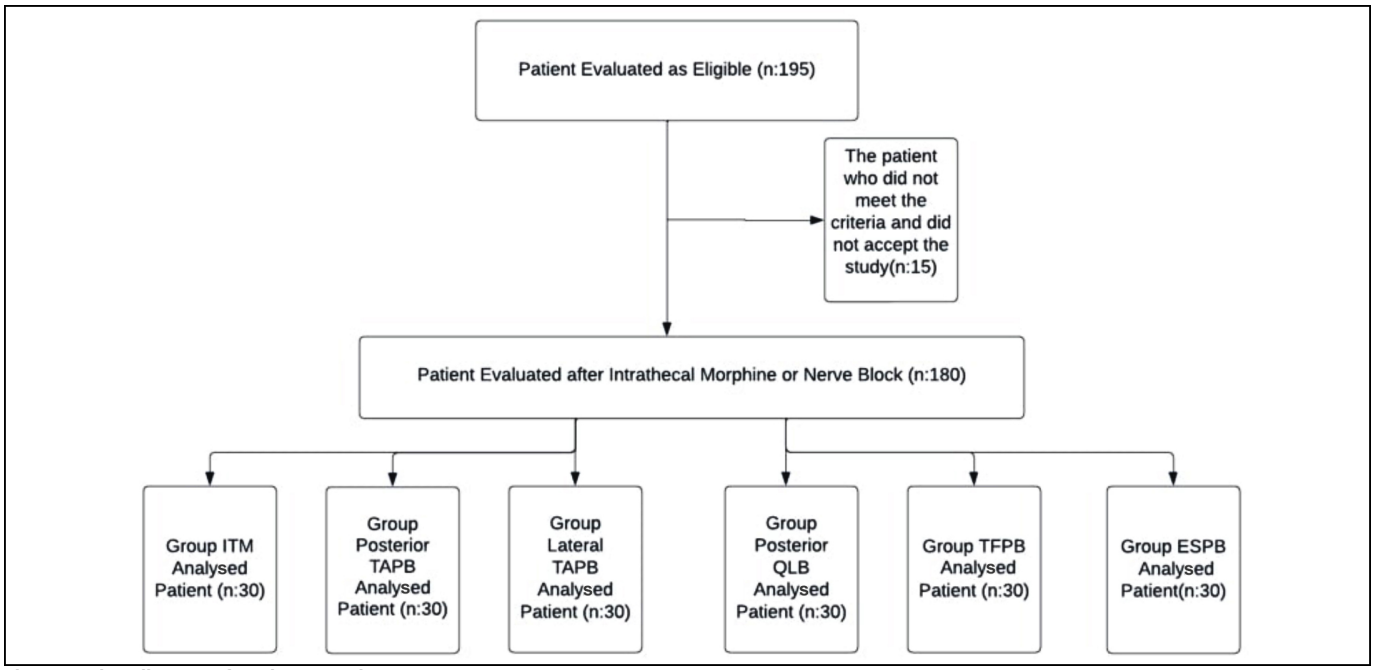

Figure 1: Flow diagram of study protocol.

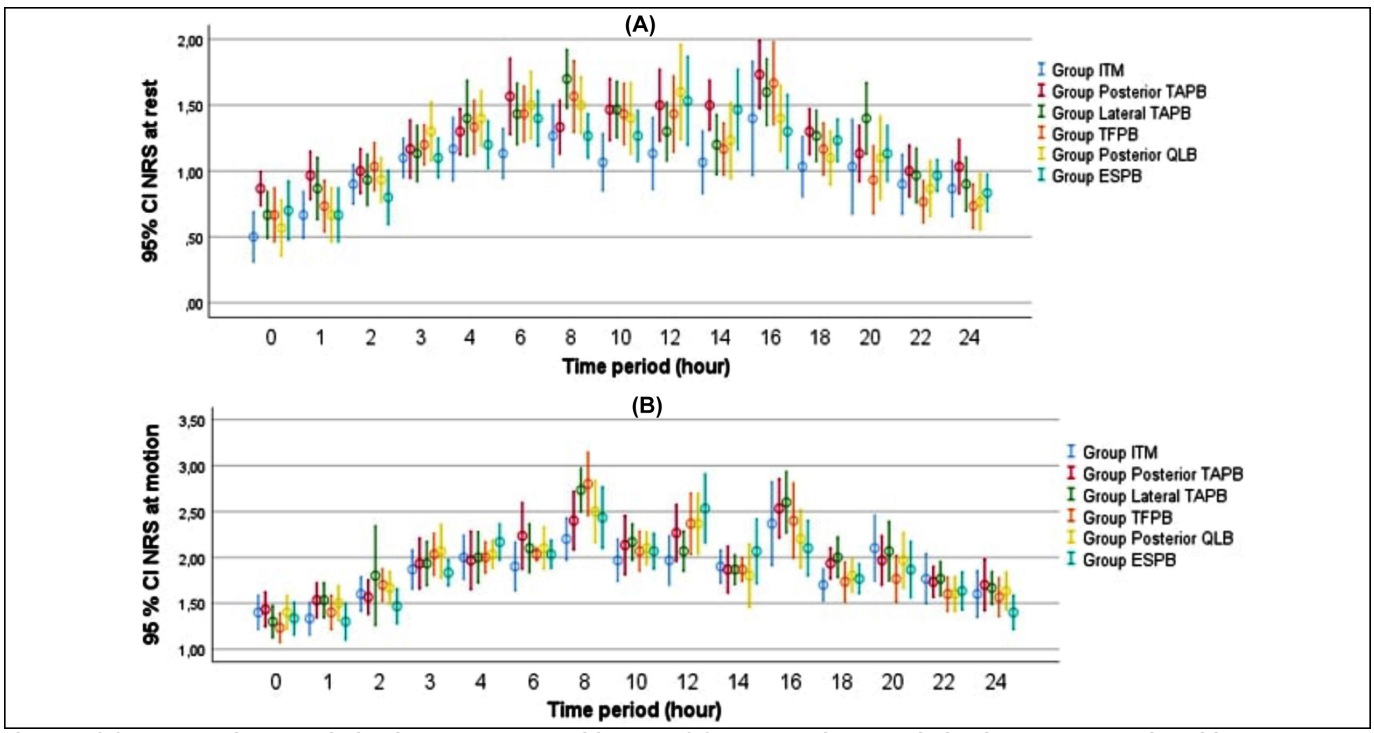

Figure 2: (A) Postoperative numerical rating scores at rest with 95% CI (B) Postoperative numerical rating scores at motion with 95% CI.

Postoperatively, no significant difference was found in the mean NRS scores at rest and during movement ($p > 0.05$ for both). Pain scores at rest increased in all groups during the first 8–10 hours post-surgery, followed by a gradual decline. Pain scores during movement peaked around the same time frame and then decreased. Although pain scores were higher during movement than at rest, no significant difference was observed between the groups in either condition (Figure 2 A and B).

Postoperative rescue analgaesia was required for 162 (90%) patients, with no significant differences in overall requirements among the groups ($p = 0.192$). The lateral TAPB group exhibited significantly higher total morphine consumption over the 24-hour period, with 30 patients (100%) receiving morphine, compared to the posterior TAPB group (28 patients, 93.3%), posterior QLB group (25 patients, 83.3%), ESPB group (28 patients, 93.3%), TFPB group (26 patients, 86.7%), and ITM group (25 patients, 83.3%) ($p = 0.009$).

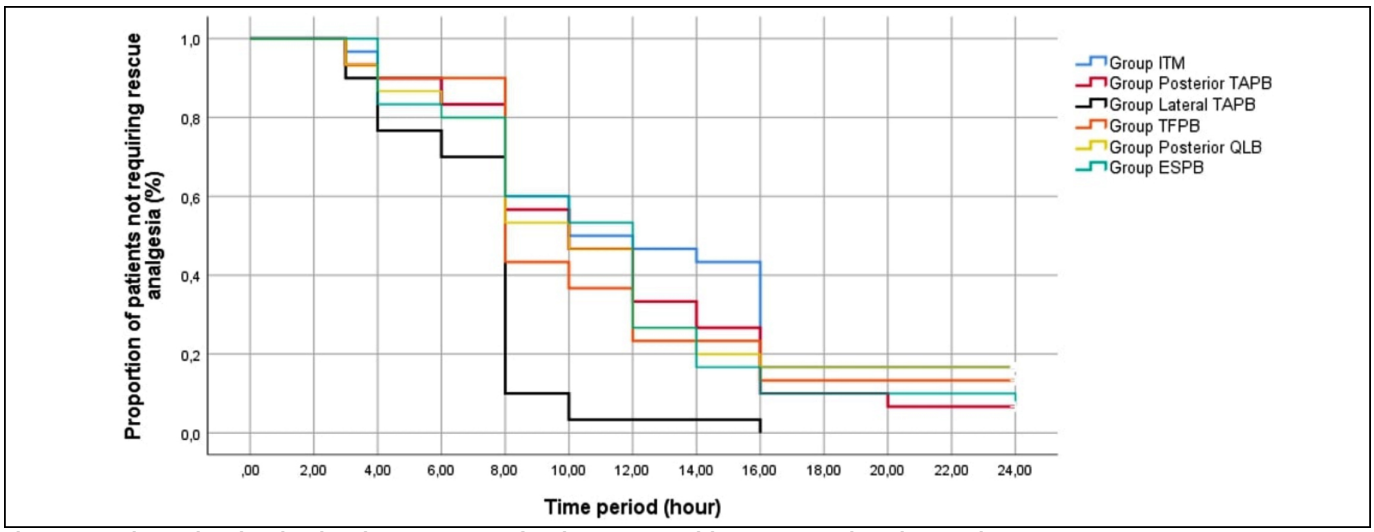

Figure 3: Kaplan-Meier plot showing the percentage of patients not requiring rescue analgaesia over time.

The median morphine amounts administered were as follows: 8 (4–9) mg in lateral TAPB, 4 (3–7) mg in posterior TAPB, 4 (3–8) mg in posterior QLB, 4 (4–7) mg in ESPB, 4.5 (3–7) mg in TFPB, and 4 (3–8) mg in ITM, with the morphine amount in the lateral TAPB group being significantly higher compared to that in the other groups ($p = 0.009$).

The median time for administering rescue analgaesics across groups was as follows: 10.0 (3.56–16.44) hours (median (95% CI) in group ITM, 10.0 (6.94–13.06) hours (median (95% CI) in group posterior TAPB, 8.0 (7.64–8.36) hours (median (95% CI) in group lateral TAPB, 8.0 (6.48–9.52) hours (median (95% CI) in group TFPB, 10.0 (7.99–12.01) hours (median (95% CI) in group posterior QLB, and 12.0 (10.10–13.89) hours (median (95% CI) in group ESPB. Patients in the lateral TAPB group requested analgaesia earlier compared to other groups; this difference was significant ($p <0.05$) (Figure 3). However, an analysis of rescue analgaesic utilisation across various time intervals among the six groups revealed no significant differences at any time point (Table III).

Regarding PONV, and the need for antiemetic drugs, no significant differences were noted between the groups ($p >0.05$). However, pruritus was significantly more common in the ITM group, affecting 16.7% of the patients in this group ($p <0.001$), whereas no patients in the regional analgaesia groups experienced pruritus.

The analysis of patients' satisfaction scores regarding postoperative pain management, measured using a 5-point Likert scale, revealed no significant mean score differences across the groups: 4.80 ± 0.41 in ITM group, 4.77 ± 0.43 in posterior TAPB group, 4.53 ± 0.51 in lateral TAPB group, 4.70 ± 0.47 in TFPB group, 4.60 ± 0.50 in posterior QLB group, and 4.63 ± 0.49 in ESPB group ($p = 0.217$).

Regarding 'time to first oral intake', the results were as follows: ITM group, 4.13 ± 0.43; posterior TAPB group, 4.17 ± 0.46; lateral TAPB group, 4.13 ± 0.43; TFPB group, 4.10 ± 0.31; posterior QLB group, 4.20 ± 0.55; and ESPB group, 4.10 ± 0.76. No significant difference was observed between the groups ($p = 0.972$). For 'time to first mobilisation', the findings were as follows: ITM group, 4.10 ± 0.40; posterior TAPB group, 4.03 ± 0.18; lateral TAPB group, 4.10 ± 0.31; TFPB group, 4.03 ± 0.18; posterior QLB group, 4.30 ± 0.60; and ESPB group, 4.07 ± 0.52. The differences between the groups were not significant ($p = 0.098$). Sedation scores were similar across the groups, with no patients exhibiting a sedation score of ≥2 ($p = 0.901$).

DISCUSSION

The results of the current study indicate that the impact of ITM and various regional analgaesia techniques showed no considerable differences concerning postoperative recovery quality within 24 hours following the CD, as evaluated by the ObsQoR-10. However, notable differences were observed in the lateral TAPB group, where postoperative analgaesic effectiveness appeared to have a shorter duration, and a higher cumulative opioid requirement was recorded compared to the other intervention groups.

The contribution of regional analgaesia techniques to postoperative pain management after CD is well-known. However, studies on the impact of there techniques on overall recovery quality are limited. Irwin *et al*. evaluated the analgaesic effect of posterior QLB after CD in patients who received ITM and reported no difference between the groups regarding postoperative recovery quality.[13] Dereu *et al*. compared ITM and clonidine-added posterior TAPB after CD concerning PONV incidence, antiemetic requirement, and postoperative recovery quality and showed no difference in QoR-40 scores at 24 hours.[14] Consistent with previous research, the findings in this study demonstrated that all groups exhibited similar ObsQoR-10 scores at 24 hours.

A meta-analysis concluded that combining regional analgaesia techniques with ITM does not enhance analgaesic outcomes.[15] The PROSPECT guideline recommends a single

injection of local anaesthetic infiltration, continuous wound local anaesthetic infusion or regional analgaesia techniques when ITM is not used.[16] This study's primary objective was to investigate the impact of frequently implemented regional analgaesia techniques, including lateral TAPB, posterior TAPB, posterior QLB, ESPB, and TFPB.

Regional analgaesia techniques have gained attention for their potential to alleviate postoperative pain following CD. Kanazi *et al*.'s study, comparing the effectiveness of ITM and lateral TAPB, revealed that patients receiving ITM reported significantly lower pain scores only within the initial 4 hours post-surgery.[17] However, no difference was found in pain scores after 4 hours until the 24th hour. Hamed *et al*. compared ITM to ESPB and noted that patients in the ITM group experienced more significant pain at rest than those in the ESPB group.[18] The current study found that regional analgaesia techniques showed similar effectiveness in managing the pain during rest and movement in all postoperative time points as ITM. Satisfaction may be attributed to better pain alleviation, even while the type of anaesthesia and pain treatment approaches had no direct influence.[19] Patients in all groups exhibited high satisfaction levels, probably because of the effective postoperative pain relief these techniques provide.

Local anaesthetics typically provide pain relief lasting 9-12 hours. In a meta-analysis of the postoperative analgaesic effectiveness of peripheral nerve blocks by Ryu *et al*., ESPB emerged as the most effective in prolonging the time until the initial request for analgaesia.[20] The ESPB group exhibited a longer median duration before the first analgaesic request than the other groups. The efficacy of the TAPB groups showed similar pain relief compared to the ITM groups. However, the lateral TAPB approach group exhibited a significantly shorter duration before the initial request for analgaesia and higher overall opioid consumption. Although TAPB groups showed similar analgaesic efficacy as the ITM group, a significantly shorter duration before the initial request for analgaesia and higher overall opioid consumption in the lateral TAPB approach group can be attributed to anatomical differences; hence, the injection point plays a central role in local anaesthetic administration. By the posterior approach, the local anaesthetic more significantly spread into the paravertebral space, providing better analgaesic efficacy than the lateral approach.[21] Single-shot nerve blocks may not effectively manage later postoperative pain around the 24-hour mark; thus, continuous infusion of local anaesthetics through a catheter is recommended to treat prolonged pain.[20]

Neuraxial morphine is associated with adverse effects, including pruritus, PONV, and delayed respiratory depression. PONV is a common side effect, occurring in up to 30% of patients.[22] The current study observed moderate to severe PONV in 16.7% of patients in the ITM group. Preoperative administration of ondansetron could result in a lower incidence of PONV compared to the reported rates. Additionally, five patients required treatment for pruritus, whereas none experienced delayed respiratory depression.

Using ultrasound guidance during regional analgaesia procedures notably reduced the incidence of adverse events.[23] Nevertheless, case reports have highlighted several complications associated with these block applications.[24,25] Moreover, owing to the progressive physiological changes associated with pregnancy, peripartum women are at a higher risk for local anaesthetics systemic toxicity. Although no complications were observed in any block type, potential risks should be recognised when employing regional analgaesia techniques.

The lack of randomisation in the research design presents a significant limitation, potentially introducing selection bias and confounding variables, which could affect the accurate interpretation of the study outcomes. Although an independent investigator collected the data, participants' awareness of their assigned intervention was a limitation. Nevertheless, this study contributes valuable insights into the association between analgaesia techniques and recovery quality. Future research, especially randomised controlled trials, should clarify the relationship and provide more robust evidence. As the spinal anaesthetic's residual sensory block may last for hours after surgery, verifying the success rate of regional analgaesia procedures and sensory distribution was challenging. Furthermore, the limited availability of data regarding the effectiveness of regional analgaesia procedures in enhancing the postoperative recovery quality after CD hindered comparisons with other research outcomes.

CONCLUSION

Regional analgaesia procedures following CD showed comparable postoperative recovery quality, patient satisfaction, and pain relief compared to ITM. This demonstrates that these approaches could be incorporated into the multimodal analgaesia strategy as an alternative to ITM in functional recovery after CD. However, higher morphine consumption was observed in the lateral TAPB group, indicating potential differences in analgaesic requirements among regional analgaesia techniques. Additionally, pruritus was a notable concern in the ITM group. Future studies should focus on personalised regional analgaesia approaches evaluating the analgaesic and overall recovery outcomes beyond 24 hours, while addressing specific adverse effects such as pruritus and opioid consumption.

ETHICAL APPROVAL:

This prospective observational study received approval from the Ethics Committee of University of Health Sciences Hamidiye, Faculty of Medicine (Approval Number: 21/548, Approval Date: 27 August, 2021). The study was registered in the Clinical Trial database under the registration number NCT05181358.

PATIENTS' CONSENT:
Written informed consent was taken from all the patients.

COMPETING INTEREST:
The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:
MSA, MY: Contributed to data collection, drafted the introduction and discussion, conducted the related literature search, and edited the references.
NGK, MST: Contributed to the conception and study design, provided critical evaluation, conducted the statistical analysis, and contributed to the conclusion.
BK: Contributed to the material and methods section, discussion section, and interpreted the data.
All authors approved the final version of the manuscript to be published.

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