

# The Role of Tab Block Anesthesia in Enhancing Patient Quality of Life: Findings from a Cross-Sectional Study in Iraq

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## ARTICLE INFO

### Keywords:

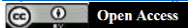
Transversus Abdominis Plane Block, Tab Block Anesthesia, Regional Anesthesia and Quality of Life.

Vol. 01, No. 04, 2026

<https://doi.org/10.5281/zenodo.23008107>

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## ABSTRACT

The transversus abdominis plane (TAP) block has gained popularity as a technique of multimodal analgesia in the post-surgical setting. The goal of this cross-sectional study was to investigate whether TAP block has an impact on postoperative pain, opioid consumption, complications, and Quality of Life (QoL) in a patient sample that underwent surgery.

The sample consisted of 105 patients who underwent elective abdominal surgery, and the study relied on two groups that were comparable in size and characteristics: the TAP block group (n = 53) and the control group (n = 52). Outcomes were reported in the study, which were related to the patients' experience during the recovery period: Visual Analog Scale (VAS) at 0, 6, 12, 24, and 48 hours; 24-hour opioid consumption; additional and pain relief medications used; nausea and vomiting; Quality of Recovery (QoR-15); final SF-36 scores and patient satisfaction; length of stay in the hospital.

According to the results of this study, the TAP Block group demonstrated considerably lower pain levels from the 6th hour of observation, lower consumption of opioids over the 24 hours (almost half compared to the control group), fewer requests for additional analgesia, improved scores on QoR-15 and SF-36 (physical component) on the 30th day, shorter time of stay in the hospital, and higher indexes of patient satisfaction. The independent predictors of favorable composite qualitative outcome in the adjusted logistic model (pseudo-R<sup>2</sup> = 0.41) were a higher QoR-15 score on the 30th day and absence of PONV instead of belonging to the TAP Block group.

## Introduction

Abdominal surgery is marked by the presence of postoperative pain, which is one of the most serious issues in the field of perioperative medicine (1). The presence of moderate to severe pain is associated with mobility limitations for the first 24 to 48 hours after the surgery, as well as increased duration of stay in hospital, risk of other complications including development of pulmonary and thromboembolic disorders, and development of chronic postoperative pain (2 – 4).

Given that postoperative pain has been traditionally being managed through the use of systemic opioids, despite opioids' ability to provide efficient analgesic relief to patients, it is important to remember that the use of this pain relief method is associated with a large number of various negative effects such as nausea, vomiting, sedation, respiratory depression and paralytic ileus (5). Negative consequences of using opioids have not only a negative effect on the comfort of the patients but also prevent them from returning to normal bowel function and commence walking again after surgery (6).

This regional approach, known as the Transversus Abdominis Plane (TAP) block, has become a valued means of alleviating pain in the post-operative period after abdominal operations. First performed

in the early 2000s but later improved by ultrasound guidance, the TAP block serves to inject the anesthetic in the neurofascial space between the internal oblique and transversus abdominis muscles where thoracolumbar nerves (T6-L1) travel to innervate the anterior wall of the abdomen (7 – 9). By interrupting the afferent somatic signals from this region of the body, the TAP block prevents pain signals that are responsible for the pain at the surgical site after laparoscopic cholecystectomy, hysterectomy, colorectal surgery, and appendectomy (10). The appeal of the TAP block does not only lie in the effectiveness of analgesia that it provides but also in its side effects, which are minimal. It helps to avoid some of the complications that might be caused by a regionally administered medicine due to the fact that it targets a specific anatomical plane (11).

TAP block has been shown in previous studies to alleviate pain and decrease the need for opioid administration. Nonetheless, these studies are limited in scope as they typically focus on specific metrics, rather than considering the entire recovery process, which entails various parameters: patients do not regard recovery as simply a progression of scores, but rather as a complex phenomenon with many facets, including physical condition, emotional wellbeing, sleep quality, return to normal activities, and satisfaction with the surgery. Quality of life (QoL) constructs serve to encompass this wider dimension of recovery from surgery (12, 13).

### Patients and Method

A cross-sectional study comprising 105 patients was conducted for elective abdominal surgery. The structure of this study contrasts with TAP Block, which entails receiving a TAP block before making any cuts.

As per the rules set forth for inclusion and exclusion of patients, a total of 105 patients (53 in TAP Block and 52 in Control) who are above the age of 23 years and undergoing elective laparoscopic cholecystectomy, open abdominal hysterectomy, colorectal resection, and appendectomy are ASA physical status group I-III patients.

Patients will be excluded in case they are suffering from a, chronic opioid usage or tolerance; allergic reaction to amide local anesthetics; being affected by a local infection near the site of incision where the infusion of medication takes place; and suffering from any bleeding disorder.

The TAP Block method entails performing a TAP block that uses ultrasound imaging to guide the physician through the entire process that is done before the making of an incision.

The main outcome tested was post-operative pain (0–10 VAS) measured at 0, 6, 12, 24, and 48 hours post-operatively. Other outcomes looked at were 24-hour opioid usage (morphine-milligram equivalent), number of patients needing rescue analgesia (yes/no), nausea and vomiting (yes/no), quality of recovery (QoR-15) at 24 hours and 30 days, quality of life (SF-36 PCS and MCS) at 30 days, patient satisfaction (Likert scale), and length of hospital stay. The binary composite good quality of life outcome was defined for logistic regression analysis to validate an overall satisfactory recovery at Day 30.

### Results

Table 1. Baseline demographic features into the 105 patients in the cross-sectional study.

| Characteristic                     | TAP Block (n=53) | Control (n=52) | p-value |
|------------------------------------|------------------|----------------|---------|
| Age, years (mean ± SD)             | 46.9 ± 9.4       | 45.8 ± 10.0    | 0.568   |
| BMI, kg/m <sup>2</sup> (mean ± SD) | 26.2 ± 3.8       | 27.5 ± 3.5     | 0.056   |
| Sex, n (%) — Female                | 29 (54.7%)       | 27 (51.9%)     | 0.927   |
| — Male                             | 24 (45.3%)       | 25 (48.1%)     |         |
| ASA class, n (%) — I               | 16 (30.2%)       | 18 (34.6%)     | 0.174   |
| — II                               | 30 (56.6%)       | 21 (40.4%)     |         |



|                                            |            |            |       |
|--------------------------------------------|------------|------------|-------|
| — III                                      | 7 (13.2%)  | 13 (25.0%) |       |
| Surgery type, n (%) — Lap. cholecystectomy | 19 (35.8%) | 17 (32.7%) | 0.895 |
| — Open hysterectomy                        | 11 (20.8%) | 14 (26.9%) |       |
| — Colorectal resection                     | 15 (28.3%) | 13 (25.0%) |       |
| — Appendectomy                             | 8 (15.1%)  | 8 (15.4%)  |       |

Table 2. Evaluation of the pain scores postoperatively.

| Time points    | TAP Block, mean $\pm$ SD | Control, mean $\pm$ SD | p-value |
|----------------|--------------------------|------------------------|---------|
| 0 h (baseline) | 7.20 $\pm$ 0.92          | 7.05 $\pm$ 0.94        | 0.403   |
| 6 h            | 4.73 $\pm$ 1.22          | 5.94 $\pm$ 1.34        | <0.001  |
| 12 h           | 3.72 $\pm$ 1.36          | 5.36 $\pm$ 1.47        | <0.001  |
| 24 h           | 3.19 $\pm$ 1.40          | 5.00 $\pm$ 1.59        | <0.001  |
| 48 h           | 2.72 $\pm$ 1.47          | 4.66 $\pm$ 1.60        | <0.001  |

Table 3. Assessment of post-operative health-related quality of life in the 105 patients.

| Outcome                   | TAP Block mean $\pm$ SD | Control mean $\pm$ SD | p-value |
|---------------------------|-------------------------|-----------------------|---------|
| QoR-15, 24 h (0-150)      | 117.7 $\pm$ 12.3        | 100.6 $\pm$ 16.0      | <0.001  |
| QoR-15, Day 30 (0-150)    | 131.1 $\pm$ 13.3        | 112.9 $\pm$ 16.8      | <0.001  |
| SF-36 PCS, Day 30 (0-100) | 46.4 $\pm$ 6.1          | 39.5 $\pm$ 7.4        | <0.001  |
| SF-36 MCS, Day 30 (0-100) | 47.3 $\pm$ 6.4          | 45.4 $\pm$ 9.1        | 0.220   |
| Length of stay, days      | 2.6 $\pm$ 0.8           | 3.1 $\pm$ 1.3         | 0.029   |

Table 4. Enrollment clinical outcomes in the postoperative period.

| Outcome                                          | TAP Block (n=53) | Control (n=52) | p-value |
|--------------------------------------------------|------------------|----------------|---------|
| Opioid use, 24 h, mg morphine                    | 14.2 $\pm$ 4.8   | 27.6 $\pm$ 6.8 | <0.001  |
| Rescue analgesia required, n (%)                 | 10 (18.9%)       | 31 (59.6%)     | <0.001  |
| PONV, n (%)                                      | 10 (18.9%)       | 16 (30.8%)     | 0.235   |
| Patient satisfaction, 1-5 Likert (mean $\pm$ SD) | 4.4 $\pm$ 0.7    | 3.3 $\pm$ 1.1  | <0.001  |

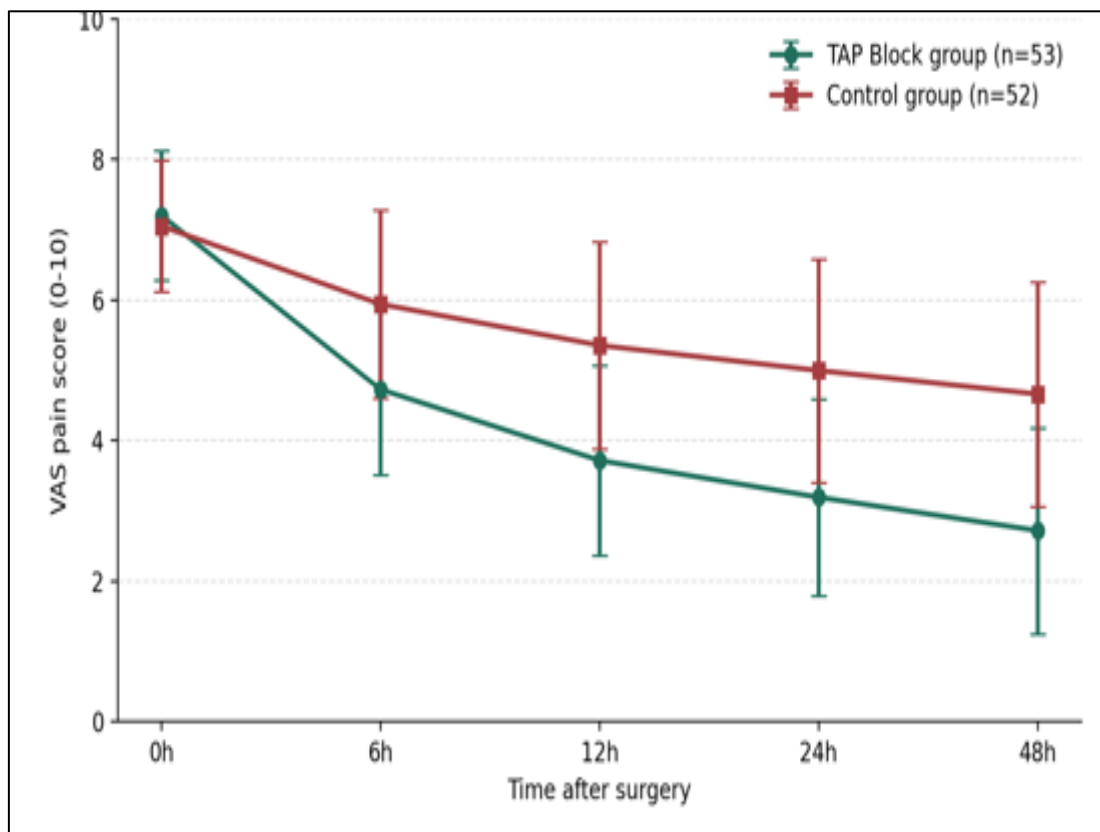


Figure 1: Figuring out the postoperative pain scores during the first 48 hours.

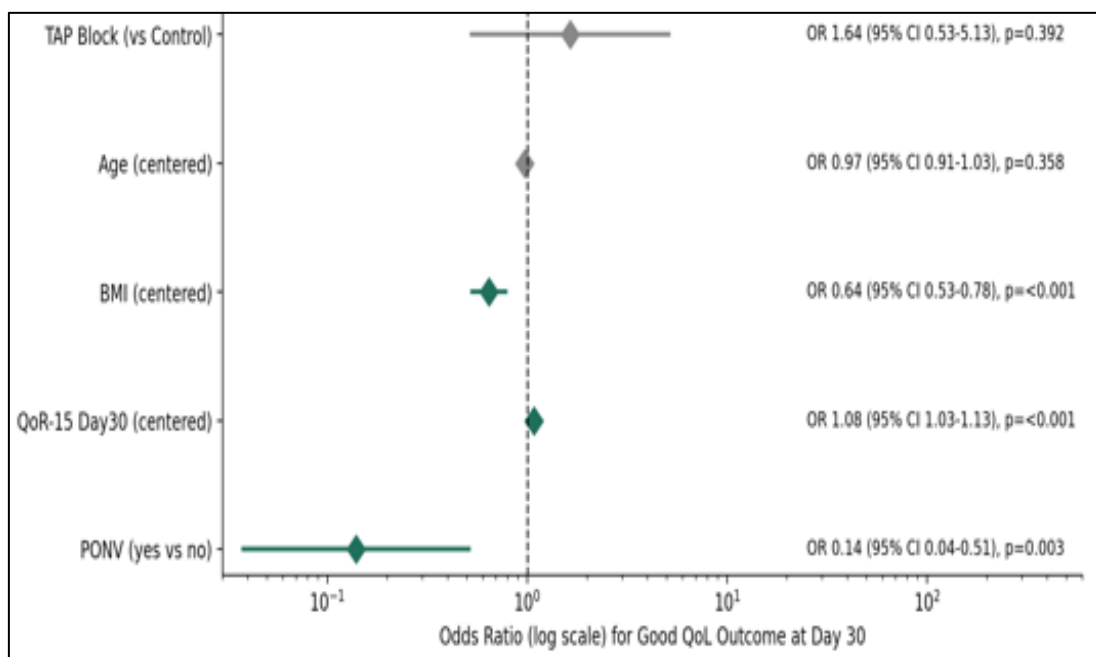


Figure 2: Logistic regression analysis in the prediction of improvement in quality—of—life indicators.

## Discussion

The TAP block group exhibited significantly lower Visual Analogue Scale (VAS) pain scores starting from 6 hours postoperatively and throughout the next 48 hours.

This coincided with the observed drop in rescue analgesia usage and reduction in opioid amount within the TAP block group, both of which are in line with numerous studies suggesting that TAP block operates as an opioid-sparing component as part of multimodal analgesia and ERAS protocols (14). The

degree of reduction of opioids consumed, reaching nearly 50% compared to the control group's morphine-equivalent consumption, falls within the range usually reported for other techniques utilizing peripheral nerve blocks/fascial plane blocks as adjuncts to systemic analgesia.

Sedation, complications related to opiates, and intestinal obstruction are already known obstacles to prompt rehabilitation and food intake, which play an important role in fast recovery protocols.

Quality of life information obtained is based not only on analgesic effect. Indeed, both measurement tools, QoR-15 and SF-36 physical component summary, demonstrate statistically significant results in favor of the TAP block surgeons group at first and on the 30th day, respectively. It indicates that the positive impact of regional anesthesia, if it works according to the model used, is present not only during the immediate perioperative period but also during the whole recovery process (15, 16).

No significant differences in the mental component of SF-36 between the patients receiving TAP block and those from the comparison group were noted - contrary to distinctions in the physical component and rehabilitation quality (17). The finding is reasonable since physical recovery domains, such as self-care and the effect of pain on one's activities, have a closer link to analgesia compared to mental health domains that are impacted by a number of factors, including anxiety about the diagnosis, social support, etc.

The model that mixed QoR-15 and day-30 nausea and vomiting with factors such as treatment group, age, and BMI showed that the parameters used for treatment group assignment was not an independent predictor of composite quality-of-life without the presence of QoR-15 and nausea and vomiting (18). TAP blocks provide their support to fast recovery of the patient without creating the separate mechanism of their influence on the quality of life of the patient (19). It should be mentioned that analgesic techniques usually influence the global outcomes of surgery using pain, nausea, and opioid burden, and not a mechanism that is isolated from all others.

After making adjustments, it was established that higher BMI corresponds to lower chances that patients will achieve satisfactory quality-of-life outcomes. This is the conclusion that corresponds to the findings of many surgeries that state that higher BMI influences the speed of recovery and leads to more complications (20 – 22). This fact indicates that regional anesthesia methods cannot fully compensate for the recovery burden connected with certain risk factors in patients.

## Conclusion

This study was done on 105 patients, and the advantages of TAP block anesthesia were uniform during the acute and sub-acute postoperative period, evidenced by postoperative 6-hour pain scores, decrease in opioid drug consumption and requirement of rescue analgesia at the same time, increase in the quality of recovery and functioning scores on the 30th postoperative day, decrease in length of stay in the hospital, and increase patient satisfaction compared to systemic analgesia alone. When analyzed to determine whether the benefits occur because of improved recovery quality or because of changes in life quality as a result of recovery, multivariable logistic analysis found that most benefits are a result of improvement in recovery quality rather than changes in life quality following recovery.

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