

## Case Report

# Determining Morphine Requirement Post Cesarean Section with and without TAP Block- A Retrospective Chart review

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**Abstract**

The transversus abdominis plane (TAP) block is an effective method of providing postoperative analgesia for patients undergoing midline abdominal wall incisions. We evaluated retrospectively, the analgesic efficacy of an ultrasound guided TAP block for post CS analgesia to determine if it would reduce patient-controlled analgesia (PCA) morphine consumption in the first 24 h after surgery.

**INTRODUCTION**

Childbirth via caesarean section (CS) may result in significant post-operative pain. An analgesic modality with a minimal side effect profile is desirable to achieve early mobility, facilitate maternal bonding with the newborn, and prevent the development of chronic pain. Although Intrathecal morphine is the standard, when given as part of spinal anesthesia, it can be associated with nausea and pruritus, which may affect the quality of maternal recovery. The major concern for intrathecal morphine, however, is delayed-onset respiratory depression. Hence, ASA recommends all patients receiving neuraxial opioids should be monitored for adequacy of ventilation, oxygenation, and level of consciousness [1].

Transversus Abdominis Plane (TAP) block produces sensory blockade of the abdominal wall, making it an ideal mode of post-operative analgesia for patients undergoing CS. The TAP block anesthetizes the sensory nerve supply of the anterolateral abdominal wall. In the TAP block, the T7-12 intercostal nerves, ilioinguinal nerve, iliohypogastric nerve, and the lateral cutaneous branches of the L1-3 dorsal rami are anesthetized with an injection of local anesthetic in the fascial plane between the internal oblique abdominal muscle (IOAM) and the transverse abdominal muscle (TAM). Clinical trials of the single shot posterior TAP block have shown a significant reduction in morphine consumption during the first 24-48 hours after surgery [2]. Compared to neuraxial opioid analgesia, this block

has a number of advantages, including technical simplicity, high analgesic effectiveness, opioid sparing, long duration (24 - 48 hours) and minimal side effects [3-5].

The purpose of this study was to assess the analgesic efficacy of ultrasound guided TAP block for post CS analgesia and to determine if it would reduce patient-controlled analgesia (PCA) morphine consumption in the first 24 h after surgery.

**METHOD**

After obtaining IRB approval, we conducted a retrospective electronic chart review of ASA II parturients, 18 years or older, undergoing scheduled C-section. The cohort was divided into 2 groups: PCA Group (N=20) and PCA + TAP Group (N=23). All parturients had spinal anesthesia with 12 mg of hyperbaric 0.75% bupivacaine and 15µg fentanyl. The TAP group received 20cc of Bupivacaine 0.2% on each side of the abdominal wall in the midaxillary line just superior to the iliac crest, upon arrival to the recovery room. All blocks were performed under ultrasound guidance by senior anesthesia residents who were supervised by Obstetric Anesthesiology faculty. Post-operative analgesia consisted of morphine PCA and ketorolac 30mg IV as required. The primary outcome measure was total PCA morphine requirement 24 h after surgery to achieve a desired (VAS) visual analog pain score of 3 or less. The total amount of morphine consumed in the first 24 hours post CS by each patient in the study was collected from the electronic medical record; mean and standard deviation

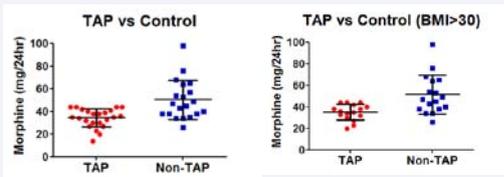


Figure 1

for each group were calculated. The two groups were compared for mean consumption of morphine using the unpaired *t*-test for independent groups. A quick glance at the data showed that over 80% of the patients whose data were analyzed had a BMI > 30. Hence, we looked specifically at the patient population with a BMI > 30 as a subgroup. We hypothesized that TAP block would be useful in this population because of the increased risk of complications with intrathecal morphine in this group.

## RESULTS

There were no differences in age, sex, or the American Society of Anesthesiologists (ASA) classification between the groups. The sample size was adequate to detect a difference in PCA morphine use between the groups with a significance level of  $p < 0.05$  and a power of 0.8. Differences in PCA morphine consumption was tested using the unpaired *t*-test.

The mean  $\pm$  SD of total PCA morphine consumption for the TAP group was  $34.35 \pm 1.699$  (N=23) and for the non-TAP group  $50.10 \pm 3.882$  (N=20). We observed over 30% reduction in morphine usage for those who received the TAP block. The *p*-value from the *t*-test was 0.0004. The mean  $\pm$  SD of total PCA morphine consumption for the BMI >30

selected TAP groups was  $35.00 \pm 1.835$  (N=16) and for the non-TAP group  $51.29 \pm 4.407$  (N=17). The *p*-value from the *t*-test was 0.0022, showing again a significant reduction in PCA morphine use in this population. There were no complications noted following the TAP block. The limitation to this study is the reliance on electronic medical records to capture retrospective data.

## DISCUSSION

TAP blocks have been described as an effective component of multimodal postoperative analgesia for a wide variety of abdominal procedures. Recent literature demonstrates the efficacy of TAP blocks by highlighting some combination of reduced postoperative opioid requirement, lower pain scores, and/or reduction in opioid-related side effects.

Complications of the TAP block are rare and the likelihood

of needle placement misadventures can be minimized with the proper use of ultrasound guidance. Despite a relatively low risk of complications and a high success rate using modern techniques, TAP blocks remain underutilized especially in the obstetric setting.

Chronic pain after cesarean section occurs more often than is thought. Approximately 10-15% of women having a cesarean section develop chronic pain possibly due to entrapment of lower abdominal wall nerves such as the iliohypogastric or the ilioinguinal nerves [6]. Peripheral nerve blocks have been shown to provide long-term pain reduction and may be an added benefit in this patient population [7].

In summary, this retrospective chart review demonstrates the analgesic efficacy of the US-guided TAP block after Cesarean delivery. We believe that the block should be considered in all women undergoing Cesarean delivery who have not received long-acting neuraxial opioids.

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