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Research Article

Use of Dexamethasone with Local Anaesthetic in Ultrasound-Guided Transversus Abdominis Plane Block – A Narrative Review

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Abstract

Background

The anterolateral abdominal wall can be anesthetized regionally using the transversus abdominis plane (TAP) block. Ultrasound guidance is now considered the gold standard in TAP blocks. It entails injecting a local anesthetic solution into a plane between the transversus abdominis and internal oblique muscles. Various adjuvants are being used along with local anesthetic to perform TAP block. Dexamethasone as an adjuvant to local anesthetic is being routinely used.

Aim: To investigate the efficacy of transversus abdominis plane block with dexamethasone in combination with a local anesthetic.

Methods: An extensive search of all materials related to the topic was carried out in Pubmed and Google Scholar search engines using ultrasound-guided TAP block, dexamethasone, and local anesthetic. Relevant research articles focusing on the "use of dexamethasone in local anesthetic in ultrasound-guided transversus abdominis plane block" published in the period 2008 - 2019 were included in the review. Out of 112 studies, we took 19 studies similar to the current study objectives were included in the study and analyzed.

Conclusion: Considering the hemodynamic stability, and reduced pain scores in the post-operative period, thereby reducing the requirement of rescue analgesics in the post-operative period, the addition of dexamethasone to local anesthetics is more efficient in ultrasound-guided transversus abdominis plane block.

Keywords: ultrasound; transversus abdominis plane block; dexamethasone

Introduction:

After abdominal procedures, it is common to observe that patients experience severe postoperative pain, with the anterior abdominal wall and its contents being the main sources of discomfort. Thus, Ultrasound-guided TAP (transverse abdominal plain) block has not only gained importance in anesthesia but also has become routine practice for post-operative analgesia in patients undergoing lower abdominal surgeries. The TAP block is a regional anesthesia technique that targets the sensory nerve supply of the anterolateral abdominal wall and has been shown to lessen postoperative pain and the need for analgesic consumption[1]. The advantage of ultrasound-guided TAP block over the landmark-guided technique is the direct visualization of the structures. Initially, only local anesthetics were administered in TAP blocks. Hence the introduction of an adjuvant aids in better efficacy of the block. When used with a local anesthetic, "adjuvants or additives" are medications that boost the effectiveness or strength of other medications. Adjuvants reduce the toxicity and required cumulative dose of local anesthetics by enhancing the rate of onset, the quality, and/or length of analgesia of the localized anesthesia thus resulting in a sustained and efficient anesthetic effect.

Dexamethasone can be utilized as a local anesthetic adjuvant due to its anti-inflammatory and inhibiting effects on neural discharge and nociceptor C fiber transmission[2]. It lengthens the activity of a local anesthetic when given to it. Dexamethasone is widely believed to improve the quality and longevity of peripheral nerve blocks when administered in conjunction with local anesthetics. In this review, we aim to discuss a few studies regarding the efficacy of the block after adding dexamethasone with local anesthetic in ultrasound-guided TAP block as a part of the management of postoperative pain.

Methods

An extensive search of all materials relate to the topic was carried out in Pubmed and Google scholar search engines using ultrasound guided TAP block, dexamethasone, local anaesthetic. Relevant research articles focusing on "use of dexamethasone in local anaesthetic in ultrasound guided transversus abdominis plane block" published in the period 2008 - 2019 were included in the review. Out of 112 studies, we took 19 studies similar to the current study objectives were included in the study and analysed.

Results:

A. AKKAYA et al, a randomized controlled double blinded trail evaluated 42 patients with spinal anaesthesia to determine how dexamethasone affects the length of the transversus abdominis block (TAP) when combined with levobupivacaine when administered to patients undergoing caesarean section. When comparing the dexamethasone group to the levobupivacaine group, they concluded that the amount of time before the first extra analgesic dose was administered was considerably longer in the dexamethasone group [3].

Carney J et al, In addition to standard postoperative analgesia consisting of patient-controlled morphine analgesia and regular diclofenac and acetaminophen, a randomised controlled double blinded trial evaluated 50 females undergoing elective total abdominal hysterectomy to compare the effects of TAP block with ropivacaine versus placebo. They concluded that compared to the placebo block, the TAP block with ropivacaine decreased the postoperative pain scores on the visual analogue scale upto 48 [post operative hours[4].

Mankikar MG et al, a prospective, randomized, double-blind, controlled clinical trial evaluated 60 adult patients who underwent elective cesarean section to evaluate the analgesic efficacy of TAP block with ropivacaine for 24 hours. They found that the time for rescue analgesia in the study group was prolonged and the average amount of tramadol needed in the first 24 hours was decreased.(5)

Ammar AS, Mahmoud KM et al, a prospective randomized controlled trial evaluated 60 patients undergoing elective open abdominal hysterectomy received TAP block to assess how the addition of dexamethasone to bupivacaine affects the kind and length of the block. They concluded that at two hours following surgery, the pain VAS score was much lower and the TAP block's duration was extended and the incidence of nausea and vomiting was reduced by the addition of dexamethasone to bupivacaine.6)

Rafi AN et al , has done the study on abdominal field block via the lumbar triangle: a new approach. He has performed the technique on more than 200 patients without any untoward sequelae. This new approach entails locating the abdominal muscles' neurovascular plane and administering a local anaesthetic there. He has found that this technique is very beneficial and easier approach but must be avoided in patients with lumbar hernia in which the hernial sac protrudes through the lumbar triangle.(7)

Naghipour BA et al, a prospective randomized controlled trial evaluated 72 adult patients to determine the effect of dexamethasone added to bupivacaine- fentanyl on the duration of postoperative analgesia via epidural catheterization. They concluded that the duration of analgesia was significantly lower in the Dexa group compared to the control group.(8)

Johns N et al, randomised controlled trials (RCTs) assessing the effects of TAP block on morphine use 48 hours after surgery, prevalence of postoperative nausea and vomiting (PONV), and impact on reported pain levels in 413 individuals following abdominal surgery (visual analogue scale). They came to the conclusion that Tap block lessens the need for postoperative morphine, nausea, and vomiting, as well as perhaps the intensity of pain following abdominal procedures.(9)

Siddiqui MR et al, conducted a meta-analysis study to determine the effectiveness of the tranversus abdominis plane block.86 patients in the TAP block group and 88 patients in the non-TAP block group participated in the trial. TAP block has been proven to lessen the need for postoperative opioids, lengthen the period before the first request for more analgesia, deliver more potent pain relief, and lessen the negative effects of opioid use. (10)

Weiss E et al , did a randomized controlled trial on 100 patients for the study in Nishtar hospital, Multan. All patients were given spinal anaesthesia. In group A, patients were given TAP block and Group B, were given spinal anaesthesia alone with IV tramadol 50 mg and analgesia requirement, at 12 hours postoperatively were recorded. They came to a conclusion that the use of the bilateral TAP block in patients undergoing elective cesarean delivery can reduce postoperative pain and analgesic usage for up to 24 hours. (11)

Yildiz I, 2015; 19: 285 et al, a randomized controlled trial did a study on 90 patients who had undergone elective primary unilateral open inguinal hernia repair with spinal anesthesia; post operatively, transversus abdominis plane (TAP) block was done by bupivacaine combined with 4 mg dexamethasone in (group I), 8 mg dexamethasone in (group II), or saline in (group III.) concluded that addition of 8mg dexamethasone to local anaesthetic mixture of bupivacaine in TAP block had reduced post operative pain when compared to the addition of 4mg dexamethasone to the local mixture. (12)

Glasser RS et al, Kopacz DJ et al, Mirzai H et al, Kikuchi A et al , stated that many studies were done to demonstrate safety and analgesic efficacy of corticosteroids in peripheral nerve blocks and neuroaxial blocks(13-16).

Movafegh A et al, Shrestha Br et al, Cummings KC et al, showed that dexamethasone is a good and effective adjuvant when used in peripheral nerve plexus blocks such as axillary plexus block, brachial plexus block. There was significant faster onset of action and prolonged duration of analgesia when dexamethasone is combined with local anaesthetics. (17-19).

Declaration of the author:

I declare the above article is my exclusive work. And this statement is true**.**

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Conclusion

Considering the haemodynamic stability, reduced pain scores in the post operative period, thereby reduced requirement of rescue analgesics in the post operative period, the addition of dexamethasone to local anaesthetics is more efficient in ultrasound guided transversus abdominis plane block.

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