



REVISTA BRASILEIRA DE ANESTESIOLOGIA

Publicação Oficial da Sociedade Brasileira de Anestesiologia
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SCIENTIFIC ARTICLE

Ultrasound-guided transversus abdominis plane block in patients undergoing laparoscopic cholecystectomy: comparison of efficacy of bupivacaine and levobupivacaine on postoperative pain control



Arzu Yıldırım Ar^{a,*}, Dilek Erdoğan Arı^a, Yıldız Yiğit Kuplay^a, Yalın İşcan^b,
Firdevs Karadoğan^a, Damla Kırım^a, Fatma Nur Akgün^a

^a Fatih Sultan Mehmet Educational and Research Hospital, Anesthesiology and Reanimation Department, Istanbul, Turkey

^b Fatih Sultan Mehmet Educational and Research Hospital, General Surgery Department, Istanbul, Turkey

Received 18 July 2017; accepted 11 February 2018

Available online 17 March 2018

KEYWORDS

Bupivacaine;
Cholecystectomy;
Laparoscopic surgery;
Levobupivacaine;
Postoperative
analgesia

Abstract

Background and objective: The use of transversus abdominis plane block with different local anesthetics is considered as a part of multimodal analgesia regimen in laparoscopic cholecystectomy patients. However no studies have been published comparing bupivacaine and levobupivacaine for transversus abdominis plane block. We aimed to compare bupivacaine and levobupivacaine in ultrasound-guided transversus abdominis plane block in patients undergoing laparoscopic cholecystectomy.

Methods: Fifty patients (ASA I/II), undergoing laparoscopic cholecystectomy were randomly allocated into two groups. Following anesthesia induction, ultrasound-guided bilateral transversus abdominis plane block was performed with 30 mL of bupivacaine 0.25% in Group B ($n=25$) and 30 mL of levobupivacaine 0.25% in Group L ($n=25$) for each side. The level of pain was evaluated using 10 cm visual analog scale (VAS) at rest and during coughing 1, 5, 15, 30 min and 1, 2, 4, 6, 12 and 24 h after the operation. When visual analogue scale > 3 , the patients received IV tenoxicam 20 mg. If visual analogue scale remained > 3 , they received IV tramadol 1 mg.kg⁻¹. In case of inadequate analgesia, a rescue analgesic was given. The analgesic requirement, time to first analgesic requirement was recorded.

Results: Visual analogue scale levels showed no difference except first and fifth minutes post-operatively where VAS was higher in Group L ($p < 0.05$). Analgesic requirement was similar in both groups. Time to first analgesic requirement was shorter in Group L (4.35 ± 6.92 min vs. 34.91 ± 86.26 min, $p = 0.013$).

* Corresponding author.

E-mail: dr.arzuyildirim@hotmail.com (A. Yıldırım Ar).

PALAVRAS-CHAVE

Bupivacaína;
 Colectistectomia;
 Cirurgia
 laparoscópica;
 Levobupivacaína;
 Analgesia
 pós-operatória

Conclusions: Bupivacaine and levobupivacaine showed similar efficacy at TAP block in patients undergoing laparoscopic cholecystectomy.

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Bloqueio do plano abdominal transversal guiado por ultrassom em pacientes submetidos à colecistectomia laparoscópica: comparação da eficácia de bupivacaína e levobupivacaína no controle da dor pós-operatória

Resumo

Justificativa e objetivo: O uso do bloqueio do plano transversal abdominal com diferentes anestésicos locais é considerado como parte do regime de analgesia multimodal em pacientes submetidos à colecistectomia laparoscópica. No entanto, nenhum estudo comparando bupivacaína e levobupivacaína para bloqueio do plano transversal abdominal foi publicado. Nosso objetivo foi comparar bupivacaína e levobupivacaína em bloqueio do plano transversal abdominal guiado por ultrassom em pacientes submetidos à colecistectomia laparoscópica.

Métodos: Cinquenta pacientes (ASA I/II), submetidos à colecistectomia laparoscópica foram alocados aleatoriamente em dois grupos. Após a indução da anestesia, o bloqueio do plano transversal abdominal bilateral guiado por ultrassom foi realizado com 30 mL de bupivacaína a 0,25% no Grupo B ($n = 25$) e 30 mL de levobupivacaína a 0,25% no Grupo L ($n = 25$) para cada lado. O nível de dor foi avaliado usando a escala visual analógica de 10 cm em repouso e durante a tosse em 1, 5, 15, 30 minutos e em 1, 2, 4, 6, 12 e 24 horas após a operação. Quando a escala visual analógica > 3 , os pacientes receberam 10 mg de tenoxicam por via intravenosa (IV). Se a escala visual analógica permanecesse > 3 , os pacientes recebiam tramadol IV ($1 \text{ mg} \cdot \text{kg}^{-1}$). Em caso de analgesia inadequada, um analgésico de resgate foi administrado. A necessidade de analgésico e o tempo até a primeira solicitação de analgésico foram registrados.

Resultados: Os escores da escala visual analógica não mostraram diferença, exceto no primeiro e quinto minutos de pós-operatório, onde a escala visual analógica foi maior no Grupo L ($p < 0,05$). A necessidade de analgésico foi semelhante em ambos os grupos. O tempo até a primeira solicitação de analgésico foi menor no Grupo L ($4,35 \pm 6,92 \text{ min vs. } 34,91 \pm 86,26 \text{ min}$, $p = 0,013$).

Conclusões: Bupivacaína e levobupivacaína apresentaram eficácia similar no bloqueio TAP em pacientes submetidos à colecistectomia laparoscópica.

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Introduction

Although laparoscopic cholecystectomy is a minimally invasive procedure, moderate level pain is observed in the early postoperative period, especially in the first 24 h due to various reasons.^{1,2} Management of the postoperative pain is important as it increases the length of stay in the hospital and the risk of morbidity. Multimodal analgesia management is utilized for pain observed in the postoperative period. For this purpose, Nonsteroidal Anti-Inflammatory Drugs (NSAIDs), paracetamol, opioids, gabapentinoids and other similar medications are utilized. Transversus Abdominis Plane (TAP) block is accepted as another constituent of multimodal analgesia.^{3,4} Use of opioids, a traditional mode of treatment for pain management, is restricted by nausea, vomiting, constipation, urinary retention, sedation and resulting respiratory depression.³ Thoracic epidural analgesia for postoperative pain has been found to be more effective than patient controlled intravenous analgesia,

however epidural anesthesia is associated with risks of dural puncture, high level epidural block, epidural hematoma, and epidural infection.⁵ Precaution should also be taken with NSAID use due to possible side effects in elderly patients, patients with renal, cardiac, hematopoietic and liver failure, and in patients with positive history of gastrointestinal bleeding.⁶

Currently transversus abdominis plane block is used for the management of pain in the postoperative period after various surgical procedures, namely open/laparoscopic appendectomy, cesarean section, total abdominal hysterectomy, laparoscopic cholecystectomy, open prostatectomy, renal transplantation, and abdominoplasty among others.^{1,4,7-9} Hebbard et al. later described ultrasound guided TAP block in 2007.¹⁰ The use of ultrasound imaging allows correct localization of injection site and visualization of local anesthetic distribution, thereby leading to increased success and reduced complication rate.¹⁰ A considerable amount of studies show TAP block to be a good

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