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SCIENTIFIC ARTICLE

Efficiency of bupivacaine and association with dexmedetomidine in transversus abdominis plane block ultrasound guided in postoperative pain of abdominal surgery

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KEYWORDS
Dexmedetomidine;
Bupivacaine;
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Abstract
Background and objectives: We aimed to evaluate the effect of bupivacaine and dexmedetomidine added to bupivacaine used in tranversus abdominis plane (TAP) block on postoperative pain and patient satisfaction in patients undergoing lower abdominal surgery.
Methods: Lower abdominal surgery was enrolled in the study. After anesthesia induction, ultrasound guided TAP block was performed. TAP block was obtained with 21 mL 0.9% saline in Group C ($n = 31$), 20 mL 0.5% bupivacaine + 1 mL saline in Group B ($n = 31$), and 20 mL 0.5% bupivacaine + 1 mL dexmedetomidine (100 μg) in Group BD ($n = 31$).
Results: Visual analog scale scores were lower in Group BD compared to Group C, at all time points ($p < 0.05$); it was lower in group BD than in group B at 10–24 h. In Group B, it was lower than Group C at 2–8 h ($p < 0.05$). Total morphine consumption was lower in Group BD compared to other groups and lower in group B than in the controls ($p < 0.001$). Patient satisfaction was higher in Group BD than in other groups and was higher in both study groups than in the controls ($p < 0.001$). Nausea-vomiting scores, antiemetic requirement, or additional analgesic administration were not significant among groups ($p > 0.05$).
Conclusions: The addition of dexmedetomidine to bupivacaine on TAP block decreased postoperative pain scores and morphine consumption; it also increased patient satisfaction in patients undergoing lower abdominal surgery. Dexmedetomidine did not have any effect on nausea and vomiting score and antiemetic requirement.

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PALAVRAS-CHAVE
Dexmedetomidina;
Bupivacaína;
Bloqueio do plano transverso abdominal;
Cirurgia abdominal inferior

Eficácia de bupivacaína e associação com dexmedetomidina em bloqueio do plano transverso abdominal guiado por ultrassom na dor após cirurgia abdominal

Resumo
Justificativa e objetivos: O objetivo do estudo foi avaliar o efeito de bupivacaína e dexmedetomidina adicionadas à bupivacaína para bloqueio do plano transverso abdominal (TAP) no controle da dor e satisfação do paciente após cirurgia abdominal inferior.
Métodos: Pacientes submetidos à cirurgia abdominal inferior foram incluídos no estudo. Após a indução da anestesia, o bloqueio TAP guiado por ultrassom foi realizado com 21 mL de solução salina a 0.9% no Grupo C (n = 31), 20 mL de bupivacaína a 0,5% + 1 mL de solução salina no Grupo B (n = 31) e 20 mL de bupivacaína a 0,5% + 1 mL de dexmedetomidina (100 μg) no grupo BD (n = 31).
Resultados: Os escores da escala visual analógica foram menores no Grupo BD comparado ao Grupo C em todos os tempos mensurados ($p < 0,05$); foi menor no Grupo BD que no Grupo B em 10-24 horas. No Grupo B, os escores VAS foram menores que no Grupo C em 2-8 horas ($p < 0,05$). O consumo total de morfina foi menor no Grupo BD em comparação com outros grupos e menor no Grupo B que nos controles ($p < 0,001$). A satisfação do paciente foi maior no Grupo BD que nos outros grupos e maior em ambos os grupos de estudo que nos controles ($p < 0,001$). Os escores de náusea e vômito, necessidade de antiemético ou de analgésicos adicionais não foram significativos entre os grupos ($p > 0,05$).
Conclusões: A adição de dexmedetomidina à bupivacaína em bloqueio TAP reduziu os escores de dor e o consumo de morfina no pós-operatório, além de aumentar a satisfação do paciente em pacientes submetidos à cirurgia abdominal inferior. Dexmedetomidina não apresentou efeito sobre os escores de náusea e vômito e a necessidade de antiemético.

Introduction

Open inguinal hernioplasty and open appendectomy surgery mostly cause mild to severe postoperative pain.[1–3] If not treated, postoperative pain leads to chronic pain and undesirable events ranging from patient discomfort and prolonged immobility to thrombolytic phenomenon and pulmonary complications.[4,5] Regarding chronic pain formation, postoperative pain state, and nerve injury during surgery, as well as insufficient early postoperative pain control, are among the risk factors.[4,6] Expected pain prevalence following hernia repair was determined as 54% and postoperative 2 year cumulative prevalence was found to be 30%.[7] Transversus abdominal plane (TAP), one of the peripheral nerve blocks, was reported to reduce postoperative pain following hysterectomy, colorectal surgery, appendectomy, and inguinal hernioplasty.[2,3,8–10]

TAP is located between the oblique muscles and the transverse abdominis muscles. On TAP iliohypogastric nerve lies and anterolateral abdominal wall afferent T6-L1 nerves is got blocked with blockage of this area.[1,5]

Single and continuous TAP block techs have been successfully administered for pain control in the repair of inguinal hernia.[11,12] However, the duration of single-dose administered TAP block is limited to the effect of administered local anesthetics. Addition of adjuvant to local anesthesia may prolong the block's duration.[13] Dexmedetomidine is a selective alpha-2 adrenergic agonist with both analgesic and sedative properties.[14] When administered as a perineural adjuvant, dexmedetomidine reduces initial blocking time whilst prolonging sensory and motor blockade duration.[15]

Materials and methods

Local ethics approval for the study was received (2014/37). Then the study was recorded on http://www.clinicaltrials.gov (NCT02064530). After receiving written consent from the patients, 93 ASA I–II patients aged 18–65 years were included in the study and scheduled for open appendectomy repair or inguinal hernia administrations. A placebo-controlled, randomized, prospective and triple-blinded study was carried out, and blinding was applied both to the patients and to the investigators and data collection team. Patients were excluded if they: had a history of allergy to bupivacaine and dexmedetomidine; were or may have been pregnant; had a coagulation disorder, serious cardiac and pulmonary disease; had an administration site infection; or were unable to understand the scoring system. Patients were randomized with sealed envelopes. The control group (Group C) ($n = 31$), bupivacaine group (Group B) ($n = 31$) and bupivacaine + dexmedetomidine group (Group BD) ($n = 31$) were determined. The Groups C, B, and BD were given, respectively, 21 mL 0.9% NaCl, 20 mL 0.5% bupivacaine (without epinephrine) (Bustesin® 5 mg/mL, Vem Pharmaceuticals, Ankara, Turkey) + 1 mL 0.9% NaCl solution, and 20 mL 0.5% bupivacaine (without epinephrine) and 100 μg (1 mL) dexmedetomidine (Precedex® 100 μg/mL, Meditera, ABD). None of the patients, or the investigators administrating the TAP block and carrying out the postoperative evaluation, or the surgeons performing the operation, were given information on the groups. All patients received standard general anesthesia under standard monitorization, and perioperative mean arterial pressure (MAP) and heart

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