Perineural Dexamethasone Prolongs the Duration of Combined Femoral and Sciatic Nerve Block in Lower Limb Vascular Surgeries: A Prospective Randomized Trial


The Department of Anesthesiology, Faculty of Medicine, Cairo University

Abstract

Background: Lower limb vascular surgeries are usually associated with significant postoperative pain. The widespread use of regional anesthesia, especially peripheral nerve blocks, provides effective postoperative analgesia together with considerable cardiovascular stability. Different additives have been used to prolong regional blockade. However, the results are either inconclusive or associated with side effects. The use of perineural steroids in peripheral nerve blocks is reported to augment postoperative analgesia, without evidence of adverse effects.

Methods: Fifty-six adult patients, scheduled for lower limb vascular surgery, were randomly allocated into one of the two study groups:

- Group D (Dexamethasone group): 28 patients received 20ml bupivacaine 0.5% plus 2ml (8mg) dexamethasone in each block.
- Group C (Control group): 28 patients received 20ml bupivacaine 0.5% plus 2ml normal saline 0.9% in each block.

The study aimed at detecting a significant difference, on using adjuvant perineural dexamethasone, as regards the duration of sensory and motor blockade, as the primary outcome. Other parameters were considered as secondary outcomes, including the duration of analgesia, onset of sensory and motor blockade, the duration of motor blockade, as well as changes in heart rate, arterial blood pressure, respiratory rate, and oxygen saturation.

Results: Demographic data did not show a statistically significant difference between the two studied groups. No significant difference was shown between patients of both groups, regarding sensory and motor block onset. Significant prolongation of sensory and motor blockade, as well as duration of analgesia was recorded in patients of group D, when compared to group C. Results also showed statistically significant lower postoperative pain scores in patients of the dexamethasone group when compared with the control group. The nerve block administered was successful in all patients of the studied groups. None of the patients reported any block-related complications.

Conclusion: The adjuvant use of perineural dexamethasone in combined femoral and sciatic nerve block, for patients undergoing major vascular surgeries, is associated with extended duration of sensory and motor blockade, prolonged postoperative analgesia, and reduced postoperative pain scores. Meanwhile, the onset of sensory and motor blockade was not significantly affected.

Key Words: Lower limb vascular surgeries – Dexamethasone – Sensory and motor block – Perineural – Analgesia – Postoperative pain.

Introduction

The past decade has seen a considerable increase in the use of peripheral nerve blocks (PNBs) as an anesthetic approach for a wide range of surgical procedures involving the lower limb. A number of techniques can be used to provide anesthesia, effective pain relief with a low incidence of systemic side effects, which can facilitate improved functional recovery and shortened postoperative hospital stay after major lower limb surgeries. The use of continuous peripheral nerve catheter infusions has superseded epidurals as the analgesic gold standard following some lower limb surgeries. They can extend analgesia for 48-72 hours postoperatively; avoiding problems associated with block regression and inadequate analgesia that may occur after single injection techniques. As a general rule, proximal sciatic, femoral and lumbar plexus blocks are most suitable for use in an in-patient setting [1].

The use of lower limb PNBs in vascular surgical procedures can provide multiple benefits for such high risk group of patients, as regards cardiovascular stability and decreased opioid requirements, who may also be at risk of significant postoperative pain [2,3]. However, persisting motor block is a recognized side effect of continuous nerve block
and some surgeons have concerns because it may delay patient mobilization. When planning pain relief following lower limb surgery however, consideration must be given to the frequent side effects associated with alternative forms of analgesia such as systemic opioids (postoperative nausea and vomiting, sedation and constipation) and the observation that inadequate analgesia can lead to painful restriction of limb movement [2].

Local anesthetics alone provide analgesia for not more than 4-8 hours. Increasing the duration of local anesthetic action is often desirable; because it prolongs surgical anesthesia and analgesia. Different additives have been used to prolong regional blockade. Vasoconstrictors can be used to constrict vessels, thereby reducing vascular absorption of the local anesthetic. Additives like opioids, clonidine and verapamil were added to local anesthetics, but the results are either inconclusive or associated with side effects. Steroids have powerful anti-inflammatory as well as analgesic property. Perineural injection of steroids is reported to influence postoperative analgesia [6,7]. Although they were reported to cause arachnoiditis when used intrathecally, there is no evidence suggesting any neuritis when steroids are used in low concentration in peripheral nerve blocks [8].

Hypothesis and study objective:

We hypothesized that adjuvant perineural dexamethasone would offer an additional analgesic effect to bupivacaine-induced peripheral nerve blockade, through a specific peripheral mechanism. This double-blinded, randomized, controlled study was conducted to explore the possible effect of adjuvant perineural dexamethasone, after nerve stimulator-guided combined femoral and sciatic nerve block, in patients undergoing lower limb major vascular surgery.

Patients and Methods

This prospective randomized controlled study was conducted in Cairo University Hospital (Kasr Al-Ainy), between June 2013 and January 2015, after obtaining departmental scientific and ethical committee approval. Fifty-six adult patients, aged from 18 to 70 years old, ASA physical status I-III, scheduled for lower limb vascular surgery, were included in the study after obtaining a written informed consent, including explanation of the possible advantages and potential side effects. Patients were excluded if they had any bleeding disorders, neurological deficits involving lumbar or sacral plexuses, local infection at the injection sites, history of allergy to local anesthetics, BMI above 35, or if they were on sedative, antipsychotic or anticoagulant therapy. All patients underwent systematic preoperative assessment, including history taking, physical examination, and review of the results of routine investigations.

Patients were instructed to fast for 8 hours before surgery. All patients were trained on the use of the visual analogue pain score (0-10), where zero corresponds to no pain and 10 is indicative of the worst unbearable pain.

The study was a randomized double-blinded controlled clinical trial. Patients were randomly allocated, by a computer-generated random numerical table, into one of two study groups; the randomization sequence was concealed in opaque sealed envelopes. Patients of both groups received 22ml for each of femoral and sciatic nerve blocks:

- Group D (Dexamethasone group): 28 patients received 20ml bupivacaine 0.5% plus 2ml (8mg) dexamethasone in each block.
- Group C (Control group): 28 patients received 20ml bupivacaine 0.5% plus 2ml normal saline 0.9% in each block.

This study aimed at detecting a significant difference, as regards the duration of sensory blockade (measured from the time of sensory loss until the time of its regain), on using adjuvant perineural dexamethasone, as the primary outcome. Other parameters were considered as secondary outcomes, including the duration of analgesia (measured from the time of sensory loss until the time of demand for the first dose of rescue analgesia), onset of sensory and motor blockade (the onset of sensory block was measured from the time of each block completion until the time of sensory loss in the dermatomal distribution of the blocked nerve, whereas the onset of motor blockade was measured from the time of each block completion until attaining a motor block equal to 2 or 3 on the modified Bromage scale [9] in femoral and sciatic nerve blocks, respectively), in addition to the duration of motor blockade (measured from the time of motor loss until the time of its regain). Changes in heart rate (HR), arterial blood pressure (ABP), respiratory rate, and oxygen saturation (SpO2) were also considered as secondary outcomes.

On arrival to the preparation room, a peripheral intravenous cannula (18 G) was inserted, and the patients were premedicated using 1-2mg midazolam intravenously. The patients were then transferred to the operating room where basic monitoring
(ECG, noninvasive blood pressure, and pulse oximetry) was initiated. Baseline HR, ABP, SpO₂ and respiratory rate were recorded as pre-block values. Both femoral and sciatic nerve blocks were performed using a PNS (Life-TechTM, Model ES400, Stafford, Texas, USA).

The patient was placed supine with both legs extended and the thigh is slightly abducted and externally rotated, to facilitate palpation of the femoral artery. The anterior superior iliac spine and the pubic tubercle were identified and marked. Then, a line was drawn between them (almost overlying the femoral crease); representing the inguinal ligament. The pulse of the femoral artery was palpated and marked at the inguinal crease (most superficial).

After thorough skin asepsis with 10% povidone-iodine solution and subcutaneous infiltration of 2-3ml of lidocaine 2% at the needle insertion site, a 22-gauge, short-bevel, 5-cm long, insulated stimulating needle was inserted 1-2cm lateral to the pulse of the femoral artery and 1-2cm below the inguinal ligament. The nerve stimulator was initially set to deliver 1.0mA (2Hz, 100µs). With the needle properly positioned and slowly advanced in the sagittal and slightly cephalad plane, the first response is usually that of the femoral nerve.

When a visible or palpable twitch of the quadriceps muscle “patellar twitch” was observed, the stimulating current is then gradually decreased until twitches were still seen or felt at 0.3-0.4mA (but disappearing at 0.2mA or below), which was the optimal response indicative of successful femoral nerve localization. After a negative aspiration for blood, 22ml of local anesthetic solution were slowly injected, while applying distal pressure, which allows proximal spreading of LA in the femoral sheath.

Sciatic nerve block was performed using the classic posterior approach of Labat. The patient was placed in the lateral position, where the limb to be blocked is uppermost with the foot of the upper side placed over the dependent leg, with slight hip and knee flexion. The greater trochanter and the posterior superior iliac spine (PSIS) were identified and marked, between which a line was drawn and bisected.

Under strict aseptic measures, subcutaneous infiltration of 2-3ml of lidocaine 2% was carried out at the needle insertion site. A 22-gauge, short-bevel, 10-cm long, insulated stimulating needle was inserted 4-5cm caudal to the midpoint between greater trochanter and the PSIS, at a perpendicular angle to the spherical skin plane.

After both nerve blocks were carried out, the onset and duration of sensory and motor blockade were recorded, as well as the duration of analgesia. Patients were routinely monitored, and any side effects or signs of local anesthetic toxicity were noted. HR, ABP, SpO₂ and respiratory rate were recorded every 5min. during the first 15min., and
then every 15 min. Patients were thereafter taken for surgery. Sensory and motor blockade was assessed by an independent blinded anesthetist. Postoperatively, patients were transferred to the Post-Anesthesia Care Unit (PACU) and then to the intermediate-care unit.

Patients were monitored for 24 hours following the block and data recording was continued until the first dose of rescue analgesia. If patients started to complain of pain (VAS ≥ 3) in the postoperative period, rescue analgesia was given in the form of paracetamol (Perfalgan) 1 g intravenous drip, diclofenac sodium (Voltaren) 75 mg intramuscularly, and/or pethidine 1 mg/kg intravenously, until VAS ≤ 3 cm. In case of inadequate or patchy block, general anesthesia would have been supplemented and the patient excluded from the study.

Figure (3): Surface anatomical landmarks for sciatic nerve block in Sim’s position (High posterior or Classic approach of Labat).

Statistical analysis:

Assuming that the mean duration of the sensory block of bupivacaine is 4 hours, two-tailed α error probability of 0.05 and β error probability of 0.2 (power of 80%); a total sample size of 56 patients, randomly allocated into two equal groups (28 patients each), will be required to detect a presumed minimum clinically significant difference of 10% in the duration of sensory block (effect size f=0.404). Statistical power calculations were performed using computer program G*Power 3 for Windows (Franz Faul, Universität Kiel, Germany).

Collected data was presented as mean (± SD), numbers and percentages, as appropriate. Categorical variables were analyzed using Chi-square (χ²). Continuous variables were analyzed using unpaired Student’s t-test or univariate two-group repeated measures “mixed-design” analysis of variance (ANOVA) with post-hoc Dunnett’s test as appropriate. Nominal and non-normally distributed variables were analyzed using Mann-Whitney U-test.

Statistical analysis was performed using the computer program SPSS (Statistical Package for Social Sciences), Version 20, 2011. p-value < 0.05 was considered statistically significant.

Results

Fifty-six patients, who fulfilled the inclusion criteria, were enrolled in the study to receive combined femoral and sciatic nerve blocks. All enrolled patients have already completed the study. Those patients were randomly allocated into two groups, 28 patients each; group D received perineural dexamethasone plus bupivacaine 0.5%, and group C received perineural bupivacaine 0.5% alone.

Demographic data did not show a statistically significant difference between the two studied groups. About 55% of the total study population was ASA class II, as demonstrated in Table (1).

Table (1): Demographic data of the two studied groups.

<table>
<thead>
<tr>
<th></th>
<th>Group C (n=28)</th>
<th>Group D (n=28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>58±8.5</td>
<td>56±10.5</td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>21 (75%)</td>
<td>23 (82%)</td>
</tr>
<tr>
<td>Female</td>
<td>7 (25%)</td>
<td>5 (18%)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>79.4±8.7</td>
<td>82.9±6.1</td>
</tr>
<tr>
<td>ASA* classification:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>7 (25%)</td>
<td>9 (32%)</td>
</tr>
<tr>
<td>II</td>
<td>16 (57%)</td>
<td>15 (54%)</td>
</tr>
<tr>
<td>III</td>
<td>5 (18%)</td>
<td>4 (14%)</td>
</tr>
<tr>
<td>Block application time (min.):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Femoral</td>
<td>7.9±3.6</td>
<td>7.8±2.5</td>
</tr>
<tr>
<td>Sciatic</td>
<td>7.5±2.7</td>
<td>7.3±2.3</td>
</tr>
<tr>
<td>Duration of surgery (hours)</td>
<td>4.4±0.7</td>
<td>4.5±0.9</td>
</tr>
</tbody>
</table>

Data are presented as mean±SD or number of patients (percentage %).

ASA: American Society of Anesthesiologists.

Regarding sensory and motor block onset, no significant difference was shown between patients of both study groups (Table 2).

Table (2): Onset of sensory and motor blockade.

<table>
<thead>
<tr>
<th></th>
<th>Group C (n=28)</th>
<th>Group D (n=28)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensory block onset (min.):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Femoral</td>
<td>11.2±4.32</td>
<td>10.48±1.29</td>
<td>0.19</td>
</tr>
<tr>
<td>Sciatic</td>
<td>16.33±2.61</td>
<td>15.38±1.43</td>
<td>0.15</td>
</tr>
<tr>
<td>Motor block onset (min.):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Femoral</td>
<td>17.52±2.75</td>
<td>16.43±1.5</td>
<td>0.12</td>
</tr>
<tr>
<td>Sciatic</td>
<td>21.52±3.79</td>
<td>20.38±1.43</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Data are presented as mean ± SD. p<0.05 is considered statistically significant.
Delayed sensory block regression was noted in patients of group D, with a significant difference when compared to group C ($p$-value <0.001). Similar results were found as regards the motor block duration; where it was significantly prolonged in group D when compared with group C ($p$-value <0.001). Sensory and motor block durations are demonstrated in Table (3).

Table (3): Duration of sensory and motor blockade.

<table>
<thead>
<tr>
<th></th>
<th>Group C (n=28)</th>
<th>Group D (n=28)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensory block duration</td>
<td>11.1 ± 1.3</td>
<td>14.67 ± 1.7</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>(hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor block duration</td>
<td>8.23 ± 1.2</td>
<td>11.29 ± 1.5</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>(hours)</td>
<td></td>
<td></td>
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</tbody>
</table>

Data are presented as mean ± SD.

* $p$<0.05 is considered statistically significant.

When comparing the duration of analgesia following nerve block administration, a significant difference was found between group D and group C ($p$<0.001). These differences are shown in Table (4). As regards postoperative pain scores, estimated at the time of first request for an analgesic, the results showed a statistically significant difference when comparing group D and group C ($p$-value <0.001).

Perioperative hemodynamic profiles did not show significant difference between the two studied groups. While transient hypotension (a drop of the mean arterial blood pressure ≥20% of the baseline values) was noticed in 3 patients of group D (11%), it occurred in 4 patients of group C (14%). Both of which were statistically insignificant. On the other hand, hypertensive episodes (a rise of the mean arterial blood pressure ≥20% of the baseline values) were noticed in only 1 patient of each of group D (4%) and group C (4%). Both of which were not of statistical significance. None of bradycardia, desaturation, bradypnea, or tachypnea was recorded in any patient of the studied groups.

Table (4): Duration of analgesia.

<table>
<thead>
<tr>
<th></th>
<th>Group C (n=21)</th>
<th>Group D (n=21)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analgesia duration</td>
<td>13.1 ± 1.2</td>
<td>17.4 ± 1.5</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>(hours)</td>
<td></td>
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</tbody>
</table>

Data are presented as mean ± SD.

* $p$<0.05 is considered statistically significant.

The nerve blockade administered was successful in all patients of the studied groups. None of the patients of both study groups required rescue intraoperative analgesia, or postoperative analgesia in the PACU. Neither paracetamol nor declofenac sodium was indicated to be administered. None of the patients reported any block-related complications.

![Fig. (4): Comparison between the means of VAS score between the two studied groups at time of first analgesic request.](image)

**Discussion**

The use of (PNBs) in anesthesia has been a widespread anesthetic practice, for surgical procedures involving the lower limb, especially for vascular surgical procedures; providing anesthesia, effective analgesia, with cardiovascular stability; thus improving functional recovery and shortening hospital length of stay [1-3]. Increasing the duration of regional blockade is often desirable. Different additives have been tried to achieve such aim. Continuous peripheral nerve catheter infusions have also been used. However, persistent motor blockade has been usually a considerable side effect.

The effectiveness of perioperative administration of intravenous dexamethasone as an analgesic sparing regimen used to be a controversial issue over the past few years. However, we already know that intravenous dexamethasone has an analgesic effect reducing perioperative pain, and also prevents postoperative nausea and vomiting without significant side effects [10,11]. Since steroid administration has been effectively used for management of low back pain (caused by radiculopathy) and sciatica, others followed the concept and adapted the treatment, not only for epidural administration, but also for other types of neural blockade including facet joint injections [12,13]. Corticosteroids have been also successfully used to prolong the duration of local anesthetic action after epidural and peripheral nerve blockade.
In this study, we assessed the effect of adding perineural dexamethasone in patients receiving bupivacaine-induced, nerve stimulator–guided combined femoral and sciatic nerve block, as regards the onset and duration of motor and sensory block, as well as the duration of analgesia. We found that adjuvant perineural dexamethasone has extended the duration of sensory and motor blocks, with no significant difference regarding the onset of blockade. It also improved the quality of analgesia; significantly increasing its duration as well as decreasing levels of postoperative pain scores.

A similar report published by Tandoc et al.,[14] studying the effect of adding two different doses of dexamethasone, 4 and 8mg, to bupivacaine 0.5% in 90 patients undergoing shoulder surgery using interscalene BPB block. They found significantly prolonged duration of motor block and duration of analgesia, improved quality of analgesia, and lowered postoperative opioid consumption, where both doses of dexamethasone were equally effective.

The present study outcome correlates well with the work of Cummings et al.,[15] where they added dexamethasone 8mg to bupivacaine 0.5% or ropivacaine 0.5% in 218 patients undergoing shoulder surgery using interscalene block. They found that the duration of analgesia of both ropivacaine and bupivacaine was significantly prolonged; with the effect being stronger with ropivacaine. While pain scores with movement on the first postoperative day were significantly lower in both the dexamethasone groups, pain scores at rest on postoperative day 1 were significantly lower in the dexamethasone group, but only with bupivacaine (not with ropivacaine).

In accordance with Pathak et al.,[16] studying 50 patients undergoing upper extremity surgery under supraclavicular BPB, dexamethasone 8mg were added to a mixture of adrenalinized lignocaine 1.5% and bupivacaine 0.5%. The duration of analgesia and motor block was significantly prolonged, whereas no significant difference was found in the onset time of sensory and motor block.

These results are also comparable to those of Movafegh et al.,[7] who tested the effect of adding dexamethasone 8mg in axillary BPB with lidocaine 1.5%, in 60 patients scheduled for hand and forearm surgery. While the onset times of sensory and motor block were similar in the two groups, the duration of sensory and motor blockade were significantly longer in the dexamethasone group.

In contrast to results of the previous studies, Shrestha, Maharjan and Tabedar [8] found a statistically significant faster onset of action when dexamethasone was added to a mixture of lidocaine 2% and bupivacaine 0.5% in supraclavicular BPB, in 40 patients undergoing arm, forearm and hand surgeries.

A systematic review was published by Noss and his colleagues, [17] including 11 clinical trials studying the efficacy of added dexamethasone to various LA agents using brachial plexus block. They found that the effect of dexamethasone on block onset was variable with unclear clinical benefit. Five trials, in their review, have found a statistically significant reduction in latency time. However, they reported its clinical effect was modest, based on the 1.8 to 3.65 minute absolute reductions being reported.

On the other hand, a recent systematic review was carried out by Knezevic et al.,[18] and included 14 studies with a total of 1022 patients, four studies of which used bupivacaine 0.5%: [19-22] where perineural dexamethasone minimally, but significantly, delayed the onset of sensory and motor block.

A recent systematic review and meta-analysis carried out by Choi S and his colleagues,[23] has confirmed this impression by analyzing nine trials including 801 patients testing the impact of dexamethasone (4-10mg) on BPB. They reported that dexamethasone appeared to be the best method to prolong analgesia as an adjuvant over clonidine, epinephrine, or midazolam. They also insisted on the necessity to investigate the relative effects of perineural versus systemic dexamethasone administration on peripheral nerve block analgesia and establishing whether the effects can be duplicated in lower extremity PNBs [23]. A recent large retrospective study suggests a similar advantage for upper and lower limb nerve block [24].

The analgesic effect of systemically administered dexamethasone likely arises from a variety of mechanisms, including peripheral and central anti-inflammatory effects. According to their traditional theory of action, steroids bind to intracellular receptors and modulate nuclear gene transcription and protein synthesis, [7] and ultimately inhibiting the production of prostaglandins, leukotrienes, and pro-inflammatory cytokines, thus lessening the extent of pain [25-27]. However, dexamethasone produces a relatively rapid effect, which cannot be explained by the above mechanism [28].
Why dexamethasone would prolong regional anesthesia is a subject of debate. It has been reported that the steroids induce a degree of vasoconstriction, so they reduce local anesthetic absorption. A more attractive theory holds that dexamethasone increases the activity of inhibitory potassium channels on nociceptive C fibers, decreasing their activity [18]. Direct antinociceptive effects have described following local administration of steroids. The biologic half-life of dexamethasone is between 36 to 54 hours, and its effects are most apparent in the first 48 hours [29]. Although the actual mechanism of action is not fully understood, there is evidence that corticosteroids achieve pain relief by causing a reversible local anesthetic effect (decreased sensitivity of nerve roots to irritants) [30,31]. Regardless of its specific mechanism, the best evidence suggests its action is via indirect mechanisms rather than by directly inhibiting neurotransmission [32].

Indirect evidence has supported the assumption that dexamethasone acts locally; [33,34] the potent analgesic effect obtained with the perineural administration in the present study could probably be attributed to a peripheral site of action. Despite this, it remains possible although unlikely that some of the block prolongation we observed could have been obtained by intravenous injection of dexamethasone.

However, a potential advantage of perineural dexamethasone is the avoidance of undesirable side effects associated with the use of systemic dexamethasone [35,36]. Therefore, postulated systemic mechanisms of action along with theoretical safety concerns about perineural dexamethasone, have prompted the investigation of intravenous dexamethasone as an alternative to the perineural route. Some recent studies have suggested a systemic action may be responsible for the clinical effect of peripherally administered dexamethasone and that intravenous administration may give similar results [37-39].

Conclusion:

The present study demonstrated that the adjuvant use of perineural dexamethasone in combined femoral and sciatic nerve block, for patients undergoing major vascular surgeries, is associated with extended duration of sensory and motor blockade, prolonged postoperative analgesia, and reduced postoperative pain scores and postoperative analgesic requirements. Meanwhile, the onset of sensory and motor blockade was not significantly affected. None of the study participants reported any block-related complications.

Conflict of interest:

There are no conflicts of interest declared.

References


الملخص العربي

تعتبر جراحة الوريدية الدموية بالطرف السفلي من الإجراءات الجراحية المولدة التي تتطلب تسكيناً فعالاً للأمم في فترة ما بعد الجراحة.

وقد منح انتشار استخدام التخدير الموضعي - وخاصة سدة الأصباغ الوريدية - تسكن فعالة لفترة ما بعد الجراحة في ظل ثبات العلامات الجراحية وقد استخدمت العديد من الإضافات اللوئية لإطالة مدة التخدير الموضعي ولكن نتائجها كانت إما غير حاسمة أو صاحبها تأثيرات جانبية، في حين أدى استخدام الدواء الستيرويدي في سدة الأصباغ الوريدية إلى تدعيم تسكن الأمم بعد الجراحة، بدون دليل على حدوث تأثيرات معاكسة.

كان الهدف من هذه الدراسة الوعائية بهدف تأثير حقن عقار الديكساميثازون حول العصب مصاحباً لعقار الديموفاقبين المستخدم في سدة العصبين الفخذي والوركي، كمساعد في الحد من الألم ما بعد جراحة الوريدية الدموية بالطرف السفلي، وكانت النقطة الرئيسية في إثبات ما إذا كان حقن الديكساميثازون حول العصب يمكن أن يوفر تأثيراً مسكوناً إضافياً من خلال آلية طرفية مميزة. اعتبرت مدة التخدير الحسي هي النتيجة الأولية، بينما تم اعتبار فترة تسكن الأمم بعدة التخدير الحركي وتوقيت بداية التخدير الحسبي الحركي انتهاة ثانوية.

بالإضافة إلى العلامات الحيوية كالطلب وأعراض الأعراض ونسبة تشبع الدم بالإنكسين.

استوثقت ستة وخمسون طبيبًا ممارسًا بال겠습니다 للدراسة، وتم إجراء سادة العصبين الفخذي والوركي عند أمم، وتم تمرين المرضى عشوائياً إلى مجموعة من حقن الديكساميثازون حول العصب بالإضافة إلى عقار الديموفاقبين، ومجموعة التحكم باستخدام عقار الديموفاقبين منفرداً بدون استخدام الديكساميثازون.

أظهرت نتائج الدراسة أن حقن الديكساميثازون حول العصب يساعد على إطالة مدة التخدير الحسبي والحركي وكذلك يبطئ التأثير المسكن للمخدر الموضعي بعد العملية الجراحية. في المرضى الذين يتلقون سدة العصبين الفخذي والوركي باستخدام عقار الديموفاقبين، بالإضافة إلى انخفاض مستوى الألم بعد الجراحة بشكل ملحوظ، وقد اتخذت معدلات العلامات الحيوية قبل وأثناء وبعد العملية الجراحية نسبياً مماثلًا في كلا المجموعتين، بينما لم يرتفع أي من المشاركين إلى أية مضاعفات نتيجة إجراء السدة العصبية.

وإذاك يمكن أن نستنتج أن استخدام عقار الديكساميثازون بحقن حول العصب مصاحباً لعقار الديموفاقبين في سدة العصبين الفخذي والوركي، في جراحة الوريدية الدموية للطرف السفلي، يساعد على إطالة مدة التخدير الحسبي والحركي، بالإضافة إلى الحد من الألم ما بعد الجراحة من خلال امتداد فترة تسكن الأمم وتخفيف مستوى الألم بعد الجراحة، بينما لم يتأثر توازن بداية التخدير الحسبي والحركي بصورة ملحوظة.