Original Article

Effect of Dexmedetomidine Addition to Bupivacaine in Lumbar Erector Spinae Plane Block on the Duration of Postoperative Analgesia after Hip Arthroplasty A Randomized Double-Blind Controlled Study

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ABSTRACT

Background: Total hip arthroplasty (THA) can be associated with significant postoperative pain. Poor pain control can adversely affect patient's recovery.

Aim of the Work: This study was designed to evaluate the effect of dexmedetomidine addition to Bupivacaine in lumbar erector spinae plane block (L-ESPB) on duration of postoperative analgesia after THA.

Patients and Methods: This randomized, controlled, double blind study was carried out on 60 patients undergoing THA under spinal anesthesia, their age ranged between 18 and 65 years, both sexes with ASA I-III. Postoperatively, all Patients received unilateral L-ESPB on the operated side using either 30mL 0.25% plain bupivacaine (Group B) or 30mL 0.25% bupivacaine in addition to 1µg/kg dexmedetomidine (Group BD).

Results: Time of 1st rescue analgesia was delayed in group BD. Total dose of nalbuphine consumption in the first 24h was lower in group BD than group B. Pain score was lower at 8h, 12h and 16h in group BD than group B. Sedation score was similar in both groups. Heart rate and mean blood pressure readings were lower at 8h, 12h and 16h in group BD than group B. Hypotension, bradycardia and nausea and vomiting were similar in both groups.

Conclusion: The addition of dexmedetomidine to bupivacaine in L-ESPB after THA prolongs analgesia, reduces opioid consumption.

Key Words: Analgesia, Bupivacaine, Dexmedetomidine, Hip Arthroplasty, Lumbar Erector Spinae Plane Block.

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INTRODUCTION

A total hip arthroplasty (THA) is considered a major surgical operation that enhances patients' functional status and health-related quality of life. Nevertheless, even with these benefits, there is a chance that THA will cause a lot of pain following surgery[1]. A patient's recovery after THA may be negatively impacted by inadequate pain management. It may worsen rehabilitation and have a detrimental effect on a postoperative patient's early mobility, raising the risk of venous thromboembolic disease[2].

When used to control severe postoperative pain, opioids may lead to serious health risks (such as respiratory depression, which is more common in elderly). Therefore, there has been a lot of emphasis on non-opioid analgesic approaches to control pain following surgery[3]. Several regional anesthetic techniques (e.g., transversus abdominis plane blocks, pectoral nerve blocks, and brachial plexus blocks) are effective non-opioid plans to alleviate postsurgical pain[4].

Erector spinae plane block (ESPB) is an interfascial plane block that targets the dorsal and ventral branches of the spinal nerve. Under ultrasound guidance, a local anesthetic (LA) is administered between the transverse process and the deep fascia of the erector spinae muscle[5]. A series of studies showed that ESPB provides adequate results in postoperative pain control in thoracic and abdominal surgeries. An effective postoperative pain management in THA provided by lumbar ESPB (L-ESPB) at the level of L2, L3 vertebrae has been reported[6].

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The administration of intermediate and long-acting LA does not, however, prolong postoperative analgesia beyond 6–8 hours in patients with ESPB. It is particularly significant that the duration of analgesia following single-injection ESPB can be prolonged[7].

A highly selective short-acting alpha-2 agonist, dexmedetomidine has sedative, anti-anxiety, perioperative sympathetic excitation inhibition, and hypnotic properties. Dexmedetomidine may also be used as a supplement to regional anesthetics in the perioperative management of postoperative pain anesthesia[8]. Dexmedetomidine addition to brachial plexus blocks is related with a faster block start, longer block duration, greater analgesia, and a significant reduction in opioid usage, according to a meta-analysis of over 2,000 patients[9].

AIM OF THE WORK

The aim of this work is to evaluate the effect of dexmedetomidine addition to bupivacaine in L-ESPB on duration of postoperative analgesia after THA.

Ethical Considerations

Approvals of anesthesia and intensive care department and ethical committee, faculty of medicine, Ain Shams University (FMASU MS 205/2023) were obtained. An informed consent from all patients was obtained prior the initiation of the research.

PATIENTS AND METHODS

This randomized, controlled, double blind study was conducted at Ain Shams University Hospitals from April to December 2023. Patients undergoing planned THA under spinal anesthesia, age between 18 and 65 years, both sexes, and American Society of Anesthesiologists (ASA) physical state I-III were included. Exclusion criteria included age less than 18 years, patient refusal, ASA IV, any contraindications to regional anesthesia, known allergy to LA or dexmedetomidine, patients with mental or psychiatric disorders.

Sample size

By using the G power 3.1.9.2. sample size calculation was performed considering the 0.05 α error and 95% power of the study. Mohta and his colleagues[10] reported that the mean duration of analgesia with dexmedetomidine was 1864.7 ± 1192.1 min., and without dexmedetomidine was 500.5 ± 548.0 min. Therefore, to compensate for possible dropouts, 30 patients in each group were recruited.

Randomization and blindness

Computer-generated randomization numbers were used for random allocation and each patients' code was kept in an opaque sealed envelope. Patients was randomly allocated with 1:1 allocation ratio into two groups to receive postoperative unilateral L-ESPB on the surgery side by either 30mL 0.25% plain bupivacaine in Group (B) (control group) (*n*=30) or 30mL of 0.25% bupivacaine in addition to 1 µg/kg dexmedetomidine[11, 12] in Group (BD) (*n*=30).

Pre-operative

It was requested from all patients to fast for six to eight hours prior to the planned procedure. Medical and surgical history of the patients was taken, clinical examination of the patients was performed, and routine laboratory testing such as CBC, coagulation profile, serum creatinine, liver function, and RBS was done. All patients were instructed to use the Visual Analogue Scale (VAS) (A tool that help the patient to rate his pain intensity and is represented by a straight line with one end meaning no agony = 0 and worst pain =10 at the other end).

Operative

Wide bore (16–18G) vascular access was obtained. 2- 3 mg of intravenous midazolam was used to sedate all patients. Ringer acetate infusion at a rate of 10 ml/hr was initiated, and a prophylactic antibiotic was given following negative sensitivity test. Routine monitoring included the use of pulse oximetry (SpO2), non-invasive mean arterial blood pressure (MAP), five-lead ECG, and heart rate (HR). Hyperbaric bupivacaine 15-20 mg was used in conjunction with 25 µg of fentanyl to provide spinal anesthesia under strict aseptic circumstances.

After end of surgery and while the patient was still in the lateral position, a unilateral L-ESPB was carried out on the operative side by an experienced anesthesiologist. Following skin sterilization, the low frequency curvilinear transducer of the ultrasound device (GE, LOGIQ V5, China) was coated with a sterile sleeve and sterile gel. A fourth lumbar vertebra was located and in a longitudinal parasagittal direction, the transducer was placed 3 cm

lateral to the L4 spinous process. The erector spinae muscles were visualized superficially to the tip of the L4 transverse process. A Sonoplex® needle (PAJUNK, Germany) was introduced in-plane until it reached the transverse process. Following negative aspiration, the LA was injected in the interfacial plane between the targeted transverse process and the erector spinae muscles[13]. In Group B, 30mL 0.25% plain bupivacaine were injected. While in Group BD 30mL 0.25% bupivacaine in addition to 1 µg/kg dexmedetomidine[11, 12] were injected. The position of Sonoplex® needle was verified by visible fluid raising the erector spinae muscle from the transverse process. Study drugs used in the block were bupivacaine (Sunny pharmaceutical, Egypt) and dexmedetomidine (Hospira Inc., USA)

Postoperative

Paracetamol (1 g/8 hrs.) was prescribed to all participants. Rescue analgesia was given as Nalbuphine HCL 5 mg IV bolus if the VAS ≥ 4 to be re-administered after thirty min if pain persists until the VAS < 4. VAS was assessed at 0, 1, 2, 4, 8, 12, 18 and 24h postoperatively.

Eventful changes in recovery room were also noted. Hypotension was managed with ephedrine 5-10 mg I.V. bolus, bradycardia was managed by I.V. atropine 0.02 mg/kg, and postoperative nausea and vomiting (PONV) and managed by ondansetron I.V. 4mg.

Measurements

Patients' demographic data [age, sex, weight, height, BMI, ASA classification], and duration of surgery were recorded. The duration of analgesia was recorded as the time-span between L-ESPB and the time of 1st opioid prescription, VAS was recorded at 0 (immediately before block injection) then at 1, 2, 4, 8, 12, 16 and 24h post-operatively, total dose of Nalbuphine HCL consumption in the first day post-operatively was also recorded, heart rate(HR) and mean arterial pressure(MAP) were recorded at the same previous time intervals, any complications of regional anesthesia or blocks were recorded and treated as appropriate, and Ramsey sedation score (RSS) was evaluated at the same time intervals.

Study outcomes

Analgesia duration (primary outcome) was recorded as the interval between L-ESPB and the time of 1st opioid prescription. Secondary outcomes included VAS score assessment recorded, the total dose of Nalbuphine HCL consumption in the first 24 hours postoperatively, Hemodynamic data (HR, MAP) and RSS.

Statistical analysis

Data statistical analysis was conducted using SPSS v26 (IBM Inc., Chicago, IL, USA). Normality of data distribution was tested by Shapiro-Wilks test. Quantitative variables were presented as mean and standard deviation (SD) for parametric data were and compared by unpaired Student's t- test. While non-parametric data were compared by Mann Whitney test and displayed as median and interquartile range (IQR). Number and percentage were used to express qualitative data and compared utilizing Chi-square test or Fisher's exact test as indicated. *P value* <0.05 was considered statistically significant.

RESULTS

A total of 79 patients were evaluated for this trial. Eight participants declined to participate, while eleven patients did not match the eligibility requirements. The remaining patients were randomly divided equally into two groups (30 patients in each). Every patient that was assigned was tracked down and statistically analyzed (Figure1).

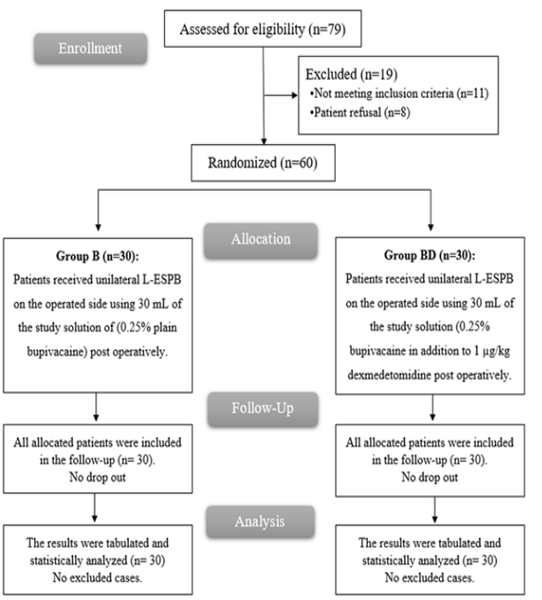

Fig. 1: CONSORT flow diagram showing the participants at every phase of the trial.

Age, sex, weight, height, BMI, ASA physical status and surgery duration were statistically indifferent between both groups (Table1).

Table 1: Demographic data and duration of surgery in the studied groups.

		Group B(*n*=30)	Group BD(*n*=30)	*P value*
Age (years)	**Mean ± SD**	53.2 ± 16.15	47.6 ± 13.45	0.150
	Range	20 – 62	23 - 65	
Sex	**Male**	16 (53.33%)	19 (63.33%)	0.432
	Female	14 (46.67%)	11 (36.67%)	
Weight (kg)	**Mean ± SD**	71.23 ± 12.06	73.3 ± 8.81	0.452
	Range	54 – 90	57 - 87	
Height (cm)	**Mean ± SD**	168.3 ± 7.18	167.1 ± 6.95	0.513
	Range	156 – 181	153 - 180	
BMI (kg/m²)	**Mean ± SD**	25.13 ± 3.91	26.33 ± 3.44	0.210
	Range	19.6 - 35.6	20.6 - 32.4	
ASA physical status	**I**	9 (30%)	8 (26.67%)	0.745
	II	18 (60%)	17 (56.67%)	
	III	3 (10%)	5 (16.67%)	
Duration of surgery (min)	**Mean ± SD**	113.67 ± 35.62	120.5 ± 30.52	0.428
	Range	60 – 170	70 - 175	

BMI: Body mass index; ASA: American Society of Anesthesiologists.

Time of 1st rescue analgesia were statistically delayed in group BD than group B (*P value*<0.001). Total dose of nalbuphine HCL consumption in the first 24h was statistically lower in group BD than group B (*P value*<0.001) (Table 2).

Table 2: Time of 1st rescue analgesia and total dose of nalbuphine HCL consumption in the 1st 24h in the studied groups.

		Group B (*n*=30)	Group BD (*n*=30)	*P value*
Time of 1st rescue analgesia (h)	**Mean ± SD**	7.17 ± 0.75	14.97 ± 2.25	**<0.001***
	Range	6 - 8	12 - 18	
Total dose of nalbuphine HCL consumption in the 1st 24h (mg)	**Mean ± SD**	14.5 ± 2.01	8.67 ± 2.92	**<0.001***
	Range	10 - 20	5 - 15	

*: Significantly different as *P value* ≤0.05.

VAS was statistically indifferent at 0h, 1h, 2h, 4h and 24h between both groups and was statistically lower at 8h, 12h and 16h in group BD than B (*P value*<0.05) (Table 3).

Table 3: Pain score assessed by VAS in the studied groups.

VAS at	Group B(*n*=30)	Group BD(*n*=30)	*P value*
0 h	0 (0 - 0)	0 (0 - 0)	0.169
1 h	1 (0 - 1)	0.5 (0 - 1)	0.127
2 h	2 (1 - 2)	1 (1 - 2)	0.135
4 h	2 (1 - 2)	1 (1 - 2)	0.082
8 h	2 (1.25 - 3)	2 (1 - 2)	**0.025***
12 h	3 (2 - 5)	2 (2 - 2.75)	**<0.001***
16 h	4 (3 - 5)	3 (2 - 3)	**0.012***
24 h	4 (4 - 5)	4 (3 - 5)	0.486

VAS: Visual analog scale; *: Significantly different as *P value* ≤0.05.

RSS was statistically indifferent at 1 h, 2 h, 4 h, 8h, 12 h, 16 h and 24 h between both groups (Table 4).

Table 4: Sedation score assessed by RSS in the studied groups.

	Group B(*n*=30)	Group BD(*n*=30)	*P value*
1 h	2 (2 - 2)	2 (2 - 2)	0.557
2 h	2 (2 - 2)	2 (2 - 2)	0.522
4 h	1 (1 - 2)	2 (1 - 2)	0.609
8 h	1 (1 - 1.75)	1 (1 - 2)	0.776
12 h	1 (1 - 1)	1 (1 - 1)	0.690
16 h	1 (1 - 1)	1 (1 - 1)	0.557
24 h	1 (1 - 1)	1 (1 - 1)	0.317

RSS: Ramsey sedation score

Heart rate was statistically indifferent at 0h, 1h, 2h, 4h and 24h between groups and was statistically lower at 8h, 12h and 16h in group BD than B (*P value*<0.05) (Table 5).

Table 5: Heart rate values in the studied groups.

	Group B(*n*=30)	Group BD(*n*=30)	*P value*
0 h	77.4 ± 5.97	76.27 ± 5.33	0.441
1 h	78.43 ± 8.29	76.8 ± 8.24	0.447
2 h	78.9 ± 8.49	77.57 ± 8.18	0.538
4 h	80.43 ± 6.1	79.17 ± 7.84	0.488
8 h	86.83 ± 12.72	80.2 ± 6.01	**0.012***
12 h	90.5 ± 10.36	83.17 ± 8.33	**0.004***
16 h	93.1 ± 11.12	83.83 ± 9.16	**0.001***
24 h	98.17 ± 12.78	92.3 ± 11.18	0.063

*: Significantly different as *P value* ≤0.05.

MAP was statistically indifferent at 0h, 1h, 2h, 4h and 24h between groups and was statistically lower at 8h, 12h and 16h in group BD than B (*P value*<0.05) (Table 6).

Table 6: MAP values in the studied groups.

	Group B(*n*=30)	Group BD(*n*=30)	*P value*
0 h	85.87 ± 10.05	87.9 ± 10.31	0.442
1 h	89.97 ± 11.73	86.63 ± 11.69	0.275
2 h	90.83 ± 11.14	88.23 ± 14.14	0.432
4 h	91.53 ± 11.56	88.87 ± 12.79	0.400
8 h	99.73 ± 14.12	92.07 ± 11.6	**0.025***
12 h	104 ± 12.91	96.77 ± 11.69	**0.027***
16 h	109.23 ± 16.22	99.87 ± 12.83	**0.016***
24 h	114.47 ± 11.62	114.03 ± 14.24	0.898

MAP: Mean arterial pressure; *: Significantly different as *P value* ≤0.05.

Hypotension, bradycardia and nausea and vomiting were statistically indifferent between groups (Table 7).

Table 7: Complications in the studied groups.

		Group B(*n*=30)	Group BD(*n*=30)	*P value*
Hypotension	**Yes**	3 (10%)	10 (33.33%)	0.057
	No	27 (90%)	20 (66.67%)	
Bradycardia	**Yes**	2 (6.67%)	6 (20%)	0.254
	No	28 (93.33%)	24 (80%)	
Nausea and vomiting	**Yes**	5 (16.67%)	3 (10%)	0.706
	No	25 (83.33%)	27 (90%)	

DISCUSSION

Both the orthopedic surgeon and the patient were concerned about the possibility of pain after a successful arthroplasty. Pain following surgery may be attributed to soft tissue or nerve damage, bone modifications, and implants[14]. When a THA is performed, postoperative pain treatment typically entails the significant prescription of opioids, which can have a variety of adverse effects. But with opioids, pain was not always adequately controlled[15].

ESPB has long been recognized to offer efficient analgesia following thoracic, abdominal, breast, and bariatric surgeries[16]. Dexmedetomidine addition to bupivacaine in ESPB has enhanced the analgesic effect. Dexmedetomidine has been shown to decrease tissue and nerve damage, lengthen the duration of motor and sensory block, and lessen postsurgical pain when added to LA[17].

In this study, time of 1st rescue analgesia was found to be statistically longer in group BD than group B. Furthermore, total dose of nalbuphine consumption in the 1st 24h was statistically lower in group BD than group B.

There were multiple reasons for the prolonged analgesic impact of dexmedetomidine when added to perineural LA, in addition to its central activity upon systemic absorption. The 1st reason was vasoconstriction caused by vascular α_2 adrenoceptor action at injection site, which prolongs effectiveness of LA by delaying its absorption[18]. Secondly, dexmedetomidine decreases acute LA-induced perineural inflammation and inhibits hyperpolarization-activated cationic currents without endangering nerves[19]. Last but not least, dexmedetomidine itself has analgesic properties, and its mode of action in treating peripheral nerve block pain is through peripheral A2A adenosine receptors[20].

Guo and his colleagues[21] conducted a study on 117 patients assigned for video-assisted thoracoscopic lobectomy surgery. The researchers assessed the efficacy of adding different doses of dexmedetomidine to ESPB on duration of analgesia and opioid consumption. They showed that opioid consumption was lower in the 1st 24hs after surgery in groups with ropivacaine/dexmedetomidine than ropivacaine only group.

In the study performed by ***Kumari et al***.[22] on 60 female patients planned for modified radical mastectomy under general anesthesia in addition to ESPB for postoperative analgesia. One group received 20 ml 0.375% ropivacaine only and the other group received 1 µg/kg dexmedetomidine + 20ml 0.375% ropivacaine. They reported that total dose and number of doses of rescue analgesic were significantly lower in the group where dexmedetomidine was added.

In agreement with our results, ***Hamed et al***.[23] performed a study on 60 cases scheduled for elective shoulder arthroscopy who received high thoracic ESPB for postoperative pain control. They showed that the time to first rescue was delayed and total opioid consumption was less in bupivacaine-dexmedetomidine group when compared to bupivacaine only group.

Manar et al.[24] conducted a study on 70 adult patients scheduled for spine surgery. Patients were randomly divided to receive ESPB either with 30ml 0.25% bupivacaine or with 0.25% bupivacaine 30ml + dexmedetomidine (0.5µg/kg). They noted that 1st analgesic request was delayed more in bupivacaine/dexmedetomidine group than bupivacaine only group. They reported that opioids used in the 1st 24hrs was considerably lower when dexmedetomidine was used as an adjuvant.

Supporting our results, ***Gao et al***.[25] performed a trial on 108 patients undergoing Video-Assisted Thoracic Surgery. ESPB was given randomly in 3 groups: R (0.375%ropivacaine 15ml with 0.1mg/kg dexamethasone), RD1 (0.375% ropivacaine 15ml adding 0.5µg/kg dexmedetomidine with 0.1mg/kg dexamethasone) and RD2 (0.375% ropivacaine 15ml + 1.0µg/kg dexmedetomidine with 0.1mg/kg dexamethasone). Although they added dexamethasone in all groups as a difference, they demonstrated that in the first postoperative 72 hours considerably longer duration of postoperative analgesia and less rescue drugs was given when dexmedetomidine was used as an adjuvant.

Wang and his colleagues[26] conducted a trial obtained on 60 adult patients diagnosed as cancer esophagus who randomly obtained ESPB and divided into 2 groups: 1st group received 28mL of ropivacaine (0.5%), with 2mL of normal saline and the 2nd group received 28 mL of ropivacaine (0.5%) with 0.5 µg/kg dexmedetomidine in 2mL. They concluded that ropivacaine/dexmedetomidine group consumed much lower opioids after surgery, and considerably had delayed 1st request of rescue analgesia.

Moreover, Hassan and Abdelgalil[27] performed a randomized controlled trial on 60 female participants planned for cancer breast surgery under general anesthesia. Patients were equally divided into 3 groups: ESPB group received 0.5% bupivacaine, The 2nd group received ESPB with 0.5% bupivacaine and 1µg/kg dexmedetomidine, and the control group with no block given. They showed that adding dexmedetomedine to bupivacaine has prolonged the duration of postoperative analgesia.

In the current study, VAS recording was statistically lower at 8h, 12h and 16h in group BD than group. Supporting our results, ***Hamed et al***.[23] revealed that VAS was lower in ESPB with dexmedetomidine than ESPB group. Moreover, ***Manar et al***.[24] showed that postoperative VAS was significantly lower in bupivacaine and dexmedetomidine than bupivacaine alone.

In agreement with our results, ***Yi-han et al***.[7] who studied 120 patients scheduled for one or two levels of posterior lumbar fusion under GA. The patients were split into two groups at random: intervention and control. Group(C) obtained 0.375%ropivacaine 20ml for ESPB, while Group (E), the intervention group, obtained of 0.375%ropivacaine 20ml with 1µg/kg dexmedetomidine. They demonstrated that the group receiving ropivacaine + dexmedetomidine had notably less postoperative VAS than group receiving ropivacaine alone.

Our results are consistent with, ***Gao et al***.[25] VAS was statistically lower in ropivacaine /dexmedetomidine group than in the ropivacaine only group during the 1st day after surgery. Confirming our results, ***Wang et al***.[26] showed that pain score was lower in ropivacaine/ dexmedetomidine group than ropivacaine only group. Different from our result, Hassan and Abdelgalil[26] showed that pain score was statistically indifferent between ESPB and ESPB/ dexmedetomidinE groups.

In the present study, RSS was statistically insignificantly different at 1 h, 2 h, 4 h, 8h, 12 h, 16 h and 24 h between both groups. However, ***Wang et al***.[26] showed that RSS was higher in dexmedetomidine group. This difference was explained by the difference in type of operation and the dosage of dexmedetomidine and type of local analgesia.

As regard heart rate and mean blood pressure values in the current study, the recorded values were statistically lower at 8h, 12h and 16h in BD than B. Many previous studies have supported our finding that the addition of dexmedetomidine to LA in ESPB leads to lower values in MAP and HR.[21-24].

The incidences of hypotension, bradycardia, and PONV in the present study were similar in both groups. Consisting with our results, previous studies reported that there were no incidence difference between both groups regarding PONV, bradycardia and hypotension[20-22], [25].

In contrast to our results, ***Yu et al***.[11] conducted a meta-analysis, they demonstrate that using dexmedetomidine as an adjuvant to LA in ESPB apparently lowers PONV. Another study by ***Gao et al***.[25] showed that PONV was significantly reduced in the dexmedetomidine group.

CONCLUSION

The addition of dexmedetomidine to bupivacaine in L-ESPB after hip arthroplasty prolongs analgesia and reduces consumption of opioid post operatively and pain score with stable hemodynamics.

CONFLICT OF INTERESTS AND FUNDING

There are no conflicts of interest is declared by authors.

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تأثير إضافة الديكسميديتوميدين إلى البوبيفاكيين في إحصار العضلة الناصبة للعمود الفقري على المستوى القطني على مدة تسكين الألم بعد تقويم مفصل الفخذ الجراحي. دراسة عشوائية مزدوجة التعمية محكومة

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المقدمة: تعتبر عملية تقويم مفصل الفخذ أحد أكثر العمليات الجراحية الكبرى شيوعًا والتي تعمل على تحسين نوعية الحياة المتعلقة بالصحة والحالة الوظيفية للمرضى. ومع ذلك، على الرغم من هذه المزايا، يمكن أن يرتبط تقويم مفصل الفخذ بألم كبير بعد العملية الجراحية. يمكن أن يؤثر ضعف التحكم في الألم بعد جراحة مفصل الفخذ بشكل سلبي على تعافي المريض. يمكن أن يؤثر سلبًا على حركة المريض المبكرة بعد العملية الجراحية، مما يزيد من خطر الإصابة بمرض الانصمام الخثاري الوريدي، وقد يعوق عملية إعادة التأهيل.

الهدف من البحث: تم تصميم هذه الدراسة لتقييم تأثير إضافة ديكسميديتوميدين إلى بوبيفاكايين في إحصار مستوى الفقرات القطنية الناصبة على مدة التسكين بعد العملية الجراحية بعد تقويم مفصل الفخذ.

المرضي وطرق العلاج: تم إجراء هذه الدراسة العشوائية والمضبوطة مزدوجة التعمية على ٦٠ مريضًا خضعوا لعملية تقويم مفاصل الفخذ الاختيارية تحت التخدير الشوكي، وكان عمرهم ٢١ عامًا أو أكثر، وكلا الجنسين مصابين بـ ASA I-III. تم تقسيمهم إلى مجموعتين (٣٠ مريضًا في كل مجموعة): المجموعة (ب) (المجموعة الضابطة): سيحصل المرضى على إحصار للعضلة الناصبة للعمود الفقري القطني أحادي الجانب على الجانب الذي تم إجراء العملية باستخدام ٣٠ مل من محلول الدراسة المكون من (٠,٢٥٪ بوبيفاكايين عادي) بعد العملية. المجموعة (BD): سيحصل المرضى على إحصار للعضلة الناصبة للعمود الفقري القطني من جانب واحد على الجانب الجراحي باستخدام ٣٠ مل من محلول الدراسة (٠,٢٥٪ بوبيفاكايين بالإضافة إلى ١ ميكروجرام/كجم ديكسميديتوميدين) بعد الجراحة.

النتائج: تأخر وقت الطلب الأول لتسكين الألم بشكل ملحوظ إحصائيًا في المجموعة BD مقارنة بالمجموعة B. وكانت الجرعة الإجمالية لاستهلاك نالبوفين في أول ٢٤ ساعة أقل بشكل ملحوظ إحصائيًا في المجموعة BD مقارنة بالمجموعة B. كان مقياس الألم VAS مختلفًا بشكل ملحوظ إحصائيًا عند ٠ ساعة و١ ساعة و٢ ساعة و٤ ساعات و٢٤ ساعة بين المجموعتين وكان أقل بشكل ملحوظ إحصائيًا عند ٨ ساعات و١٢ ساعة و١٦ ساعة في المجموعة BD مقارنة بالمجموعة B. كانت RSS مختلفة بشكل ملحوظ إحصائيا في ١ ساعة، ٢ ساعة، ٤ ساعات، ٨ ساعات، ١٢ ساعة، ١٦ ساعة و ٢٤ ساعة بين كلا المجموعتين. كان معدل ضربات القلب مختلفًا بشكل غير مهم إحصائيًا عند ٠ ساعة و١ ساعة و٢ ساعة و٤ ساعات و٢٤ ساعة بين المجموعتين وكان أقل بشكل ملحوظ إحصائيًا عند ٨ ساعات و١٢ ساعة و١٦ ساعة في المجموعة BD مقارنة بالمجموعة B. كان الضغط الشرياني الوسطي مختلفًا بشكل غير مهم إحصائيًا عند ٠ ساعة و١ ساعة و٢ ساعة و٤ ساعات و٢٤ ساعة بين المجموعتين وكان أقل بشكل ملحوظ إحصائيًا عند ٨ ساعات و١٢ ساعة و١٦ ساعة في المجموعة BD مقارنة بالمجموعة B. انخفاض ضغط الدم، وبطء القلب والغثيان والقيء كانت مختلفة بشكل ملحوظ إحصائيا بين المجموعتين.

الخلاصة: إن إضافة ديكسميديتوميدين إلى البوبيفاكايين في احصار العضلة الناصبة للعمود الفقري بعد تقويم مفصل الفخذ يقلل من استهلاك المواد الأفيونية بعد العملية الجراحية ودرجة الألم، ويطيل مدة التسكين وله الافضلية على ديناميكية الدورة الدموية دون اختلاف في الآثار الجانبية مقارنة مع البوبيفاكايين وحده.