Journal of Anesthesia & Clinical Research

Abdelhamid, et al., J Anesth Clin Res 2016, 7:2
http://dx.doi.org/10.4172/2155-6148.1000601

Research Article Open Access

Efficacy and Safety of Dexamethasone as an Adjuvant to Local Anesthetics in Lumbar Plexus Block in Patients Undergoing Arthroscopic Knee Surgeries

Bassant M Abdelhamid[1*], Inas Elshzly[2], Sahar Badawy[2] and Ayman Yossef[3]

[1]*Lecturer of anesthesia, Cairo University, Egypt*

[2]*Professor of anesthesia Cairo University, Egypt*

[3]*Assistant Lecturer of Anesthesia, Cairo University, Egypt*

[*]**Corresponding author:** Bassant Mohamed Abdelhamid, Department of anesthesia, Lecturer of anesthesia, Faculty of medicine, Cairo University, Egypt, Tel: +201224254012; E-mail: bassantmohamed197@yahoo.com

Received date: Oct 04, 2015; **Accepted date:** Feb 08, 2016; **Published date:** Feb 18, 2016

Abstract

Background: The benefit of adding dexamethasone in regional anesthesia has recently been the focus of investigation as clinical reports suggest improved block characteristics. The aim of this study is to evaluate whether perineural administration of dexamethasone is more effective in prolonging the duration of lumbar plexus block than giving it systemically.

Methods: 60 (out of 72) patients were recruited to undergo arthroscopic knee surgery using lumbar plexus block. These patients were divided randomly into 3 groups, 20 patients in each; group L (combined lumbar plexus and sciatic nerve block with bupivacaine 0.5%), group D (combined lumbar plexus and sciatic nerve block with bupivacaine 0.5%+8mg dexamethasone in LPB) and group S (combined lumbar plexus and sciatic nerve block with bupivacaine0.5% +8mg intravenous dexamethasone).

Results: patients showed statistically significant enhanced onset of sensory loss in group D when compared to group L (p value=0.04) but no statistically significant difference found between groups S and L (p value=0.13) or between groups D and S (p value=0.86). Regarding onset of motor loss it was found that group D enhanced onset of motor block significantly (p value<0.01) when compared to group L, while group S showed statistically insignificant enhancement of onset of motor block when compared to group L (p value=0.15) or group D (p value=0.71). Regarding sensory block duration (Postoperative analgesia), both groups D and S showed significant prolonged duration of analgesia (p value<0.01and0.04 respectively) when compared to group L, but no statistically significance detected when compared to each other (p value=0.24) which means they both similarly prolong duration of analgesia clinically. Motor block duration was significantly prolonged in group D when compared to groups L and group S (p value≤0.01).While group S didn't show statistically significant prolongation of motor block when compared to group L (p value=0.4).

Conclusion: Both perineural and IV administration of dexamethasone improve the efficacy of lumbar plexus block by prolonging the duration of analgesia, enhancing onset action of local anesthetics, and reducing postoperative analgesic requirements without increasing the incidence of complications.

Keywords: Dexamethasone; Lumbar plexus block; Arthroscopic knee surgeries

Key messages

To produce safe and efficient anesthesia with decreased perioperative pain score, early ambulation and hospital discharge.

Background

Over the last decades, the numbers of total knee arthroplasty procedures performed have increased dramatically. This very successful intervention, however, associated with significant postoperative pain and adequate postoperative analgesia, is mandatory in order to allow for successful rehabilitation and recovery [1].

Compared with neuroaxial (spinal/epidural) anesthesia, peripheral nerve blocks minimizes hypotension, urinary retention and eliminates the risk of spinal hematoma and infection that might occur with central neuraxial blocks [2].

Looking at the clinical efficacy, there is substantial evidence that a posterior approach of the lumbar plexus block has significant advantages compared to the anterior approach (femoral nerve block or "3-in-1 block") of the lumbar plexus. As the posterior approach is more effective in blocking the obturator nerve (the articular branches innervate the anteromedial capsule of the hip joint [3].

Dexamethasone appears to be the best method to prolong analgesia as an adjuvant over clonidine, epinephrine, or midazolam. The value of several additional hours of analgesia is a risk/benefit discussion that anesthesiologists must have with their patients, given the off-label use of perineural dexamethasone. [4].

The aim of this study is to evaluate whether perineural administration of dexamethasone is more effective in reducing the onset, prolonging the duration of lumbar plexus block and decrease

the requirement of post operative systemic analgesia than giving it systemically.

Patients and Methods:

Approval of the ethical and research committees of our hospital was obtained. Prospective randomized controlled trial was conducted in orthopedic operating theater in the period from May 2014 to December 2014. Patients were radomized using concealed envelope method. The informed consent of the participants was taken after describing the steps of the procedure.

Preoperative assessment was done as follows; full explanation of type of anesthesia planned, history taking, laboratory investigations including; full blood count, liver and kidney functions, coagulation profile and blood sugar.

Patients with ASA (American Society of Anesthesiologists) physical class I or II undergoing endoscopic knee procedures. Patients of both genders and aged 18-50 years old were included in the study.

Patients with cardiopulmonary diseases, hypovolemia, coagulopathy, any contraindication to regional anesthesia or fever were excluded.

60 patients were assigned randomly using concealed envelop method to one of three groups. Each group consisted of 20 patients: Group L (combined lumbar plexus and sciatic nerve block without adjuvant), Group D (combined lumbar plexus and sciatic nerve block +perineural 8mg dexamethasone in LPB) and Group S (combined lumbar plexus and sciatic nerve block+intravenous 8mg dexamethasone).

IV cannula 18 G was inserted and midazolam 0.02mg/kg was given IV for sedation.

Lumbar plexus block was done using Capdevila's approach. The Patient was placed in the lateral decubitus position with a slight forward tilt. The foot on the side to be blocked was positioned over the dependent leg so that twitches of the quadriceps muscle and patella could be easily noted. Palpation of the anterior thigh was useful to make sure the motor response was indeed that of the quadriceps muscles. Identification of the iliac crest was by palpating hand over the ridge of the pelvic bone and pressing firmly against it. The spinous process of L4 was identified. A line was drawn from the center of the L4 spinous process laterally, to intersect with a line that passes through the posterior superior iliac spine parallel to the vertebral column on the side to be blocked. The puncture point was at the junction of the lateral one third and medial two thirds of the line joining L4 to the line passing through the PSIS.

After sterilization of the skin and under full aseptic precautions; the needle was advanced at right angles to the skin until the transverse process of L4 was encountered. The needle was then directed caudally, no more than 20mm; the accepted end point for the lumbar plexus was stimulation of the femoral nerve, observed by contraction of the quadriceps muscle. Quadriceps contraction which produced patella twitching was sought with an initial current of 1.5mA, and once elicited; the current was reduced until contraction was at 0.5mA. Motor response should not be present at a current less than 0.5 mA. 20ml of 0.5% Bupivacaine was injected slowly in increments of 5 mL after negative aspiration.

Sciatic nerve block was performed using parasacral approach just to cover the tourniquet pain by the use of nerve stimulator and injection of 10 ml 0.5% bupivacaine after obtaining appropriate muscle response (planter flexion and inversion of the due to stimulation of the tibial nerve and dorsiflexion and eversion due to stimulation of common peroneal).

To determine loss of motor function Bromage scale from 1 to 3 (1=lack of hip flexion, 2=loss of knee extension, 3-loss of ankle dorsiflexion) was used. Sensory block was assessed by pinprick (using a 25 gauge hollow needle) every five minutes in the L1-S1 dermatomes. Failure to achieve motor or sensory loss after 30 min was considered block failure.

The measured parameters were; heart rate and mean blood pressure in preoperative, at skin incision, after 15, 30, 60min, 2, 4, 6, 12 and 24 hrs after block application, Pain assessment by the aid of Visual analogue scale recorded postoperative after 30 min., 2, 4, 6, 8, 12 and 24 hours after block application, onset of both sensory and motor block and duration of sensory and motor block, the total doses of paracetamol used as additional analgesia during the 1st 24 hours, incidence of Complications and patients' satisfaction using 5 point Likert scale [5].

Statistical analysis

SPSS statistics v.17.0 for windows was used. Data was summarized and analyzed; and the results were reported as mean ± SD. Comparison of the means of the 3 study groups was done using the ANOVA test. Non parametric variables were compared using Kruskal Wallis test. For all statistical tests, the level of significance was fixed at the 5% level. A p-value <0.05 indicated significant difference. The smaller the p-value obtained, the more significant was the difference.

Sample size

Given that the duration of thelumbar plexus sensory block is reported to be 18 ± 2 hours, a total sample size of 57 patients randomly allocated into three equal groups (19 patients per group) will have 80% power to detect a clinically significant difference of 10%or more in the mean duration of sensory block (effect size f=0.424, α error=0.05, β error=0.2). Statistical power calculations was performed using computer program G*Power 3 for Windows. (Franz Faul, Universität Kiel, Germany).

Results:

60 (out of 72) patients were recruited to undergo arthroscopic knee surgery using lumbar plexus block.12 patients were excluded from this study (5 patients showed failure of sensory block for 30 min after block application and 7 patients didn't complete the study due to early hospital discharge).

The demographic data of the patients, their baseline hemodynamic parameters, temperature and type of operation showed no statistical significant difference among the three study groups (Table1).

	Group L (n=20)	Group D (n=20)	Group S (n= 20)
Age (years)	33 ± 14	32 ± 13.6	34 ± 15
Gender	8 (40%)	11 (55%)	12(60%)
Male no. (%)	12(60%)	9 (45%)	8(40%)
Female no. (%)			

Weight (Kg)	70 ± 0.6	69 ± 0.8	71 ± 0.3
Duration of surgery(hrs)	2 ± 0.6	1.9 ± 0.8	2.1 ± 0.2
Data was presented as mean ± SD or no. (%)			

Table 1: Demographic data of the three studied groups.

The mean heart rate and the mean arterial blood pressure (MAP) preoperatively and intraoperative showed no significant variations between the 3 groups and within each group (Tables 2 and 3).

	Group L (n=20)	Group D (n=20)	Group S (n=20)	P value
T0	81.7 ± 11.4	83.7 ± 10.7	74 ± 11.12	®0.748 ©0.111 §0.07
T1	80.7 ± 5.6	83.7 ± 4.7	86.25 ± 5.3	®0.189 ©0.08 §0.28
T2	81.7 ± 6.1	81.3 ± 5.7	84 ± 6.1	®1 ©0.406 §0.39
T3	78.9 ± 6.9	79.7 ± 7.2	81.7 ± 5.7	®0.92 ©0.36 §0.59
T4	79.5 ± 6.9	79.3 ± 6.2	81.3 ± 7.3	®0.9 ©0.71 §0.63
T5	74.5 ± 5.8	75.3 ± 6.4	76.4 ± 6.1	®0.91 ©0.59 §0.84
T6	77.1 ± 4.1	76.9 ± 5.8	78.2 ± 4.2	®0.99 ©0.76 §0.70
T7	68.6 ± 6.8	78.3 ± 7.1	79.9 ± 6.8	®0.98 ©0.79 §0.70
T8	77.6 ± 7.5	81.6 ± 8.1	81.3 ± 7.6	®0.33 ©0.29 §0.99
T9	76.1 ± 7.1	79.2 ± 7.4	81.1 ± 7.6	®0.37 ©0.08 §0.68
T0=preoperative; T1=skin incision, T2=15 minutes thereafter; T3=30 minutes thereafter; T4=60 minutes thereafter; T5=4 hours thereafter; T6=6 hours thereafter; T7=8 hours thereafter; T8=12 hours thereafter; T9=24 hours thereafter, Data was presented as mean ± SD; ®=p value between Group L and D; ©= p value between Group L andS,§= p value between Group D and S; *=Significant				

Table 2: Mean heart rate intraoperative and postoperative for the three groups.

	Group L (n=20)	Group D (n=20)	Group S (n=20)	p value
T0	92.3 ± 5.7	93.7 ± 4.5	95.4 ± 4.1	®0.60 ©0.1 §0.50
T1	93.3 ± 5.6	92.8 ± 4.4	91.1 ± 4.8	®0.95 ©0.33 §0.49
T2	96.1 ± 3.8	94.8 ± 4.4	96.5 ± 3.1	®0.50 ©0.95 §0.34
T3	95.3 ± 3.6	94.5 ± 4.1	94.6 ± 4.1	®0.82 ©0.86 §0.99
T4	94.4 ± 5.3	94.1 ± 3.9	96.1 ± 3	®0.96 ©0.41 §0.28
T5	94.1 ± 4.5	94.6 ± 4.1	95.6 ± 3	®0.91 ©0.45 §0.7
T6	94.4 ± 3.8	93.5 ± 4.6	94.2 ± 4.6	®0.79 ©0.99 §0.85
T7	93.3 ± 4.5	93.2 ± 5.4	94.6 ± 4.8	®0.99 ©0.65 §0.63
T8	93.6 ± 5.8	93.7 ± 4.7	93.3 ± 5.3	®0.99 ©0.97 §0.96
T9	93.8 ± 5.3	93.5 ± 4.1	92.2 ± 5.4	®0.97 ©0.57 §0.71
T0=preoperative; T1=skin incision, T2=15 minutes thereafter; T3=30 minutes thereafter; T4=60 minutes thereafter; T5=4 hours thereafter; T6=6 hours thereafter; T7=8 hours thereafter; T8=12 hours thereafter; T9=24 hours thereafter. Data was presented as mean ± SD; ®=p value between Group L and D; ©= p value between Group L and S; §= p value between Group D and S; *=Significant				

Table 3: Mean ABP intraoperative and postoperative (mmHg) for the three studied groups.

By comparing the visual analogue score (VAS) of the 3 groups; 30 min, 2, 4, 6, 8, 12 and 24 (hours) postoperatively, results revealed non-significant variation between the 3 groups at T0,T1,T2,T3,T4 and T5.

But there was a statistically significant difference between the 3 groupS at T6 and T7 with less VAS observed in both groups D and S (p value<0.02) when compared to group L and non-significant difference between groups D and S (Table 4).

Time	Group L (n=20) Median/range	Group D (n=20) Median/range	Group S (n=20) Median/range	p value
T1	0/(0-0)	0/(0-0)	0/(0-0)	®1 ©1 §1
T2	0/(0-0)	0/(0-0)	0/(0-0)	®1 ©1 §1
T3	0/(0-10)	0/(0-0)	0/(0-0)	®0.32 ©0.32 §1
T4	0/(0-10)	0/(0-0)	0/(0-0)	®0.08 ©0.08 §1
T5	0/(0-30)	0/(0-0)	0/(0-0)	®0.08 ©0.08 §1
T6	0/(0-80)	0/(0-0)	0/(0-0)	®0.01* ©0.01* §1
T7	40/(0-90)	5/(0-50)	0/(0-50)	®0.02* ©0.01* §0.7

T1=30 min after block application, T2=2 hrs after block application, T3=4 hrs after block application, T4= 6 hrs after block application, T5= 8 hrs after block application, T6= 12 hrs after block application, T7= 24 hrs after block application. VAS was measured in mm. Data was presented as median /range; ®=p value between Group L and D; ©= p value between Group L and S; §= p value between Group D and S; *=Significant

Table 4: Visual analogue score 30 min, 2, 4, 6, 8, 12, 24 (hrs) after block application.

Regarding onset of sensory loss, results showed statistically significant enhanced onset of sensory loss in group D when compared to group L (p value=0.04) but no statistically significant difference found between groups S and L (p value=0.13) or between groups D and S (p value =0.86) (Table 5).

Regarding onset of motor loss it was found that group D enhanced onset of motor block significantly (p value<0.01) when compared to group L, while group S showed statistically insignificant enhancement of onset of motor block when compared to group L(p value=0.15) or group D (p value=0.71) (Table 5).

Regarding sensory block duration (Postoperative analgesia), both groups D and S showed significant prolonged duration of analgesia (p value<0.01and0.04 respectively) when compared to group L, but no statistically significance detected when compared to each other (p value=0.24) which means they both similarly prolong duration of analgesia clinically (Table 5).

Motor block duration was significantly prolonged in group D when compared to groups L and group S (p value≤0.01).While group S didn't show statistically significant prolongation of motor block when compared to group L (p value=0.4) (Table 5).

	Group L (n=20)	Group D (n=20)	Group S (n=20)	p value
Sensory loss onset(min)	15.4 ± 5.3	12.7 ± 1.3	14.1 ± 5.2	®0.04* ©0.13 §0.86
Motor loss onset(min)	25.1 ± 6.4	15.3 ± 1.8	16.5 ± 5.1	®0.00* ©0.15 §0.71
Sensory block duration (hrs)	18.9 ± 3.5	24 ± 1.2	21.7 ± 2.5	®0.00* ©0.04* §0.24
Motor block duration (hrs)	21.4 ± 3.2	26.4 ± 1.3	22.4 ± 2.1	®0.00* ©0.40 §0.00*
min=minutes, hrs=hours, Data was presented as mean ± SD; ®=p value between Group L and D; ©= p value between Group L and S; §= p value between Group D and S; *=Significant				

Table 5: Sensory and motor loss onset (min) and regression (hrs).

Concerning postoperative analgesic requirements, it was noted that patients in groups D and S significantly required less analgesic doses in the first 24 hours postoperatively(p value=0.05), when compared with those in group L.

However there were no statistical significant differences between group D and group S (p value=1). One patient in group D and eight patients in group S required extra doses of analgesics (in the form of 1 gm paracetamol), compared to ten patients in group L (9 patients required 2 gm paracetamol and 1 patient required 3 gm paracetamol) (Table 6).

	Group L (n=20)	Group D (n=20)	Group S (n=20)	p value
Paracetamol (gm/24 hrs)	2.05 ± 0.3	0.05 ± 0.01	0.4 ± 0.09	®0.05* ©0.05* §1
hrs=hours; Data was presented as mean ± SD; *=Significant				

Table 6: Dose of paracetamol used in the first 24 (hours) postoperative.

There were two recorded complications in (groups S and D) in the form of hemodynamic instability after epidural spread that lead to anaesthesia for both limbs, and was managed by giving 500 ml crystalloids and 5 mg ephedrine increments till stabilizing blood pressure.

12 patients were excluded from this study as they showed failure of the block that was considered when failure of sensory block for 30 min after block application (Table 7).

Complications	Group L (n=20)	Group D (n=20)	Group S (n=20)
Yes	1(5%)	1(5%)	1(5%)
No	19(95%)	19(95%)	19(95%)
Data was presented as n (%)			

Table 7: Incidence of complications.

(Table 8) demonstrates patient satisfaction with lumbar plexus block in the three studied groups using Likert scale of satisfaction and it was mostly ranging between satisfied and completely satisfied.

Patients satisfaction	Group L (n=20)	Group D (n=20)	Group S (n=20)
Completely satisfied	2 (10%)	5 (25%)	2 (10%)
Satisfied	18 (90%)	14 (70%)	18 (90%)
Not Satisfied nor Dissatisfied	0 (0%)	1 (5%)	0 (0%)
Data was presented as n (%) using 5 point Likert scale.			

Table 8: Patient's satisfaction.

Discussion

Evidently the dexamethasone was proven superior in prolonging the duration of analgesia when compared to other adjuvants such as clonidine, neostigmine and tramadol [6].

Regarding hemodynamic changes (heart rate and mean blood pressure intra and postoperative), results of the present study showed hemodynamic stability in the three groups.

In addition, Siamak Y et al. [7] who enrolled 78 patients received axillary block for forearm fracture operation in 3 groups; [(group L) received 40 ml lidocaine and 2 ml distilled water, (group LD) received 40 ml lidocaine and 2 ml dexamethasone and (group LF) received 40 ml lidocaine and 2 ml fentanyl]. They found no difference between the groups in regards to hemodynamics.

Regarding onset of sensory loss, results of this study showed that both perineural and IV dexamethasone enhanced the onset of sensory block. But only perineural dexamethasone enhanced the onset of motor block not the IV administration.

These results were consistent with Yadav RK. et al. [8] study that included 90 patients received supraclavicular brachial plexus block and randomized into 3 groups; [(group A) received 24 ml lignocaine (1.5%) with adrenaline, (group B) received 24 ml lignocaine (1.5%) with adrenaline +500 µg Neostigmine, and (group C) received 24 ml lignocaine (1.5%) with adrenaline +4 mg Dexamethasone perineural]. Results showed enhanced onset of both sensory and motor block and prolonged duration dexamethasone group compared to the other two groups.

In addition the results of the present study were consistent with Prashant A. et al. [9] who evaluated the effect of dexamethasone added to lidocaine regarding onset of action and duration. They enrolled 60 patients received supraclavicular brachial plexus block for elective hand, forearm and elbow surgeries. They concluded that addition of dexamethasone to 1.5% lidocaine with adrenaline speeds the onset and prolongs the duration of sensory and motor blockade.

However this study results disagreed with the study done by Knezevic NN. et al. [10] who performed a meta-analysis (included 1022 patients) in order to assess the effects of different doses of dexamethasone added to LA for brachial plexus blocks either alone or with epinephrine. The latter study concluded that perineural dexamethasone injection significantly delayed the onset of sensory and motor block regardless of the dose.

Effect of different doses of dexamethasone (either perineuraly or IV) was not included in this study, but Yadav et al. [8] used lignocaine with smaller doses of dexamethasone (4 mg) than that used in the

present study (8 mg); and found that low dose of dexamethasone also enhanced onset of motor and sensory blocks. Moreover, Knezevic NN. et al. proved that smaller doses of dexamethasone (4-5 mg) were as effective as higher ones (8-10 mg).

The results of the present study showed that both perineural and IV dexamethasone prolong the duration of analgesia similarly. That was consistent with Desmet M. et al. [11] who enrolled 150 patients presenting for arthroscopic shoulder surgery with inter scalene block and divided them into 3 groups; [(group R) received 30 ml ropivacaine 0.5%, (group RD) received 30 ml ropivacaine 0.5% and perineural dexamethasone 10 mg and (group RDiv) received 30 ml ropivacaine 0.5% with i.v. dexamethasone 10 mg]. The latter study proved that both IV and perineural dexamethasone has similar effects in prolonging analgesia after inter scalene block.

As for duration of analgesia, results of the present study were consistent with Abdallah F. et al. [12] who enrolled 75 patients divided into 3 groups 25 patients each, randomized to receive supraclavicular block using either [30-mL bupivacaine 0.5% alone (control group) or with concomitant intravenous dexamethasone 8 mg (DexIV group), or with perineural dexamethasone 8 mg (DexP group)]. Duration of analgesia was designated .Their results showed duration of analgesia was prolonged in the IV group (25 hours) compared with Control (13.2 hours), but similar to the perineural group (25 hours). Both IV and Perineural groups had reduced pain scores, reduced postoperative opioid consumption, and improved satisfaction compared with control group.

With regards to duration of the motor block, our results showed that both perineural and IV dexamethasone prolong the duration of motor block. It was found that perineural group showed prolongation of motor block duration when compared to IV administarion. These results were however against Abdallah F. et al. [12] who found that the IV group experienced longer motor block (30.1 hours) compared with perineural group (25.5 hours) and control groups (19.7 hours),although they used the same dose of dexamethasone and the same volume and concentration of bupivacaine used in the present study. Regarding analgesic requirements, results of this study showed that both IV and perineural dexamethasone when given with LPB reduced the analgesic requirements. That was consistent with Desmet M. et al. [11] and Abdallah F. et al. [12] who proposed that IV dexamethasone should be considered for routine use in patients having regional analgesia for the postoperative pain management.

Results of this study showed similar and significant reduction in VAS measurements at 12 and 24 hrs postoperative for both perineural and IV dexamethasone administration. These results were consistent with Desmet M. et al. [11] who found that both perineural and IV dexamethasone had reduced pain scores, reduced postoperative opioid consumption, and improved satisfaction.

In the present study no adverse effects were detected by adding dexamethasone as an adjuvant to local anesthetics in lumbar plexus block application.

That was consistent with Choi S. et al. [4] who enrolled 393 patients receiving dexamethasone (4–10 mg) as an adjuvant to LA used in brachial plexus block (BPB) and found that perineural administration of dexamethasone had no observed adverse events.

The results of the current study were consistent with Noss et al. [6] who made 11 randomized clinical trials (for 456 patients) evaluating adverse effects of variable doses of dexamethasone (ranging between 4 to 10 mg) as adjuvant to different types of LA (lidocaine, mepivacaine, bupivacaine and ropivacaine) in brachial plexus nerve blocks. They reported no major complications at one year when dexamethasone was added perineuraly.

Furthermore the results of the present study were consistent with Parrington et al. [13] who enrolled 45 adult patients undergoing elective hand or forearm surgeries under supraclavicular brachial plexus blockade, and were randomized to receive either [30 mL mepivacaine 1.5% plus dexamethasone 8 mg (4 mg/mL), or 30 mL mepivacaine 1.5% plus 2 mL normal saline]. They reported that the most frequent adverse effect in their study was numbness or tingling in the hand, which was transitory and was not significantly different between dexamethasone and control groups.

Knezevic NN. et al. [10] considered the excessively prolonged nerve block that was observed predominantly in the dexamethasone-adjuvant group as a complication.

Regarding patients' satisfaction, this study's results showed that all patients (100%) in groups S and L were satisfied, meanwhile (95%) of patients in group D were satisfied with (5%) neutral (not satisfied nor dissatisfied).

These results were in accordance with Desmet et al. [11] who found that both perineural and IV dexamethasone had reduced pain scores and improved patient satisfaction postoperative.

The results were also consistent with Ironfield et al. [14] questionnaire for 9969 patients (had operations done using peripheral nerve blocks). He stated that if they were willing to repeat the PNB they had or not, (90%) of respondents were satisfied or completely satisfied with the information provided about the nerve block, as well as the anesthesiologist-patient interaction.

Conclusion

Perineural dexamethasone when given as adjunct to LPB was found to enhance the action of LA by enhancing onset of action and prolonging duration for both sensory and motor blocks with significant less need for postoperative rescue analgesia, as well lower pain scores up to 24 hours postoperative, better patient satisfaction with no evidence to increase incidence of complications.

Moreover, it was found in this study that IV dexamethasone causes prolonged duration of analgesia but didn't found to enhance onset of action.

References

1. Thomas D, Mathias O, Stavros GM (2014) Perioperative pain control after total knee arthroplasty: An evidence based review of the role of peripheral nerve blocks. World J Orthop 5: 225-227.
2. Young TJ (2012) Peripheral nerve block for anesthesia in patients having knee arthroplasty. Korean J Anesthesiology 62: 403-411.
3. Ganidağli S, Cengiz M, Baysal Z, Baktiroglu L, Sarban S. (2005) The comparison of two lower extremity block techniques combined with sciatic block: 3-in-1 femoral block vs. psoas compartment block. Int J Clin Pract 59: 771-775.
4. Choi S, Rodseth R, McCartney CJL (2014) Effects of dexamethasone as a local anesthetic adjuvant for brachial plexus block: a systematic review and meta-analysis of randomized trials. Br J Anaesth 112: 427-439.
5. Likert R (1932) "A Technique for the Measurement of Attitudes". Archives of Psychology 140: 1-55.

6. Noss C, Lindsay M, Mark K (2014) Dexamethasone a Promising Adjuvant in Brachial Plexus Anesthesia? Journal of Anesthesia and Clinical Research 5: 7.
7. Siamak Y, Mahyar S, Zohreh Y (2013) Comparison of Postoperative Analgesic Effect of Dexamethasone and Fentanyl Added to Lidocaine through Axillary Block in Forearm Fracture.
8. Yadav RK, Sah BP, Kumar P, Singh SN (2013) Effectiveness of addition of neostigmine or dexamethasone to local anaesthetic in providing perioperative analgesia for brachial plexus block: A prospective, randomized, double blinded, controlled study. Kathmandu Univ Med J 6: 302-309.
9. Prashant AB, Padmanabha K, Kannappady G (2013) Effect of dexamethasone added to lidocaine in supraclavicular brachial plexus block. Indian journal of anesthesia 57.
10. Knezevic NN, Utchariya A, Kenneth DC (2015) Perineural Dexamethasone Added to Local Anesthesia for Brachial Plexus Block Improves Pain but Delays Block Onset and Motor Blockade Recovery Pain Physician 18: 1-14.
11. Desmet M, Braems H, Reynvoet M, Plasschaert S, Van Cauwelaert J (2013) I.V. and perineural dexamethasone are equivalent in increasing the analgesic duration of a single-shot interscalene block with ropivacaine for shoulder surgery: a prospective, randomized, placebo-controlled study. Br J Anaesth111: 445-452.
12. Abdallah FW, Johnson J, Chan V, Murgatroyd H, Ghafari M (2015) Intravenous Dexamethasone and Perineural Dexamethasone Similarly Prolong the Duration of Analgesia After Supraclavicular Brachial Plexus Block: A Randomized, Triple-Arm, Double-Blind, Placebo-Controlled Trial. Reg Anesth Pain Med 40: 125-132.
13. Parrington SJ, O'Donnell D, Chan VW, Brown-Shreves D, Subramanyam R (2010) Dexamethasone added to mepivacaine prolongs the duration of analgesia after supraclavicular brachial plexus blockade. Reg Anesth Pain Med 35: 422-426.
14. Ironfield CM, Barrington MJ, Kluger R, Sites B (2014) Are Patients Satisfied After Peripheral Nerve Blockade? Results from International Registry of Regional Anesthesia. Reg Anesth Pain Med 39: 48-55.