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Effect of Adding Dexamethasone to Bupivacaine in Ultrasound Guided AdductorCanal Block for Post-Operative Analgesia Following Knee Arthroscopy

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ABSTRACT

Background: Arthroscopic knee surgery encompasses a wide range of surgical operations involving the knee, and several analgesic regimens have been studied to determine the ideal analgesic combinations. The kind and duration of surgical intervention influence post-operative pain response, and it is sometimes difficult to determine which analgesic regimen would be optimal for each patient until post-operatively. **Objective:** The aim of the current study was to assess the effects of perineurally dexamethasone (DXM) addition to bupivacaine (BVC) in adductor canal block (ACB) for post-operative analgesia after knee arthroscopy under spinal anesthesia regarding.

Patients and methods: This a randomized controlled double-blinded controlled clinicaltrial performed at Ain Shams University Hospitals, Cairo, Egypt. Study Period: Six months. Adults undergoing Knee Arthroscopy under Spinal Anaesthesia employing computer-generated codes and opaque sealed envelopes, were randomly divided into 2 groups: Group A (study group): These patients administered ACBwith 20ml plain BVC (0.25%) + 8 mg DXM (2ml), Group B (control group): The patientsreceived ACB with 20ml plain BVC (0.25%) + 2 ml of 0.9% saline.

Results: A high statistical significant difference ($p<0.001$) was found between both groups as regards analgesic duration (time of first call for analgesics) (min). The highest value was reported in group A(study) and group B(control) (241.02±36.15 and 188.49±28.27) respectively, this indicates that that the needs of analgesic in the group B were earlier than in group A. Also, a high statistical significant difference ($p<0.001$) was reported in terms of cumulative morphine consumption "mg". The highest value was reported in Group B and Group A 4 (3-4) and 2 (1-2) respectively, this indicates much higher needs of analgesic in the Group B than group A.

Conclusion: ACB is an effective post-operative analgesic for knee arthroscopy performed under spinal anesthesia. Nonetheless, combining (8 mg) DXM with (0.25%) BVC in ACB resulted in superior post-operative analgesia and less analgesic usage compared with BVC alone.

Keywords: Dexamethasone, Bupivacaine, Ultrasound Guided Adductor Canal Block, Analgesia, Knee Arthroscopy.

INTRODUCTION

Arthroscopic knee surgery encompasses a wide range of surgical operations involving the knee, and several analgesic regimens have been studied to determine the ideal analgesic combinations. The kind and duration of surgical intervention influence post-operative pain response, and it is sometimes difficult to determine which analgesic regimen would be optimal for each patient until post-operatively [(1)].

Post-operative discomfort from arthroscopic knee surgery can interfere with early ambulation, range of motion, as well as length of hospitalization. After surgery, unrelieved pain can cause clinical and psychological alterations that have an impact on quality of life [(2)].

After knee arthroscopies, appropriate analgesia with motor preservation is an objective in order to allow for a less hospitalization duration, early rehabilitation, and speedier recovery. There are numerous methods for treating post-operative pain, such as systemic (i.e., upload and nonpaid) analgesics and regional (i.e., neuraxial and peripheral) analgesic procedures. Multimodal analgesia can be accomplished through the combination of different analgesic agents which act differently and at different sites, leading to synergistic analgesic effect with fewer side effects [(3)].

Adverse consequences of epidural analgesia include urine retention, motor paralysis, and delayed early mobilization [(4)].

Femoral Nerve Block (FNB) is a well-established therapy for post-operative discomfort in arthroscopic knee surgery, although it is associated with decreased quadriceps strength and an enhanced risk of falling [(5)].

ACB with Bupivacaine is a highly effective method to the saphenous nerve initially stated by **Vander-Wal *et al.*** [(6)]. ACB reduces quadriceps muscular strength less than FNB as only the motor nerve to the Vastus medialis of the quadriceps crosses the adductor canal [(7)].

The aim of the current study was to assess the effects of perineurally DXM addition to BVC in ACB for post-operative analgesia following arthroscopic knee surgery under spinal anesthesia regarding; duration of postoperative analgesia as a primary objective and one-day postoperative analgesic and upload consumption as a secondary objective.

PATIENTS AND METHODS

A randomized controlled double-blinded controlled clinical trial was conducted at Ain Shams University Hospitals, Cairo, Egypt. The Study duration was six months.

Study Population: Adults undergoingarthroscopic knee surgery under Spinal Anaesthesia employing computer-

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generated codes and opaque sealed envelopes, were randomly divided into 2 groups: Group A (study group): These patients administered ACBwith 20ml plain BVC (0.25%) + 8 mg DXM (2ml), Group B (control group): They administered ACB with 20ml plain BVC (0.25%) + 2 ml of 0.9% saline.

Inclusion Criteria:

- Males and females aged 18-60.
- Patients with ASA I/ II.
- Scheduled for knee arthroscopy under spinal anesthesia.

Exclusion Criteria:

- Psychiatric disorders.
- Contraindications to regional anaesthesia as bleeding disorders or local infection.
- History of hypersensitivity to drugs utilized in the study.
- Pregnant women.

Sample size: When determining sample size, the power was adjusted to 80% and the alpha error to 5% using the PASS11 software, indicated that the time to first rescue analgesia in the intervention group (dexamethasone plus bupivacaine) was 123.17 (SD 39.77) vs. 98.87 (SD 40.17) minutes in the control group (bupivacaine plus saline). These results indicate that a sample size of a minimum of 45 patients in each group is needed.

Study Procedures:

Pre-operative settings: Each patient underwent a clinical evaluation, and standard preoperative tests which included CBC, Coagulation tests, liver and renal function tests, blood glucose level, and electrocardiography (ECG) were performed.

Intra-operative settings (The procedure was done by an expert professor):

Pulse oximeter, blood pressure (BP) monitoring, and ECG were all used when the patients first entered the operating room. The following baseline measurements were also taken: heart rate (HR), O_2 saturation (SpO_2), mean arterial pressure (MAP), systolic BP (SBP), and diastolic BP (DBP). The IV line was put in place, and the IV lactated Ringer was started. Under fully sterile circumstances, spinal anesthesia was administered to both groups using a 25-G spinal needle. All patients had spinal anaesthesia with 25 mg of fentanyl and 20 mg of hyperbaric BVC 0.5%. In our trial, ACB was performed following surgery. Specific tools needed include a portable ultrasonography machine, a skin antiseptic solution, a short-beveled regional block needle, a 22-gauge 100mm length needle, and sterile gloves.

In Group A: The patient administered ACB with 20ml BVC (0.25%) + 8 mg DXM (2ml). Positioning patients supine with slight knee flexion and external rotation of the leg. Placing a high frequency ultrasound probe on the anterior thigh aspect, approximately midway between the inguinal crease and medial condyle, disinfecting this area using Povidone-iodine 10% (Betadine), standing on the patient's side the to be blocked with the ultrasound device on the opposite side and the screen facing, identifying the femur (typically at Within the adductor canal, femoral artery is situated just beneath the sartorius. The goal of the procedure was to deposit local anaesthetic under Sartorius and around femoral artery since the saphenous nerve is usually never too tiny to be accurately visualized.

The ideal probe location is close to where the femoral artery "dives" posteriorly, and the probe was placed perpendicular to it. The image was optimized, and depth, gain, and frequency settings were adjusted as necessary. The vastus medialis, adductor magnus, and sartorius are anterolateral, posteromedial, and medial, respectively, to the location where the femoral artery starts to move deeper to create the popliteal artery. A needle was advanced into the adductor canal using an in-plane method from lateral to medial, making sure the needle tip could always be visible. You might do this by going via Sartorius or Vastus Medialis. Using a test dosage of (1 ml) local anesthetic, aspirate and inject it while keeping an eye on the local anesthetic's spread to make sure your needle tip is in place.

In Group B: Patients administered ACB with 20ml plain BVC (0.25%) + 2 ml of 0.9% saline.

Postoperative settings:

Visual analogue scale (VAS) was utilized to measure post-operative pain after patients were released from the operating room. All patients received ketorolac 30 mg IM /8h. It was immediately started after surgery in the PACU. If VAS ≥ 3 postoperatively, IV 2-4 mg of morphine were given (maximum cumulative dose is 10 mg). Time and dose were documented. Low BP (SBP 90 mmHg), dysrhythmia, bradycardia (HR 60 beats/minute), nausea, vomiting, or any other difficulties were noted as any adverse effects.

Atropine 0.5 mg was administered for bradycardia, 20 ml/kg lactated Ringer wasadministered for Low BP. If local anesthetic intoxication occurred, cardiovascular and respiratory support along with 20% intralipid bolus of 100 ml over 2-3 minutes was administered. HR and MAP were assessed on arrival to PACU and after half an hour, then hourly as long as the patient was in PACU. In the ward, vital signs and pain severity (VAS) were evaluated every 2h for 24h post-operative.

Measurements:

Primary outcome: Duration of surgical analgesia (from recovery to the first prescribed dosage of morphine).

Secondary outcome: The amount of morphine utilized per patient (as rescue analgesia) after surgery during a 24-hour period.

Ethical Consideration:

This study was ethically approved by the Institutional Review Board of the Faculty of Medicine, Ain Shams University. Written informed consent was obtained from all participants. This study was executed according to the code of ethics of the World Medical Association (Declaration of Helsinki) for studies on humans.

Statistical Analysis

The statistical software for social sciences, version 23.0 (SPSS Inc., Chicago, Illinois, USA) was utilized to analyze the recorded data. When the distribution of the quantitative data was parametric (normal), it was shown as means, standard deviations, and ranges; however, when the distribution was non-normal, it was shown as median and interquartile range (IQR). Qualitative factors were also demonstrated as percents and frequencies. Shapiro-Wilk Test and Kolmogorov-Smirnov tests examined the data for normality. The following p-value ranges were used to determine whether or not anything was significant: P-values ≤0.05 were considered significant, P-values ≤0.001 were considered extremely significant, and P-values > 0.05 were considered insignificant.

RESULTS

We performed our study on 90 patients who were divided into 2 equal groups: Group A (study group): received 20ml BVC (0.25%) + 8 mg DXM (2ml) & Group B (control group): The patients will receive 20ml BVC (0.25%) +2 ml of 0.9% saline, with the same inclusion and exclusion criteria.

Table 1 demonstrates that there was no significant difference (P>0.05) between groups as regards age, gender, ASA and duration of surgery "min".

Table (1): Comparison between study group and control group according to demographics.

Demographics	Group A (n=45)	Group B (n=45)	Test value	P-value
Age (years)				
Range	18-60	29-59	t=0.505	0.615
Mean±SD	40.17±10.04	41.20±9.30		
Sex				
Male	34 (75.6%)	36 (80.0%)	X^2=0.064	0.710
Female	11 (24.4%)	9 (20.0%)		
ASA				
I	32 (71.1%)	30 (66.7%)	X^2=0.052	0.820
II	13 (28.9%)	15 (33.3%)		
Duration of surgery (min)				
Range	117-184	120-182	t=0.062	0.951
Mean±SD	139.97±34.99	140.43±35.11		

Using: t-Independent Sample t-test; X^2: Chi-square test

Table 2 demonstrates a significantly higher mean of HR (P<0.05) in group B as compared to group A after 4hrs, until after 16hrs, the rest show insignificant differences (P>0.05).

Table (2): Comparison between study group and control group in terms of postoperative HR.

HR (beats/minute)	Group A (n=45)	Group B (n=45)	Test value	P-value
PACU	76.89±5.51	74.71±6.34	1.741	0.085
After 30min.	78.43±4.72	78.81±7.12	0.298	0.766
After 1hr.	77.66±5.12	76.76±5.73	0.786	0.434
Surgical ward	78.04±4.92	77.79±6.43	0.207	0.836
After 2hrs.	80.40±6.07	83.01±7.48	1.818	0.073
After 4hrs.	81.60±5.20	88.14±8.08	4.566	<0.001**
After 6hrs.	83.23±3.99	89.91±6.75	5.715	<0.001**
After 8hrs.	84.90±4.26	91.70±5.76	6.367	<0.001**
After 10hrs.	84.06±4.13	90.80±6.26	6.029	<0.001**
After 12hrs.	86.59±4.35	93.53±4.63	7.328	<0.001**
After 14hrs.	88.33±8.35	94.37±8.49	3.403	0.002*
After 16hrs.	89.12±5.40	95.23±6.24	4.967	<0.001**
After 18hrs.	85.96±6.57	88.64±8.93	1.622	0.109
After 20hrs.	82.52±7.62	84.98±6.25	1.674	0.098
After 22hrs.	81.88±8.42	82.07±7.83	0.111	0.912
After 24hrs.	79.19±8.25	80.91±6.69	1.086	0.280

Using: t-Independent Sample t-test. * Significant; ** highly significant

Table 3 demonstrates a significantly higher mean of SBP (P<0.05) in group B as compared to group A after 4hrs, until after 16hrs, the rest show insignificant differences (P>0.05).

Table (3): Comparison between study group and control group as regards postoperative SBP.

SBP (mmHg)	Group A (n=45)	Group B (n=45)	Test value	P-value
PACU	101.90±8.12	100.00±8.59	1.078	0.284
After 30min.	103.25±9.65	103.58±7.19	0.184	0.855
After 1hr.	102.58±8.47	101.79±7.52	0.468	0.641
Surgical ward	102.91±8.66	102.69±8.05	0.125	0.901
After 2hrs.	104.61±9.18	107.35±7.07	1.586	0.116
After 4hrs.	106.98±9.45	112.67±5.66	3.465	<0.001**
After 6hrs.	106.44±8.29	112.24±5.02	4.015	<0.001**
After 8hrs.	108.87±8.76	114.79±8.68	3.320	0.002*
After 10hrs.	107.66±9.32	113.52±6.85	3.399	0.002*
After 12hrs.	108.39±5.35	116.39±4.86	7.425	<0.001**
After 14hrs.	111.85±9.11	118.02±5.48	3.893	<0.001**
After 16hrs.	112.55±6.06	119.67±4.59	6.283	<0.001**
After 18hrs.	113.16±5.62	115.62±8.89	1.569	0.120
After 20hrs.	108.36±7.22	110.83±8.83	1.453	0.149
After 22hrs.	107.54±6.55	107.70±5.97	0.121	0.904
After 24hrs.	104.46±9.43	105.66±5.69	0.731	0.467

Using: t-Independent Sample t-test; * Significant; ** highly significant

Table 4 demonstrates a significantly higher mean of DBP (P<0.05) in group B as compared to group A after 4hrs, until after 16hrs, the rest show insignificant differences (P>0.05).

Table (4): Comparison between the study groups as regards postoperative DBP.

DBP (mmHg)	Group A (n=45)	Group B (n=45)	Test value	P-value
PACU	63.90±6.41	62.00±6.66	1.379	0.171
After 30min.	65.25±5.75	65.58±7.28	0.239	0.812
After 1hr.	64.58±6.08	63.79±6.97	0.573	0.568
Surgical ward	64.91±5.91	64.69±7.12	0.159	0.874
After 2hrs.	66.91±5.42	69.35±7.39	1.786	0.078
After 4hrs.	68.98±5.92	74.67±8.71	3.624	<0.001**
After 6hrs.	68.44±6.25	74.24±9.31	3.470	<0.001**
After 8hrs.	70.87±5.81	76.79±5.89	4.800	<0.001**
After 10hrs.	69.66±6.03	75.52±7.60	4.052	<0.001**
After 12hrs.	70.39±9.00	78.39±9.46	4.110	<0.001**
After 14hrs.	73.85±5.49	79.02±8.88	3.322	0.002*
After 16hrs.	74.55±8.34	80.67±9.71	3.207	0.002*
After 18hrs.	72.05±8.75	74.38±5.69	1.498	0.138
After 20hrs.	68.78±7.25	71.11±5.75	1.689	0.095
After 22hrs.	68.63±7.88	68.79±8.42	0.093	0.926
After 24hrs.	66.36±5.19	67.49±8.68	0.750	0.456

Using: t-Independent Sample t-test; * Significant; ** highly significant

Table 5 demonstrates a significantly higher mean of MAP (P<0.05) in group B as compared to group A after 4hrs, until after 16hrs, the rest show insignificant differences (P>0.05).

Table (5): Comparison between study group and control group according to postoperative MAP.

MAP (mmHg)	Group A (n=45)	Group B (n=45)	Test value	P-value
PACU	76.90±7.59	75.00±7.34	1.207	0.231
After 30min.	78.25±8.25	78.58±6.72	0.208	0.836
After 1hr.	77.58±7.92	76.79±7.03	0.500	0.618
Surgical ward	77.91±8.09	77.69±6.88	0.139	0.889
After 2hrs.	79.61±8.58	82.35±6.61	1.697	0.093
After 4hrs.	81.98±8.08	87.67±5.29	3.952	<0.001**
After 6hrs.	82.44±7.75	88.24±7.69	3.507	<0.001**
After 8hrs.	83.87±8.19	89.79±8.11	3.445	<0.001**
After 10hrs.	82.66±7.97	88.52±6.40	3.846	<0.001**
After 12hrs.	83.39±5.00	91.39±4.54	7.946	<0.001**
After 14hrs.	86.85±8.51	93.02±5.12	4.168	<0.001**
After 16hrs.	87.55±5.66	90.67±4.29	2.947	0.004*
After 18hrs.	84.14±5.25	86.47±8.31	1.590	0.115
After 20hrs.	80.35±6.75	82.68±8.25	1.466	0.146
After 22hrs.	79.94±6.12	80.10±5.58	0.130	0.897
After 24hrs.	77.41±8.81	78.54±5.32	0.737	0.463

Using: t-Independent Sample t-test; * Significant; ** highly significant

Table 6 demonstrates a significantly higher VAS at rest in group B as compared to group A from after 4hrs, until the end of the time with p-value <0.05.

Table (6): Comparison between the study groups according to postoperative VAS at rest.

Visual Analogue Scale (VAS) at rest	Group A (n=45)	Group B (n=45)	Test value	P-value
PACU	0 (0-0)	0 (0-1)	1.201	0.468
After 30min.	1 (0-1)	1 (0-1)	0.826	0.722
After 1hr.	1 (0-1)	1 (1-2)	1.069	0.495
Surgical ward	1 (0-1)	2 (1-2)	1.513	0.408
After 2hrs.	2 (1-2)	2 (2-3)	1.913	0.085
After 4hrs.	3 (2-3)	4 (3-5)	4.839	<0.001**
After 6hrs.	2 (1-4)	3 (2-4)	2.373	0.046*
After 8hrs.	3 (2-4)	4 (3-5)	3.029	0.034*
After 10hrs.	2 (1-3)	3 (2-4)	4.169	<0.001**
After 12hrs.	2 (1-2)	3 (2-4)	2.896	0.042*
After 14hrs.	2 (1-2)	3 (2-4)	2.841	0.045*
After 16hrs.	2 (1-3)	3 (2-4)	4.970	<0.001**
After 18hrs.	3 (2-3)	4 (3-5)	5.435	<0.001**
After 20hrs.	1 (0-2)	2 (1-3)	2.314	0.047*
After 22hrs.	2 (1-3)	3 (2-4)	3.842	0.024*
After 24hrs.	2 (1-3)	3 (2-4)	3.980	0.013*

Using: Mann-Whitney test; * Significant; ** highly significant

Table 7 demonstrates a significantly higher VAS at activity in group B as compared to group A from after 4hrs, until the end of the time with p-value <0.05.

Table (7): Comparison between the study groups according to postoperative VAS at activity.

VAS at activity	Group A (n=45)	Group B (n=45)	Test value	P-value
PACU	1 (0-1)	1 (0-1)	0.860	0.705
After 30min.	1 (0-1)	1 (1-2)	0.933	0.653
After 1hr.	2 (1-2)	2 (1-3)	1.055	0.498
Surgical ward	2 (1-2)	3 (1-3)	0.896	0.680
After 2hrs.	2 (2-3)	3 (3-5)	1.772	0.127
After 4hrs.	3 (3-4)	5 (4-6)	2.864	0.043*
After 6hrs.	3 (2-3)	4 (3-5)	2.966	0.037*
After 8hrs.	4 (3-5)	5 (4-6)	5.241	<0.001**
After 10hrs.	3 (2-4)	4 (3-5)	3.947	0.017*
After 12hrs.	3 (2-3)	4 (3-5)	4.273	<0.001**
After 14hrs.	3 (2-3)	4 (3-5)	3.263	0.031*
After 16hrs.	3 (2-4)	4 (3-5)	4.395	<0.001**
After 18hrs.	4 (3-5)	5 (4-6)	4.640	<0.001**
After 20hrs.	2 (1-3)	3 (2-4)	5.140	<0.001**
After 22hrs.	3 (2-3)	4 (3-5)	3.404	0.026*
After 24hrs.	3 (2-4)	4 (3-5)	2.761	0.021*

Using: Mann-Whitney test; * Significant; ** highly significant

There was a high significant difference (P<0.001) between groups as regards analgesic duration (time of first call for analgesics) (min). The highest value was reported in Group A and Group B, this indicates that that the needs ofanalgesic in the Group B were earlier than in Group A (**Table 8**).

Table (8): Comparison between the study groups as regards analgesic duration (time offirst call for analgesics) "min".

Analgesic duration (time of first call for analgesics) (minutes)	Group A (n=45)	Group B (n=45)	Test value	P-value
Mean±SD	241.02±36.15	188.49±28.27	7.678	<0.001**
Range	189-268	152-242		

Using: t-Independent Sample t-test; **P-value <0.001 HS

There was a highly statistically significant difference between groups as regards cumulative morphine consumption "mg". The highest value was reported in Group B and GroupA 4 (3-4) and 2 (1-2) respectively, this indicates much higher needs of analgesic in the Group B than group A (**Table 9**).

Table (9): Comparison between the study groups as regards cumulative morphine consumption "mg".

Cumulative morphine consumption (mg)	Group A (n=45)	Group B (n=45)	Testvalue	P-value
Median (IQR)	2 (1-2)	4 (3-4)	4.563	<0.001**
Range	1-3	3-5		

Median and range: non-parametric test; **P-value <0.001 HS

Table 10 demonstrated a non-significant difference between groups as regards adverse effects ofPONV, Hypotension, Bradycardia, Drowsiness and Total Complications.

Table (10): Comparison between the study groups as regards side effect.

Side effect	Group A (n=45)	Group B (n=45)	Test value	P-value
PONV	1 (2.2%)	2 (4.4%)	0.337	0.561
Hypotension	1 (2.2%)	1 (2.2%)	0.000	1.000
Bradychardia	1 (2.2%)	2 (4.4%)	0.337	0.561
Drowsiness	0 (0.0%)	1 (2.2%)	0.990	0.320
Total Complications	3 (6.7%)	6 (13.3%)	1.077	0.299

Using: Fisher's Exact test; P-value >0.05 NS

DISCUSSION

In this trial, we examined the effects of adding DXM to 20 mL of BVC 0.25% for ACB with 0.9% saline (control group) in patients undergoing knee arthroscopy while under spinal anesthetic. Our study's findings showed that no significant differences were found in the beginning of sensory block between both groups, the dexamethasone group's sensory block lasted much longer and it took them longer to need their first painkiller. The VAS in the dexamethasone group was considerably lower at 4 hours, up to 24 hours postoperatively, both at rest and with activity, and the overall morphine amount as rescue analgesic.

Peripheral nerve blocks can be effectively treated with dexamethasone as an adjuvant. DXM is assumed to work by changing the pro-inflammatory response and might directly impact the nociceptive C-fibres, while the exact mechanism of action is uncertain [(8)]**.** According to **YaDeau *et al.*** [(9)]**,** when local anesthetics are combined with them, analgesia is prolonged either by causing vasoconstriction, which decreases local anaesthetic's absorption, or by enhancing the activity of inhibitory potassium channels on nociceptive C-fibers, which lengthens sensory and motor block.

According to **Chisholm *et al.*** [(10)]**,** the duration of postoperative analgesia after ACL reconstruction was considerably prolonged by 8–13 hours when DXM (1 and 4 mg) was added to subsartorial saphenous nerve block.

In addition, **Holland and his associates** [(11)] discovered that DXM perineurally lengthens the interscalene block regardless of dosage or mode of administration**.** Other reports, however, were inconsistent.

For instance, **Fredrickson-Fanzca *et al.*** [(12)] demonstrated that as compared to systemic dosing, perineural DXM was associated with a negligible impact on the quality and duration of BVC sciatic and ankle blockades. Notably, our research excluded dexamethasone systemic as a control group. This potential confounding impact could be brought on by the simultaneous spinal anesthesia used for the surgeries of our patients and also the various forms of nerve blocks**.**

The sciatic nerve is mostly motor when blocked, whereas ACB is a sensory block of femoral nerve below patient's thigh [(12)]**. Alarasan *et al.*** [(13)] also discovered that using DXM as an adjuvant to BVC in supraclavicular brachial plexus block (BPB) did not result in any significant variations in the timing of the start of sensory and motor block. Dexamethasone and bupivacaine both work on the same nociceptor C fibres that are enclosed in a single Schwann cell sheath through two distinct methods, which results in the closure of the pain gate and pre-emptive analgesia [(13)]**.**

One study showed that administering perineural DXM prolongs LA during BPB without causing any negative side effects [(14)]. As an adjuvant to BPB, **Sakae *et al.*** [(15)] discovered that perineural DXM was linked to a longer duration of analgesia compared with intravenous.

Abdallah *et al.* [(16)] came to the conclusion that ACB provides no inferior analgesia for individuals having anterior cruciate ligament repair and retains quadriceps femoris muscle strength when compared to femoral nerve block. Additionally, ACB retained quadriceps strength and mobility better than FNB, according to **Jaeger *et al.*** [(17)]**.**

The ACB can sustain a greater quadriceps power than the FNB, albeit with less analgesia, according to **El Ahl** [(18)]**.**

The DXM group greatly outperformed the control group in terms of the acceptable score. Consistent with **Chisholm *et al.*** [(10)]**,** it is most probable that the longer amount of time that block offered pain improvement, lower pain ratings during rest and activity, and reduced sleepiness and disorientation were all variables that led to the improved patient's satisfaction.

CONCLUSION

ACB is an effective postoperative analgesic for arthroscopic knee surgery performed under spinal anesthetic. DXM (8 mg) added to 0.25% BVC in ACB, however, resulted in improved postoperative analgesia that lasted longer and required fewer analgesics than bupivacaine alone.

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