(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume3, Issue 6, Page No: 613-624
November-December 2020

To Study Efficacy of Ultrasound Guided Supraclavicular Brachial Plexus Block For Upper Limb Orthopaedic Surgeries With 0.25% Bupivacaine Versus 0.25% Bupivacaine with Dexmedetomidine 50mcg as Adjunct

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Type of Publication: Original Research Paper
Conflicts of Interest: Nil

ABSTRACT

Background: Post operative pain following orthopaedic surgery can be severe and managing this type of pain following shoulder procedures is a challenge to both anaesthetists and the orthopedicians. In an attempt to offer better post operative analgesia and smoothen post operative progress of patient in terms of mobilization, regional anaesthesia by way of brachial plexus is frequently used either as an addition to general anaesthesia or as the primary anaesthetic modality.

Method: A prospective observational study which was conducted after obtaining informed written consent from the patients and after obtaining Institutional ethical committee approval. A total 100 cases subjects was consider for the study on prospective basis.Group 1(n=50): Patients in this group were administered ultrasound guided supraclavicular block with, 0.25% Bupivacaine(150mg) plus Dexmedetomidine 50mcg. The total volume of mixture was 30 ml.Group 2 (n=50) Patients in this group were administered ultrasound guided supraclavicular block with, 0.25% Bupivacaine(150mg) plain. The total volume of mixture was 30 ml.

Results: The time of onset for sensory block was significantly higher in group 2 as compared to group1 ; duration of sensory block in minutes ($p<0.01$) , motor block($p<0.01$) , Ramsay Sedation Score($p<0.01$) , total duration of analgesia ($p<0.01$), time request for first injectable analgesic inj ($p<0.01$) was found to be significantly higher in group 1 as compared to group 2 and statistically differ($p<0.01$).

Conclusions: Dexamedetomedine significantly prolonged the duration of analgesia when used with 0.25% bupivacaine during Supraclavicular block for arthroscopic surgery of shoulder. Dexamedetomedine also improved the quality of pain relief in the first 24 h post-operatively

Keywords: supraclavicular block , Bupivacaine, Dexmedetomidine, arthroscopic surgery

INTRODUCTION

Post operative pain following orthopaedic surgery can be severe[1] and managing this type of pain following shoulder procedures is a challenge to both anaesthetists and the orthopedicians. In an attempt to offer better post operative analgesia and smoothen post operative progress of patient in terms of mobilization, regional anaesthesia by way of brachial plexus is frequently used either as an addition to general anaesthesia or as the primary anaesthetic modality [1]. The brachial plexus

blockade by supraclavicular approach is rapid, complete and provides predictable anaesthesia for mid humerus, forearm and hand surgery. This approach is also known as spinal anaesthesia of the upper limb because of its common application for upper limb surgical procedures. The compact structure of the plexus is an added advantage to nerve block at these levels. Peripheral nerve blocks provide good operating conditions when it used optimally[2]. Over the past two decades, neuro stimulation was the gold standard technique for nerve identification in regional blocks. However, it does not ensure the required level of nerve block. It also causes damages to the nerve structures by a direct puncture. Ultrasound visualization of anatomical structures facilitates safe methods for regional blocks[3].This technique enables the anaesthetist to secure an optimal needle positioning and to monitor the distribution of local anaesthetic in real time. The amount of local anaesthetic required for effective nerve block can be minimized by directly monitoring its distribution. Numerous studies have evaluated the role of perineural catheters as a way to offer continuous brachial plexus pain relief [3]. Such catheters are placed in the perioperative period and then left in place for several days to provide a continuous supply of local anaesthetic to the nerves but secondary block failure can occur as a result of disconnection, and equipment troubleshooting [4]. Most of the local anaesthetic agents developed in the first half of the 20th century (1900-1940) were basically amino ester compounds. They lost their importance due to their shorter duration of action and associated allergic reactions and systemic side effects. This paved the way for synthesis of newer agents, namely, the amino amide compounds such as bupivacaine, levobupivacaine, and ropivacaine. For 0.25% bupivacaine or ropivacaine, the usual local anesthetics, previous studies report an average analgesic duration of 11 hours without epinephrine [5] and approximately 12 hours with epinephrine [6]. Bupivacaine offers greater sensory and motor separation. The decreased systemic toxicity is better when a potential for high concentrations of local anaesthetic agents is used in peripheral nerve block and epidural anaesthesia. Consequently, a method of prolonging analgesia from a brachial plexus block without the extra cost and logistical difficulties of indwelling catheters would benefit both patients and their care givers. One promising approach is use of adjuvant drugs that prolong block duration when added to the local anesthetics [6] . These adjuvant drugs added to peripheral nerve block are expected to enhance the duration of analgesia without causing any systemic adverse effects and prolonging motor blockade. Many drugs have been studied as adjuvants for single-injection regional anaesthetic techniques . Novel α-2 adrenergic agent, dexmedetomidine is eight times more selective for α-2 adrenoceptor than clonidine. It has an analgesic, sedative and good cardiovascular stabilizing effect [7].

AIMS AND OBJECTIVES OF THE STUDY

The aim of this study was to compare the efficacy of 0.25% Bupivacaine plain versus 0.25 % Bupivacaine with adjuvant Dexmedetomedine 50mcg on post operative analgesia by USG guided Supraclavicular block for upper limb orthopaedic surgeries.The salient objectives were as follows

Primary objectives

(i) Onset and Duration of analgesia (sensory blockade)

Secondary objectives

(i) Onset and duration of motor block

(ii)Postoperative analgesic requirements (rescue analgesia)

MATERIALS AND METHODS

Source of data and study design

A prospective observational study which was conducted at a Tertiary care hospital in southern part of india after obtaining informed written consent from the patients and after obtaining Institutional ethical committee approval . A total 100 cases subjects was consider for the study on prospective basis, open randomization was done based on the pipette random number table and lottery method . This study was conducted from Jan 2019- dec 2019 on the subjects or cases undergone elective upper limb orthopedic surgeries under supraclavicular brachial plexus block.

The following inclusion and exclusion criteria was employed as per the standard operating protocol

Inclusion criteria: The patients with ASA I and II aged between the 20-60 years, of either gender

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scheduled for elective upper limb orthopaedic surgeries were included

Exclusion criteria: Patient with history of severe cardiovascular, pulmonary, kidney, liver disease, neurological, psychiatric, neuromuscular disorder, infection/sepsis/allergy, pneumothorax, and peripheral neuropathy were excluded.

Methodology: Total 100 patients were visited on the day prior to the surgery and explained in detail about the anaesthetic procedure and written informed consent was obtained and also a detailed pre anaesthetic evaluation was done. Further, all cases were kept nil orally from 12 mid night prior to the day of surgery. On arrival of the patient in the pre-anaesthetic room, pre-procedure parameters like blood pressure, heart rate, and oxygen saturation were recorded and noted. In the opposite limb, an intravenous access will be obtained with 18G cannula and Ringer's lactate was started. In the operating room patients would be connected to monitors to record pulse, O_2 saturation, NIBP and ECG. Premedication with inj. Midazolam 0.05 mg/kg body weight before the procedure. Patients were positioned supine with arm placed by the side and the head turned 45° to the contralateral side to be blocked. All the blocks were performed using transportable ultrasound system (sonositemicromacx, Sonositeinc ,Bothell, WA,USA with a 38 mm 8-13MHz linear high frequency ultrasound transducer(HFL-38). 30ml solution for supraclavicular brachial plexus blockade would be administered. The study intervention was categorised two groups viz. 1

Group 1(n=50): Patients in this group were administered ultrasound guided supraclavicular block with, 0.25% Bupivacaine(150mg) plus Dexmedetomidine 50mcg. The total volume of mixture was 30 ml.Group 2 (n=50) Patients in this group were administered ultrasound guided supraclavicular block with, 0.25% Bupivacaine(150mg) plain. The total volume of mixture was 30 ml. After aseptic preparation of the area, at a point 1.5 to 2.0 cm posterior and cephalad to midpoint of clavicle, subclavian artery pulsations were felt. A skin wheel is raised with local anaesthetic cephalo posterior to the pulsations. Next, a 22 guage, echogenic needle needle introduced through the same point under ultrasound guided, parallel to head and neck, in a caudal, slightly medial and posterior direction, until either paraesthesia is elicited or first rib is encountered. If the rib is encountered, the needle would be moved over the first rib until paraesthesia is elicited in the arm or hand. After eliciting paraesthesia and negative aspiration of blood, keeping the needle in the same position the study medication would be injected slowly ruling out intravascular injection intermittently. An additional advancement of the needle 1 to 2 mm toward the brachial plexus may be beneficial to assure a proper spread of the local anaesthetic. Whenever the needle is further advanced, or multiple injections used, assure that high resistance to injection is absent to decrease the risk of an intrafascicular injection. The local anaesthetic solution was injected after careful aspiration, and spread was seen encircling the trunks. After injecting the local anesthetic, the block was tested for both sensory and motor and was compared with the contralateral side.Sensory block is evaluated by pin prick method with a 23 gauge needle using 3-point scale by the pin prick method.

After injecting the local anaesthetic drug, the sensory block was assessed at every minute in the dermatome areas corresponding to median nerve, radial nerve, ulnar nerve and musculocutaneous nerve until the completion of sensory blockade. The onset time was defined as the time between injection and complete loss of pin prick sensation in C_2 and T_2 dermatome and temperature testing using spirit soaked cotton on skin dermatomes C_2 to T_2. The time when complete sensory blockade achieved would be noted. Evaluation of motor block was done at every minute until complete motor blockade after drug injection. Evaluation of motor block was done by thumb abduction (radial nerve), thumb adduction (ulnar nerve), thumb opposition (median nerve), flexion of the elbow in supination, and pronation of the forearm (musculocutaneous nerve Motor block was assessed by Bromage three point score [0= normal motor function with full flexion and extension of elbow, wrist and fingers, 1= decreased motor strength with ability to move fingers and/or wrist only, 2= complete motor blockade with inability to move fingers]. The time when motor block achieved would be noted. Sedation of patient was assessed by the Ramsay sedation scale. Patients were assessed for

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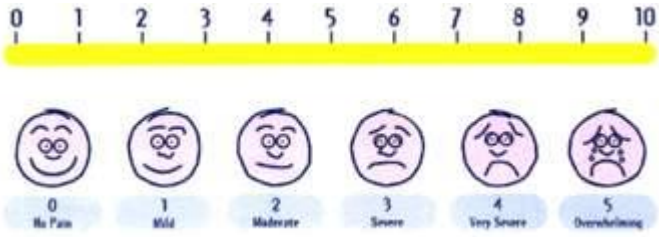
duration of analgesia as per VAS. After the surgery, it was monitored every 1 h until the score reaches 5.

Duration of sensory block (till appearance of pain requiring analgesia) and duration of motor block (till complete return of muscle power) would also be recorded. After the block patient was shifted to postoperative ward. The rescue analgesia was given with parental use of tramadol injection when the VAS reaches 5.The requirement for first rescue analgesic, the amount of total analgesic used, patient satisfaction and mobilization was noted in both the groups.

All patients are observed for any side effects such as nausea, vomiting, dryness of mouth and complications such as pneumothorax, hematoma, local anaesthetic toxicity and post-block neuropathy in the intra and post-operative periods. Time interval between the completion of local anaesthetic solution administration and the complete resolution of anaesthesia on all nerves is known as the duration of sensory block. The time interval between the completion of local anaesthetic administration and the recovery of complete motor function of the hand and forearm is known as the duration of motor block. The requirement for first rescue analgesic, the amount of total analgesic used, patient satisfaction and mobilization will be noted in both the groups. Side effects and complications would also be noted.

Pain relief was assessed by using Visual Analogue Scale



The vitals were recorded at baseline 5min, 10min, 15min, 20min, 25min, 30min, 45min, 60min and at 2hrs.

Statistical analysis: Collected data was analysed by using SPSS -16.50 versions, the ANOVA and Univariate analysis was employed to draw the significant inference.

Results: Data was collected from pre tested questionnaires' and entered into a Microsoft excel sheet. SPSS Software version 19.65 was used for the data analysis .All attributed data was expressed in percentage and mean values (age groups, gender etc.).The non categorical variables were analyzed by Univariate analysis - students `t` test. A qualitative data was analyzed by chi-square test. Statistical analysis was performed by using descriptive and inferential statistics. Logistic regression and unpaired t-test was used to compare the mean values between the two groups respectively .If P-value is less than 0.05 was considered as significant at 95% confidence level.

Table 1 Age Distribution of cases

Age	Group 1 (n=50)		Group 2 (n=50)		P-value
	N	%	n	%	
20-30 Yrs	12	24.00	16	32.00	≤0.01
31-40 Yrs	7	14.00	14	28.00	≥0.01
41-50 Yrs	15	30.00	13	26.00	≤0.01
51-60 Yrs	16	32.00	7	14.00	≤0.01
Total	50	100.00	50	100.00	

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Table 1 depicted that age was categorized based on the mean and SD .The mean age of the cases was 56.22 ±0.36 years. Majority of the cases distributed in the age group 41-50 (30.0%) and 51-60years (32.0%) and least was 31-40 years (14.0%) and 20-30years (24.0%).Age distribution was found to be comparable in both the groups p<0.01 .

Table 2: Gender wise Distribution of cases or subjects

Gender	Group 1 (n=50)		Group 2 (n=50)	
	n	%	n	%
Male	34	68.00	32	64.00
Female	16	32.00	18	36.00
Total	50	100.00	50	100.00

From table 2 clearly depicted a total 50 cases of each group was recruited for the study population, the male comprises in group 1 was 68.0%; female (32.0%) similarly in group 2 male was (64.0%) and female (36.0%) .The sex ratio was 1:2. Gender distribution in both the groups is similar and comparable for the inference

Table 3: Distribution of surgery induction for cases

Surgery	Group 1 (n=50)		Group 2 (n=50)		P-value
	N	%	n	%	
Implant removal	21	42.00	23	46.00	≤0.01
Arthroscopy+Bankart's repair	08	16.00	03	6.00	≥0.01
Orif+Plating	04	8.00	06	12.00	≤0.01
Rotator Cuff Injury	07	14.00	03	6.00	≤0.01
Fracture Lower end of Humerus+Orif	03	6.00	00	0.00	≤0.01
Fracture Mid Shaft of Humerus	00	0.00	08	16.00	≤0.01
Fracture upper end of Humerus	02	4.00	00	0.00	≥0.01
Diagnostic Arthroscopy+Proceed	03	6.00	02	4.00	≥0.01
Supracondylar Fracture	02	4.00	00	0.00	≥0.01
Arthroscopy+ Tendon repair	00	0.00	03	6.00	≤0.01
Fracture head of Humerus	00	0.00	02	4.00	≥0.01
Total	50	100.00	50	100.00	

From table 3 determined that , the type of surgery in association of the study objectives was correlated by using logistic regression analysis .As per the resulted findings types of surgeries was positively associated with objectives of the present research *viz* Implant removal (p<0.01) odds 1.1-2.89; Arthroscopy+Bankart's repair (p<0.01) odds 2.58-3.63; Orif+Plating (p<0.01) odds 4.75-5.86; Rotator Cuff Injury and Arthroscopy+ Tendon (p<0.01) odds

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1.1 -3.26 repair was found to be statistically significant with pooled odd ratio 1.1-2.58.

Table 4: Distribution of side effects

Side effects		Groups				odds	P-value
		Group 1 (n=50)		Group 2 (n=50)			
		n	%	n	%		
Nausea	Yes	00	0.00	01	2.00	0.28-0.98	0.22
	No	50	100.00	49	98.00		
Vomiting	Yes	00	0.00	03	6.00	0.32-0.46	0.147
	No	50	100.00	47	94.00		
pruritis	Yes	16	32.00	14	28.00	1.58-2.02	0.00
	No	34	68.00	36	72.00		
Shivering	Yes	16	32.00	14	28.00	2.33-3.12	0.00
	No	34	68.00	36	72.00		
Hematoma	Yes	00	0.00	01	2.00	0.26-0.29	0.455
	No	50	100.00	49	98.00		
Pneumothorax	Yes	00	0.00	02	4.00	0.38-0.42	0.185
	No	50	100.00	48	96.00		
Local anesthetic toxicity	Yes	00	0.00	01	2.00	0.35-0.39	0.236
	No	50	100.00	49	98.00		
Patient satisfaction and mobilization	Bad	00	0.00	25	50.00	0.33-0.38	0.185
	Good	00	0.00	25	50.00	0.21-0.23	0.236
	Excellent	50	100.00	00	0.00	0.45-0.258	0.113
Others	Yes	0	0.00	0	0.00	0.63-0.85	0.362
	No	50	100.00	50	100.00		

From table 4 determined that distribution of side effects, it was correlated by logistic regression analysis .As per the findings pruritis; Shivering was found to be significantly associated with subjects ($p<0.05$) and rest of the parameters were negatively correlated ($p>0.05$).Group1wasfound to be statistically significantly differ ($p<0.05$)

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Table 5: Blood pressure correlation subjects of group 1 and group2

Sl	Variables	Group1 Mean±SD (n=50)	Group2 Mean±SD (n=50)	p-value
1	Weight(Kgs)	57.24±7.87	63.74±7.48	<0.001
2	PREOPsystolic bp	117.52±10.15	112.80±9.57	0.019
3	PREOPdiastolic bp	66.04±5.92	69.80±4.59	0.001
4	0minssystolic bp	116.80±9.89	109.56±8.55	<0.001
5	0minsdiastolic bp	66.04±5.92	69.56±3.90	0.001
6	2 minssystolic bp	110.16±10.254	113.68±10.36	0.095
7	2 minsdiastolic bp	66.04±5.92	69.56±3.90	0.001
8	4minssystolic bp	113.28±8.37	116.24±7.46	0.065
9	4minsdiastolic bp	66.48±5.86	68.96±5.54	0.032
10	8minssystolic bp	112.20±8.33	115.28±7.69	0.058
11	8minsdiastolic bp	66.04±5.92	69.56±3.90	0.001
12	10mins systolic bp	113.40±9.31	118.20±8.10	0.007
13	10mins diastolic bp	66.04±5.92	69.56±3.90	0.001
14	20mins systolic bp	117.68±8.60	115.36±7.94	0.164
15	20mins diastolic bp	66.04±5.92	69.56±3.90	0.001
16	40mins systolic bp	117.52±10.15	111.96±10.26	0.008
17	40mins diastolic bp	64.12±5.46	66.28±7.21	0.094
18	50mins systolic bp	112.20±8.33	115.28±7.69	0.058
19	50mins diastolic bp	66.04±5.92	69.56±3.90	0.001
20	60mins systolic bp	112.20±8.33	115.28±7.69	0.058
21	60mins diastolic bp	66.04±5.92	69.56±3.90	0.001
22	70mins systolic bp	112.20±8.33	115.28±7.69	0.058
23	70mins diastolic bp	66.04±5.92	69.56±3.90	0.001

Blood pressure correlation subjects of group I and group II was done from ANOVA repeated measures. The mean body weight of the person was 57.24 kgs +/ 7.48 kg. In case of Blood pressure the pre OP mean Systolic/Diastolic pressure was 111.75/ 112.80 successively correlated BP from induction to 70 minutes follow up. From induction to up to 70 minutes follow up the BP was found to be significantly correlated. There is significant difference in mean diastolic BP at all the time points (p-value <0.05) except at time 40 min (p-value 0.094). Whereas, in systolic BP there is a in significant difference at all time points except at 10 min and 40 min Table 5.

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Table 6: Mean values of heart rate

Sl	Variables	Group1 Mean±SD (n=50)	Group2 Mean±SD (n=50)	P-value
1	Pre OP	78.38±7.67	72.52±9.65	0.001
2	0mins	78.26±6.06	80.70±7.08	0.067
3	2 mins	78.20±7.04	79.34±6.11	0.389
4	4mins	78.76±5.61	76.24±4.52	0.015
5	8mins	75.08±5.88	77.16±4.74	0.054
6	10mins	75.90±7.41	76.72±10.04	0.643
7	15mins	75.70±6.98	72.86±4.37	0.017
8	20mins	74.78±5.93	72.24±3.72	0.012
9	25mins	75.54±5.82	75.96±5.17	0.704
10	30mins	78.22±5.67	81.10±4.55	0.006
11	40mins	79.22±7.28	77.70±6.29	0.267
12	50mins	78.92±5.67	76.64±4.91	0.034
13	60mins	75.34±5.81	73.82±7.06	0.242
14	70mins	75.50±7.13	76.00±10.38	0.779
15	80mins	75.50±7.13	76.00±10.38	0.779

Table 6 shows ,the mean values of heart rate at the time of OP and induction of surgery with different follow up means was compared with group 1 versus group 2 .As per the resulted findings the mean heart rate of group 1 cases at the time of pre OP was 78.38± 7.67 per minutes ,similarly in group 2 72.52 ± 9.65 minutes. There is significant difference in heart rate at highlighted point of time with ($p< 0.05$). Observed that, the time of induction. 2 minutes ; 4 minutes ; 8 minutes and up to 20 minutes heart rate has consistently maintained with respect to age and gender of the subjects , it was found to be statistically significant ($p<0.01$).

Table 7: VAS means score significance

Sl	VAS score	Group1 Mean±SD (n=50)	Group2 Mean±SD (n=50)	p-value
1	1hr	1.00±0.00	1.00±0.00	-
2	2hr	1.00±0.00	2.00±0.00	-
3	3hr	1.00±0.00	2.40±0.45	<0.001

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4	4hr	1.00±0.00	3.40±0.49	<0.001
5	5hr	1.26±0.44	4.00±0.00	<0.001
6	6hr	1.26±0.44	4.40±0.49	<0.001
7	7hr	1.26±0.44	4.60±0.49	<0.001
8	8hr	1.26±0.44	5.00±0.00	<0.001
9	9hr	1.76±0.43	5.00±0.00	<0.001
10	10hr	2.00±0.00	5.00±0.00	-
11	11hr	2.00±0.00	5.00±0.00	-
12	12hr	2.26±0.44	5.00±0.00	<0.001
13	13hr	3.00±0.00	5.00±0.00	-
14	14hr	3.26±0.44	5.00±0.00	<0.001
15	15hr	3.74±0.44	5.00±0.00	<0.001
16	16hr	4.00±0.73	5.00±0.00	<0.001
17	17hr	4.50±0.251	5.00±0.00	<0.001
18	18hr	4.74±0.44	5.00±0.00	<0.001
19	19hr	4.74±0.44	5.00±0.00	<0.001
20	20hr	5.00±0.00	5.00±0.00	-
21	21hr	5.00±0.00	5.00±0.00	-
22	22hr	5.00±0.00	5.00±0.00	-
23	23hr	5.00±0.00	5.00±0.00	-
24	24hr	5.00±0.00	5.00±0.00	-

Table 7 shows, the mean values of VAS mean score at the time of OP and induction of surgery with different follow up means was compared with group 1 versus group 2 .As per the resulted findings the mean rate of VAS mean score group 1 cases at the time of pre OP was 1.00± 0.00($p<0.01$), similarly in group 1.00 ± 0.00($p<0.01$).There is a significant difference was found in VAS score irrespective of duration as compared with group 1 and 2 respectively($p<0.01$).

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Table 8: Associated parameters correlation

Parameters	Group 1 Mean±SD (n=50)	Group 2 Mean±SD (n=50)	P-value
Time of onset for sensory block (min)	66.04±2.92	76.00±2.30	<0.001
Duration of sensory block in minutes	1065.60±23.16	420.00±21.21	<0.001
Onset for motor block (min)	102.08±6.95	103.48±6.07	0.486
Duration of motor block in minutes	930.00±57.18	270.00±30.30	<0.001
Ramsay Sedation Score	3.76±0.65	2.16±0.74	<0.001
Total duration of analgesia	1065.60±18.16	420.00±14.21	<0.001
Duration of surgery (min)	231.60±5.12	226.80±5.24	0.643
Time request for first injectable analgesicInj. Tramadol 50mg I.V)	1065.60±91.16	420.00±54.21	<0.001
Total amount of Inj Tramadol administered	50.00±0.12	120.00±0.74	<0.001

Table 8 shows that, the associated parameters of subjects was done based on the logistic regression analysis, the results was showed that at the time of onset for sensory block is significantly higher in group 2 as compared to group; duration of sensory block in minutes ($p<0.01$) , motor block($p<0.01$) , Ramsay Sedation Score($p<0.01$) , total duration of analgesia ($p<0.01$), time request for first inject able analgesicInj ($p<0.01$) ; total amount of Inj Tramadol administered was found to be significantly higher in group 1 as compared to group 2 and statistically differ($p<0.01$). And also there is a insignificant difference was seen in total time of surgery ($p>0.01$).

DISCUSSION: The present study demonstrated that, Dexmedetomedine significantly prolonged the duration of analgesia of bupivacaine in supraclavicular brachial plexus block. This finding was generally consistent with previous studies done by (Kuthiala et al.2011) (El.Hennway et al.2000) [4] We observed 2.0-fold prolongation of analgesia in Group 1 as compared with Group 2 almost similar to findings reported (Cummings et al.2010) [8] he observed that a 1.9-fold increase in the duration of ISB when Dexmedetomedine was mixed with local anaesthetic.

We observed that mean VAS score and rescue analgesic consumption was significantly less when dexamedetomedine was mixed with bupivacaine. A recent systematic review has shown that dexmedetomedine significantly reduces the VAS score and analgesic consumption when used along with local anaesthetic however, the duration of significant relief is variable[6]. In our study, all two groups were comparable with respect to demographic data, gender, oxygen saturation ($p<0.01$) and ASA class distribution. Bernard et al[6] reported significant sedation with the use of clonidine than with plain local anaesthetic. Sedation was not specifically studied in our study as all patients were premeditated with midazolam and hence could interference with the study.

In study reported by Murphy et al[7] found that the motor block was also prolonged from 6.22 ± 1.43

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hours in saline group to 10.41 ± 1.18 hours in clonidine group and to 17.19 ± 2.13 hours in dexamethasone group. This was also highly significant (p=0.0001 We compared our results of group 1 with previous studies. Studies done by Singelyn et al[10] and review of studies done by Murphy et al[9](24 studies), McCartney et al[11](27 studies) and a meta-analysis by Popping et al[12]in 2009 had also observed a significant prolongation of analgesia and muscle relaxation when clonidine was added to local anaesthetics. This is in contrary to the conclusions by Erlacher et al,[13] who observed no significant prolongation of analgesia with the addition of clonidine to local anaesthetics.

We compared our results of dexamethasone group with a recent meta-analysis in 2014 by Choi et al.[14] They analysed nine randomised controlled trials (801 patients), in which 393 patients received dexamethasone (4-10 mg). They observed significantly (p<0.01) prolonged duration of analgesia when dexamethasone has administered along with long-acting local anaesthetics. The extended motor blockade did create panic in some of our patients, but they were properly educated and reassured about the same. This may adversely affect the routine use of dexamethasone in brachial plexus blocks in daycare surgeries.

More and more studies on the application of dexmedetomidine as an adjuvant to enhance the effect of peripheral nerve block are ongoing. There were 2 meta-analysis studies focused on the effect of dexmedetomidine as an adjuvant to local anesthesia in BPB. However, not only bupivacaine but also levobupivacaine, bupivacaine, lidocaine were included in the global studies. As a result of the meta-analysis findings, the addition of dexmedetomidine did prolong the duration both in sensory and in motor block, at the same time reduce the sensory and motor block onset time significantly, and the effect was not associated with the dose of dexmedetomidine. When subgroups performed in the condition of different dose of dexmedetomidine and location for the BPB, there was no significant difference.

A previous meta-analysis showed that >50mcg of dexmedetomidine combined with local anesthetic drugs can more significantly produce motor and sensory block in BPB [15] However, in the subgroup analysis, high doses (>50mcg) and low doses (<50mcg) of dexmedetomidine all improved BPB. This suggests that the effect of bupivacaine for BPB may not be related to the dose of dexmedetomidine. The optimal dosage of dexmedetomidine has not been confirmed as an adjuvant to BPB. The result in Jung et al [13] research showed that 2mg/kg was the most optimal dosage for BPB after compared with 1 and 1.5mg/kg. More trials should be designed to investigate the effect of dose dependent for dexmedetomidine in peripheral nerve block. No differences in anthropometric parameters and hemodynamic variables were observed throughout the study, and no signs of central nervous system (CNS) and cardiovascular toxicity, or other untoward events were reported in any patients. Readiness for surgery was obtained after 28 +/- 15 min with 0.25% bupivacaine and 22 +/- 8 min after 0.25% bupivacaine (p = NS). No differences in postoperative pain relief were observed between the two groups (11.1 +/- 5 hrs after 0.25% bupivacaine and 10.9 +/- 3.9 hrs after 0.25% bupivacaine, respectively). This study confirmed that 0.25% bupivacaine has clinical properties similar to those of 0.25% bupivacaine, when used for supraclavicular brachial plexus block, providing similarly long duration in postoperative pain relief. Compared with bupivacaine, bupivacaine has the further advantage of a lower potential for central nervous system and cardiovascular toxicity.

CONCLUSION

Dexamedetomedine significantly prolonged the duration of analgesia when used with 0.25% bupivacaine during Supraclavicular block for arthroscopic surgery of shoulder. Dexamedetomedine also improved the quality of pain relief in the first 24 h post-operatively. None of the patient have not been reported any serious complications and adverse reaction. Thus, summing of the resulted findings the present conclude that that, an supraclavicular brachial plexus block in addition of dexmedetomidine as adjuvant to 0.25% bupivacaine shortens the onset time for sensory and motor block, prolongs both sensory and motor block duration at larger extent. It also found significantly delayed the first demand for analgesia supplementation, decreased at 24 hours analgesic consumption and is not associated with any major side-effects whatsoever.

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