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A CLINICAL COMPARISON BETWEEN EFFICACY O 0.5%LEVOBUPIVACAINE AND 0.5% LEVOBUPIVACAINE WITH DEXAMETHASONE 8 MG COMBINATION IN BRACHIAL PLEXUS BLOCK BY THE SUPRACLAVICULAR APPROACH

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ABSTRACT

Background: When used in conjunction with bupivacaine to block the supraclavicular brachial plexus (SCBP), dexamethasone prolongs the motor and sensory blockade. The effect of dexamethasone (8 mg) when combined with levobupivacaine, on the other hand, has not been well investigated.

Aim: To determine the role of dexamethasone as an adjuvant to levobupivacaine in ultrasound guided SCBP block.

Materials and methods: Comparison of efficacy of levobupivacaine and levobupivacaine with dexamethasone in supraclavicular brachial plexus block was undertaken to compare duration of analgesia, requirement of rescue analgesics and the onset and duration of sensory and motor block among 2 groups. Patients in age group 18 to 60 years belonging to either sex of ASA class 1 or 2 posted for upper limb surgeries were divided into 2 groups of 30 patients each. **Group S**: 25 ml of 0.5% Levobupivacaine + 2ml Normal Saline **Group D**: 25 ml of 0.5%Ropivacaine + 2ml (8mg) Dexamethasone.

Results: There was no statistically significant difference in demographic data, duration of surgery, and hemodynamic parameters between the study groups. There was statistically highly significant difference in between the groups in terms of onset and duration of sensory and motor block and duration of analgesia (time to first rescue analgesia) and total number of rescue analgesics used.

Conclusion: Addition of dexamethasone to 0.5% levobupivacaine shortens the onset of sensory and motor block and increases the duration of sensory and motor block as well duration of analgesia in comparison to levobupivacaine alone in Supraclavicular Brachial Plexus Block for upper limb surgeries.

Keywords:Dexamethasone, Levobupivacaine, Hemodynamic parameters

INTRODUCTION

Pain is unpleasant effect associated with significant psychological and physiological changes during surgery and post-operative period. [1]This can be overcome using suitable drugs and techniques. Regional anaesthetic techniques have specific advantages both for standalone anaesthesia and as analgesic supplements for intraoperative and postoperative care. An ever-increasing demand for regional anaesthesia from patients and surgeons matches the growing realization that regional anaesthesia can provide superior pain management and perhaps improve patient outcomes to meet evolving expectations for ambulatory, cost-effective surgery. Our aging population presents with an increasing range of co-morbidities, demanding a wider choice of surgical anaesthesia options including the use of a variety of regional techniques in conjugation with general anaesthesia to optimize clinical care, while at the same time reducing the risks of complications. Thus, the practice of regional anaesthesia

remains an art for many practitioners and consistent success with these techniques often appears to be limited to anaesthesiologists who are regional anaesthesia enthusiasts.[2]
Regional Anaesthesia in the form of supraclavicular approach to the brachial plexus is often used for orthopedic surgeries of the upper limb. It is often used either as an adjuvant to general anaesthesia or as the primary method of anaesthesia. With the introduction of newer and safer local anaesthetics with better advantages, regional anaesthesia has taken over as the principal technique for upper limb surgeries. The use of brachial plexus block as the primary anaesthetic technique avoids the complication associated with general anaesthesia. Indications for supraclavicular blocks include operations on the distal humerus, elbow, forearm, and hand. Blockade occurs at the distal trunk-proximal division level of the brachial plexus.[3]
The supraclavicular block is performed at a level of the brachial plexus trunks where almost entire sensory, motor, and sympathetic innervations of the upper extremity is confined to a very small surface area. Consequently, typical features of this block include rapid onset, predictable and dense anaesthesia. Satisfactory surgical conditions are obtained with complete sensory and motor blockade. Concurrent sympathetic blockade reduces post-operative pain, vasospasm, and oedema·
The supraclavicular block has the most widespread extent of sensory blockade among all the brachial plexus approaches, but the potential risk of pneumothorax decreased its popularity. The improved safety afforded by ultrasound location and the visualization of pleura and needle position has been the turning point in the increased use of this approach. Long acting local anaesthetic agent, Levobupivacaine, is frequently used for brachial plexus anaesthesia. Levobupivacaine has less systemic toxicity than bupivacaine. Its limiting factors are late onset and limited duration of analgesia even when used with adjuvants like opioids that produce opioid-related side effects. Studies have shown that dexamethasone can prolong the effect of regional anesthesia. Dexamethasone as an adjuvant may avoid opioid-related side effects. There is limited literature available regarding the use of dexamethasone as an adjuvant to levobupivacaine. Hence, the study is designed to assess the analgesic efficacy of dexamethasone as an adjuvant to levobupivacaine in ultrasound guided SCBP block.

PATIENTS AND METHODS

Hospital based Interventional study done January 2020 to January 2021 in Patients admitted in Gandhi Hospital, for surgery
Inclusion Criteria : American Society of Anaesthesiologist Grade I or II status, Age 18–60years of either gender Posted for elective or emergency upper limb
Exclusion Criteria : Obese and short neck, with coagulopathy (abnormal BT, CT) or patient on anticoagulants therapy, Neuropathy, Local infection at the site for block , Those with a history of allergy to the study drug, History of drug abuse and An anticipated operative time more than 2 hours
The sample size was calculated based on previous studies to detect a significant difference in the ‘time needed for first rescue analgesic’, assuming a power of 80% and a significance level of 5%. With 'time needed for first rescue analgesic' as the primary end point of the study, with Ώ± error of 0.05 and power of the study (1− $\Omega\acute{}^2$) at 80%, sample size was calculated as 27 in each group. We included thirty patients in each group to compensate for possible dropouts.
Detailed pre-anaesthetic evaluation was performed on the day before surgery.
The study protocol was approved by institutional ethical committee.
Sixty patients were divided into two groups with thirty each (Group S, n = 30 and Group D, n

= 30)
Group S (30) received 25 mL 0.5% Levo-Bupivacaine plus 2 mL normal saline **Group D** (30) received 25 mL 0.5% Levo-Bupivacaine plus 2 mL Dexamethasone (8mg) around the brachial plexus.

Pre-Anaesthetic evaluation
All the patients underwent thorough pre anaesthetic evaluation on the day prior to surgery. All systems were examined including airway and the surface anatomy where the block was going to be given, and the procedure to be carried out was explained and informed written consent taken. They were informed about development of paraesthesia. Patients were reassured to alleviate their anxieties. All the patients were kept nil per oral as per the fasting guidelines
All patients were given oral alprazolam 0.25 mg and ranitidine 150 mg on the night before the surgery and kept fasting overnight. The basic investigations were done for all patients. Next day on arrival of patients in the operating room, an 18-gauge intravenous cannula was inserted under local anaesthetic infiltration on the non-operating hand and an infusion of Ringer lactate was started. The patients were connected to multiparameter monitor (Phillips Intellivue MX450) which records pulse rate (PR), non-invasive measurements of systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial blood pressure (MAP), continuous electrocardiogram (ECG) monitoring using lead II and 58 oxygen saturation (SpO2). The baseline blood pressure and heart rate and oxygen saturation were recorded.
The SCBP block was performed using a portable ultrasound machine with a linear ultrasound transducer (8–13 MHz). Under all aseptic precautions with the patient in supine position, the affected arm adducted, and head turned to the contralateral side, the brachial plexus was visualised by putting the transducer in the supraclavicular fossa behind the middle third of the clavicle. Using a 25- to 27-gauge needle, 1–2 mL of local anaesthetic was injected into the skin 1 cm lateral to the transducer to decrease discomfort during needle insertion. The needle was then advanced under ultrasound guidance using an in-plane approach from lateral to medial. The plexus appeared as a cluster of grapes (5–6 hypoechoic circles) but in some as 3 hypoechoic circles with the hyperechoic outer ring, located lateral and superior to subclavian artery between anterior and middle scalene muscles.After negative aspiration, a small test dose was administered. Local anaesthetic spread around the brachial plexus confirmed appropriate placement of needle tip. The drug solution based on group allocation was injected after negative aspiration.
Group S (30) received 25 mL 0.5% levobupivacaine plus 2 mL normal saline, and Group D (30) received 25 mL 0.5% levobupivacaine plus 2 mL dexamethasone (8 mg) around the brachial plexus.Throughout the procedure patient was observed for development of toxicity and immediate side effects like hypotension. After the block was given patient was evaluated for onset of sensory and motor block, quality of sensory and motor block, overall quality of block, duration of sensory and motor block, duration of analgesia, side effects and complications. Assessment was done every 2 minutes till development of sensory and motor block.
Sensory blockade was assessed by pinprick method. Block of the median and ulnar nerves were assessed by testing the palmar surfaces of the index and little finger, respectively, and the dorsal surface of thumb used to test block of the radial nerve until development of block. The block was considered as **failed block** when at least two of the four nerves (radial, median, ulnar and musculocutaneous) were not affected even after 30 min after performing the block.

The performance of block, intra operative parameters and post-operative analgesia were monitored. Post-operative analgesia was monitored as per a numeric rating scale of 0–10 at every hour up to 24 hours. When the numerical rating scale score was 5 or more, it was considered that analgesic action of the block had terminated, and injection tramadol 100 mg intravenously was given as rescue analgesia.

At every assessment patient was observed for development of any adverse effects. HR, SBP, DBP and SpO2 were recorded pre-operatively before drug administration, at 0 min (just after drug administration), 15 min, 30 min, 45 min, 60 min.

Grading of sensory block done as:

- Grade 0: Normal sensation to pin prick.
- Grade 1: Dull sensation to pinprick.
- Grade 2: No sensation felt.

LOVETT RATING SCALE[4] – Assessment of motor blockade

Score	Assessment
6	Normal muscular force
5	Slightly reduced muscular force
4	Pronounced reduction of muscular force
3	Slightly impaired mobility
2	Pronounced mobility impairment
1	Almost complete paralysis
0	Complete paralysis

The onset of motor block: the time between completion of local anaesthetic injection and complete paralysis.

Duration of motor block: the time interval from complete paralysis to complete recovery of motor function.

As per complaint of surgeon and patient, the quality of the operative condition was monitored on the following scale:

- Grade 4: No complaint (excellent)
- Grade 3: Minor complaint (good)
- Grade 2: Complaint requiring analgesics (moderate)
- Grade 1: Patient given general anaesthesia (unsuccessful).

Quality of over all block: An overall assessment of quality of block will be made as a three-point scale as Complete failure,Unsatisfactory block (inadequate analgesia, inadequate relaxation, patients requiring general anaesthesia because of restlessness) and Satisfactory block (complete sensory and motor blockade)

Statistical methods

Continuous variables (age, weight) were presented as Mean + SD. Categorical variables (sex, complications) were expressed in actual numbers and percentages. Continuous variables were compared between the two groups by performing un– paired t-test. Categorical variables were compared by performing Chi–Square test. For small numbers Fisher exact test was used wherever necessary. Statistical software SPSS version 26 was used for data analysis.

P value< 0.05 statistically significant
P value < 0.001 statistically highly significant. P value> 0.05 – Statistically not significant

RESULTS

Block was successful in all the patients, and all the enrolled patients completed the study.

Table -1: Demographic characteristics of study population

	Levobupivacaine	**Levobupivacaine+ Dexamethasone**	

	Mean	SD	Mean	SD	p-value
Age	34.7	+ 12.73	36.37	+12.84	0.616
Sex (M/F)	19 (63.3%) / 11 (36.7%)		24 (80%) / 6 (20%)		0.252
Weight	64.6	+ 6.68	65.13	+6.34	0.752
ASA-1	22	73.3	25	83.3	0.5
ASA-11	8	26.7	5	16.7	0.8

There were no statistically significant differences in demographic profile of patients in either group in terms of age, body weight, or gender ratio and ASA grade ($p > 0.05$).The average age was 34.7+ 12.73years in S group and 36.37+ 12.84 years in D group. Average body weight 64.6±6.68 kg in S group and 65.13±6.34 kg in D group. Both the groups had predominantly male patients.

Table-2: Onset and duration of block in study

	Levobupivacaine		Levobupivacaine+ Dexamethasone		
	Mean	**SD**	**Mean**	**SD**	**p-value**
Sensory block-onset (min)	7.23	+ 0.73	4.07	+ 0.64	< 0.001
Motor block-onset (min)	8.87	+ 0.73	5.97	+ 0.67	< 0.001
Duration of block (min)					
Sensory block- duration (min)	171.67	+ 13.54	400.33	+ 23.34	< 0.001
Motor block-duration (min)	153.83	+ 14.43	322	+ 29.47	< 0.001

Onset of sensory block in Levobupivacaine group was 7.23 ± 0.73 min whereas in Levobupivacaine + Dexamethasone group it was 4.07 ± 0.64 min, which was highly statistically significant ($P < 0.001$) Onset of motor block in Levobupivacaine group was 8.87+ 0.73 min whereas in Levobupivacaine + Dexamethasone, it was 5.97+ 0.67min, which was highly statistically significant ($P < 0.001$). Duration of sensory block in Levobupivacaine group was 171.67 ± 13.54 min whereas in Levobupivacaine + Dexamethasone group it is 400.33 ± 23.34 min, which is highly significant ($P < 0.001$). Duration of motor block in Levobupivacaine group was 153.83 ± 14.43 min whereas in Levobupivacaine + Dexamethasone group it is 322±29.47 min, which is highly significant ($P < 0.001$).

Table-3: Time to first rescue analgesia between the two groups

	Levobupivacaine		Levobupivacaine+ Dexamethasone		
	Mean	**SD**	**Mean**	**SD**	**p-value**
Time to request for first rescue analgesia	424.17	+ 36.08	676	+ 37.79	< 0.001

Time to request for first rescue analgesia in Levobupivacaine group was 424.17 ± 36.08 min whereas in Levobupivacaine + Dexamethasone it is 676 ± 37.79min, which is statistically highly significant ($P<0.001$).

Table-4: Total number of rescue analgesics in first 24hrs of post-operative period

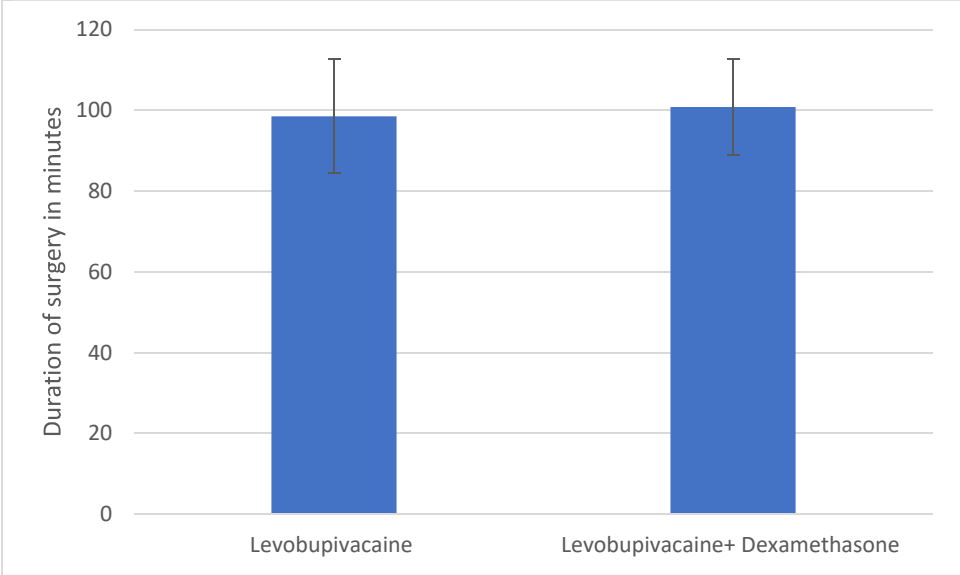
Overall quality of block

	1	2	3	TOTAL
GROUP-S	0	16(53%)	14(46%)	30

GROUP-D	12(40%)	10(33%)	8(27%)	30
TOTAL	12	26	22	60

There was no case of failed block or patchy block in our study. None of the patients of either groups required supplemental analgesia or general anaesthesia intraoperatively.

Figure-1: Duration of the surgery (min)



The duration surgery in both the groups was insignificant (P=0.491) so they werecomparable.

Table-5: Comparision of hemodynamic parameters in both groups

	Levobupivacaine		**Levobupivacaine+ Dexamethasone**		
Parameters	**Mean**	**SD**	**Mean**	**SD**	**p-value**
HR (min)	79.49	+6.55	81.11	+ 4.08	0.252
SBP (min)	121.82	+ 5.90	191.32	+ 4.00	0.060
DBP (min)	79.54	+ 4.27	77.69	+ 3.52	0.072
MAP (min)	93.63	+ 4.63	91.57	+ 3.56	0.058
SPO2 (min)	99.89	+ 0.16	99.97	+ 0.003	0.005

The hemodynamic parameters i.e., Heart rate, SBP, DBP and MAP were statistically insignificant between the levobupivacaine and levobupivacaine with dexamethasone groups since (P>0.05). Though the difference in SPO2 between the two groups is statistically significant, it is not clinically significant.

DISCUSSION

In recent years, there has been a growing interest in the practice of regional techniques and, peripheral nerve blocks for surgical anaesthesia and postoperative analgesia. The development of local anaesthetic agents with lower toxicity and long duration of action had contributed to this change. Compared with general anaesthesia, regional anaesthesia is associated with multiple benefits including reduced morbidity and mortality.

After going through the relevant literature regarding the use of dexamethasone as an adjuvant to local anaesthetics, it was hypothesised that addition of dexamethasone to levobupivacaine for supraclavicular brachial plexus block, will be effective in prolonging the duration of analgesia.

In our study, the drugs selected for brachial plexus block were levobupivacaine and dexamethasone. Levobupivacaine has a higher toxic threshold, produces less cardiac and central nervous system effects compared to bupivacaine and hence selected as the local anaesthetic for our study. To increase the duration of post-operative analgesia, various adjuvant drugs are used along with local anaesthetic agents. Adjuvants include Epinephrine,Clonidine, Opioids, Ketamine and Midazolam. [5] But all have met with limited success and the increase in the incidence of side effects were noted. Dexamethasone, as an adjuvant appears to be effective in prolonging the duration of analgesia of supraclavicular block, with the effect being stronger with levobupivacaine.
Despite concern surrounding 'off label' use of perineural adjuvants, the safety profile of dexamethasone is promising.Additionally, corticosteroids have a long history of safe use in the epidural space for the treatment of radicular pain arising from nerve root irritationand dexamethasone specifically has been studied as an adjuvant to epidural local anaesthetics.An in vitro study by Ma et al. actually demonstrates that dexamethasone decreases the neurotoxicity of bupivacaine.[7]
In fact, the use of dexamethasone as an adjuvant to local anaesthesia for nerve blocks is discussed in prominent textbooks.[7,8] Hence in our study dexamethasone was selected as an adjuvant to levobupivacaine for studying the effectiveness in prolongation of the duration of analgesia.

Concentration of Levobupivacaine selected

Wonkyo Kim et al conducted a study to study the effects of different concentrations of levobupivacaine in brachial plexus block and concluded that 0.375% levobupivacaine produced adequate anaesthesia for Axillary Brachial Plexus Block using Ultrasound guidance with nerve stimulation, without any clinically significant differences compared to 0.5% levobupivacaine.[9]
Cenk Ilham et al conducted a study to compare efficiency of 0.5% levobupivacaine and 0.5% bupivacaine for supraclavicular block, in which they concluded that 30ml 0.5%bupivacaine and levobupivacaine provide similar block characteristics for supraclavicular block. [10] Baskan et al conducted a study in which they compared 0.25% bupivacaine and 0.25% levobupivacaine in interscalene block and they found no significant difference in the block characteristics.[11]However not many studies have compared different concentrations of levobupivacaine in supraclavicular brachial plexus block.Hence in our study, we selected 0.5% as the concentration of levobupivacaine.
While performing SCBP block by paraesthesia technique, many anaesthesiologists tend to use large volume (30–40 mL) of local anaesthetics to improve success rates and prolong sensory and motor block. However, this leads to complications such as phrenic nerve palsy and Horner's syndrome due to unusual spread and increases the chances of systemic local anaesthetic toxicity. Lower volume of local anaesthetics may produce either shorter duration of block or incomplete block. Ultrasound guided SCBP block enables adequate block with lower volume of local anaesthetic compared to blind techniques.
Also, addition of adjuvants can help in reducing the dosage of local anaesthetics in peripheral nerve blocks.
The recommended maximum dose for levobupivacaine is 5mg/kg body weight in peripheral nerve blocks. This dose recommendation serves only as a base upon which a person using the drug in the technique should apply a sensible judgment and make appropriate adjustment.In our study 25ml of 0.5% levobupivacaine was chosen, keeping in mind that it should not exceed the safe dose of 3ml/kg body weight.A meta-analysis concluded that dexamethasone produced late onset of sensory and motor block with prolongation of motor block duration

and that the smaller doses of dexamethasone (4-5mg) were as equally effective as higher doses of dexamethasone (8-10mg).[54] However, the meta-analysis did not analyse any study using dexamethasone (8 mg) with levobupivacaine in supraclavicular brachial plexus block. Most studies in the literature used dexamethasone in a dose of 8 mg to augment peripheral nerve block analgesia, so we used 8mg of dexamethasone as an adjuvant in our study.

In our study, onset of sensory block in levobupivacaine group was 7.23 ± 0.73 min whereas in levobupivacaine + dexamethasone group it was 4.07 ± 0.64 min, which was highly statistically significant.Similar observations were found in the studies conducted by Pani et al**.**[10]In their study comparing 0.5% levobupivacaine and 0.5% levobupivacaine with dexamethasone 8 mg combination in brachial plexus block by the supraclavicular approach observed thatthere was early onset of sensory and motor effect.

In a randomized, double blind study done by Ritu. B et al [12], theydemonstrated that the addition of dexamethasone to 0.5% isobaric levobupivacaine in supraclavicular brachial plexus block results in faster onset of sensory and motor blockade. Shrestha et al. [13], in their study performed a brachial plexus block with 40-50 ml of local anaesthetic with 1:200,000 adrenaline in one group and in the other group the block was performed with the same number of local anaesthetics with dexamethasone. The study confirmed that addition of dexamethasone leads to significantly faster onset of action of sensory and motor block similar to our study. However, in contrast to this study, we were able to use a smaller volume of local anaesthetic in our study using Ultrasound guidance.

Our study is also in agreement with the study done by Islam et al [14]with respect to faster onset of sensory block using dexamethasone as an adjuvant in peripheral nerve block. Direct comparisons are difficult with some studies because they have used different local anaesthetics with dexamethasone as an adjunct.

Onset of motor block in levobupivacaine group was 8.87+ 0.73 min whereas in levobupivacaine + dexamethasone, it was 5.97+ 0.67min, which was highly statistically significant ($P < 0.001$).Our study concurs with the study of conducted by Pani et al[10] ,who used the same concentration and volume of levobupivacaine and dexamethasone as in our study. A meta-analysis concluded that dexamethasone produced late onset of sensory and motor block with prolongation of motor block duration and that the smaller doses of dexamethasone (4-5mg) were as equally effective as higher doses of dexamethasone (8-10mg).[15]However, the meta-analysis did not analyse any study using dexamethasone (8mg) with levobupivacaine in supraclavicular brachial plexus block.A major limitation was that different local anaesthetics were used in combination with dexamethasone for brachial plexus block.

Our study agrees with the study done by Ritu B et al [55] with respect to faster onset of motor blockade, but in their study, they used landmark based technique for supraclavicular block, and it involves usage of 30ml of local anaesthetic in contrast to 25ml that we used in our study. They have used the same Lovett rating scale to measure onset of motor block. Our study concurs with the studies done by Shrestha et al [3] and Islam et al [57], in which dexamethasone was used as an adjuvant to local anaesthetics in peripheral nerve block, reduced the onset time for motor block.

Duration of sensory block in levobupivacaine group was 171.67 ± 13.54 min whereas in levobupivacaine + dexamethasone group it is 400.33 ± 23.34 min, which is highly significant ($P < 0.001$). Duration of motor block in levobupivacaine group was 153.83 ± 14.43 min whereas in levobupivacaine + dexamethasone group it is 322±29.47 min, which is highly

significant (P < 0.001). The studies done by Pani et al [10], Baloda et al [15], Shrestha et al [13], Biradar et al [4], Islam et al also showed that dexamethasone when used an adjuvant with local anaesthetic prolongs sensory and motor block in peripheral nerve blocks.

A meta-analysis done by Knezevic NN et al also showed that dexamethasone prolongs block duration but with no effect on the onset time [16], but in our study the onset time has shortened with the use of dexamethasone which could be due to use of 8mg of dexamethasone which was used instead of 4mg.

In our study, time to first rescue analgesia in Levobupivacaine group was 424.17 ± 36.08 min whereas in levobupivacaine + dexamethasone it is 676 ± 37.79min, which is statistically highly significant (P<0.001). It is defined as the time from onset of block to the administration of first rescue analgesic. As far as time to first rescue analgesia wasconcerned, our study is in complete agreement with studies done by Pani et al [10], Baloda et al.[15]

Biradar et al.,[4] conducted a prospective randomized, double blind study to evaluate the effect of dexamethasone added to lidocaine in supraclavicular brachial plexus block. The duration of sensory and motor blockade was significantly longer and duration of and thus duration of analgesia was also more in the dexamethasone group than in the control group (p=0.001)

Shrestha et al.,[13] confirmed that addition of dexamethasone leads to significantly faster onset of action and prolonged duration of analgesia for brachial plexus block.

In the study done by Baloda et al [15], the time to first analgesic use and total need for analgesics were recorded during the first postoperative 12 hours whereas in our study we recorded it for 24 hours. Pain was evaluated using the visual analog scale (VAS) where zero (0) represented no pain and 10 meant the worst possible pain. If VAS values were > 4, it was considered that analgesic action of the drugs is terminated and rescue analgesic (IM Diclofenac 1-1.5mg/kg) was given.

In contrast to that post-operative analgesia was monitored as per a numeric rating scale of 0–10 at every hour up to 24 hours in our study.It was considered that analgesic action of the block had terminated when the pain was more than 5 on the scale and patient was given 100mg Tramadol injection intravenously as a rescue analgesic.

In our study we observed that adding dexamethasone (8 mg) to levobupivacaine not only delayed the time for the first rescue analgesic but also reduced the number of total rescue analgesics in first 24 hours. In Group S, 14 patients (47%) required 3 doses of rescue analgesics and 16 patients (53%) required 2 doses of tramadol as rescue analgesic. Whereas in Group D, 8 patients (27%) required 3 doses, 10 patients (33%) required 2 doses and 12 patients (40%) required only one dose of rescue analgesic. There is a significant difference between the two groups (p value 0.001). Thus, addition of dexamethasone decreases postoperative total analgesic use. Similar results were also shown by Persec et al. [17], Shrestha et al. [13], Islam et al.[14] and by many other authors.

Table-6: Time to first rescue analgesic

	Non-trial arm		**Trial arm**		
	Mean	**SD**	**Mean**	**SD**	**p-value**
Time to request for first rescue analgesia	424.17	+ 36.08	676	+ 37.79	< 0.001

Persec et al. [18] concluded that using single-shot low-dose dexamethasone in a mixture with levobupivacaine results in prolonged analgesia duration and less analgesic use compared with levobupivacaine alone.

In the present study, on comparison of heart rates, systolic and diastolic blood pressure in both groups at different time intervals, no statistically significant difference was observed. None of the patients had adverse effects like bradycardia or tachycardia, hypertension or hypotension following administration of dexamethasone along with local anaesthetic agent.Our findings corroborated with that of Pani et al [10],Choi et al. [17], Persec et al [18]., and Shrestha et al.[13], who also found no significant difference in haemodynamic parameters on addition of dexamethasone to LA.
The incidence of adverse events in either group was nil. As care was taken not to exceed safety margin of levobupivacaine which was 3mg/kg body weight and systemic toxicity from a single dose of 8mg dexamethasone is unlikely.

CONCLUSION

From our study we conclude that addition of Dexamethasone to 0.5% Levobupivacaine for supraclavicular brachial plexus block decreases the onset of block and increases duration of sensory block, motor block as well as duration of analgesia.

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