Effect of Adding Dexamethasone to Bupivacaine in Ultrasound Guided Supraclavicular Brachial Plexus Block Versus Bupivacaine alone for Upper Limb Orthopedic Surgery; A Comparative Study

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ABSTRACT

Background: Brachial plexus blocks are among the most commonly performed peripheral nerve blocks for upper extremity surgeries in clinical practice. Local anesthetics alone for supraclavicular brachial plexus block provide good operative conditions but have shorter duration of postoperative analgesia. Several adjuvants added to local anaesthetics in brachial plexus block are used to achieve quick, dense, and prolonged block. Dexamethasone has been shown to prolong peripheral nerve blockade in animals and, when added to bupivacaine, to extend the duration of analgesia in humans.

Objective: The aim of the current study was to evaluate the effects of adding dexamethasone (8 mg) to 28 ml of bupivacaine 0.5% in ultrasound-guided supraclavicular brachial plexus block for upper limb orthopaedic surgery versus bupivacaine 0.5% alone.

Patients and Methods: The study included patients scheduled for elective upper limb orthopaedic surgery. A randomized double-blinded controlled study is the design used in this study. It was carried on 40 patients who were divided into two groups; 20 patients of each: group B (control group): patients received 28 ml of bupivacaine 0.5% + 2 ml of normal saline and group D (study group): patients received 28 ml of bupivacaine 0.5% + 8 mg of dexamethasone (2 ml).

Results: There was significant difference between both groups as regards the onset of sensory and motor block, group D has faster onset sensory block (10.30 ± 2.27 versus 12.85 ± 2.5 minutes, as well as motor block (15.15 ± 2.37 versus 18.25 ± 2.22 minutes). The duration of sensory block was significantly prolonged in group D than in group B (18.45 ± 2.26 versus 10.33 ± 1.54 hours) as well as the duration of motor block (14.18 ± 2.24 versus 8.34 ± 1.50 hours). There was significant prolongation of the duration of postoperative analgesia and less doses of postoperative rescue analgesic in group D.

Conclusion: We concluded that addition of 8 mg of dexamethasone to bupivacaine 0.5% in ultrasound guided supraclavicular brachial plexus block shortened the onset times of both sensory and motor blocks, significantly prolonged their durations, and prolonged the analgesia of brachial plexus block with subsequent consumption of less amount of postoperative analgesics in comparison to bupivacaine 0.5% alone.

Keywords: ultrasound, bupivacaine, brachial plexus, dexamethasone.

INTRODUCTION

Brachial plexus blocks are among the most commonly performed peripheral nerve blocks for upper extremity surgeries in clinical practice. It offers many advantages over general anaesthesia for upper limb surgeries such as sympathetic block, better postoperative analgesia, high success rate and fewer side effects [(1)]. Various approaches to the brachial plexus have been described but the supraclavicular approach is the easiest and most consistent method for anaesthesia and perioperative pain management in surgery below the shoulder joint. Local anaesthetics alone for supraclavicular brachial plexus block provide good operative conditions but have shorter duration of postoperative analgesia. This problem can be overcome by using long acting local anaesthetics like bupivacaine or by using adjuvant in regional anaesthesia. Adjuvant added to brachial plexus block should prolong the analgesia, without having systemic side effects, prolong motor block and should also reduce the total dose of local anaesthetic. Various studies have investigated several adjuvants including opioids, clonidine, neostigmine, bicarbonate added to local anaesthetics in brachial plexus block to achieve quick, dense, and prolonged block, but the results are either inconclusive or associated with side effects [(2)].

Dexamethasone, a high-potency, long-acting glucocorticoid, has been shown to prolong peripheral nerve blockade in animals and, when added to bupivacaine, to extend the duration of analgesia in humans. Although incompletely understood, dexamethasone's mechanism of action may stem from decreased nociceptive C-fiber activity via a direct effect on glucocorticoid receptors and inhibitory potassium channels. Other suggested mechanisms include a local vasoconstrictive effect, resulting in reduced local anaesthetic absorption, or a

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systemic anti-inflammatory effect following vascular uptake of the drug [3]

The aim of the current study was to evaluate the effects of adding dexamethasone (8 mg) to 28 ml of bupivacaine 0.5% in ultrasound guided supraclavicular brachial plexus block for upper limb orthopaedic surgery versus bupivacaine 0.5% alone.

PATIENTS AND METHODS

This randomized double-blinded controlled study included a total of 40 patients who scheduled for elective upper limb orthopedic surgery, attending at Ahmed Maher Teaching Hospital in cooperation with Ain Shams University Hospitals. Approval of the ethical committee in Ahmed Maher Teaching Hospital and a written informed consent from all the subjects were obtained. This study was conducted between July 2017, and February 2018.

Patients were divided into two groups; 20 patients each:

- Group B (control group) (n=20): patients received 28 ml of bupivacaine 0.5% + 2 ml of normal saline.
- Group D (study group) (n=20): patients received 28 ml of bupivacaine 0.5% + 8 mg of dexamethasone (2 ml).

Inclusion criteria:

1. American Society of Anaesthesiologists (ASA) physical status classification class I or II, age group 18-60 years of both sexes, patients undergoing elective upper limb orthopaedic surgery.

Exclusion criteria

Patient refusal (consent not given), ASA physical status classification class III or more, Any bleeding disorder and patient on anticoagulants, severe respiratory disease, Neurological deficit involving brachial plexus, Local infection at the injection site, History of allergy to local anaesthetic, Patients with a history of peptic ulcer disease, diabetes mellitus, hepatic or renal failure, Pregnant women.

RESULTS

1- Demographic data

There was no statistically significant difference between the two groups as regards age, height, weight, gender, ASA physical status and duration of surgery.

Table (1): Comparison between group B and group D as regards the demographic data, ASA physical status classification and duration of surgery, expressed as mean, ±SD

		Group B	Group D	P-value	Sig.
		No. = 20	No. = 20		
Age (years)	Mean±SD	33.80 ± 9.92	34.75 ± 7.52	0.735	NS
	Range	18 – 52	22 – 55		
Weight (kg)	Mean±SD	67.85 ± 8.06	71.35 ± 5.45	0.116	NS
	Range	55 – 85	60 – 82		
Height (cm)	Mean±SD	165.95 ± 6.58	168.70 ± 6.92	0.206	NS
	Range	155 – 180	158 – 180		
Gender	Female	6 (30.0%)	5 (25.0%)	0.723	NS
	Male	14 (70.0%)	15 (75.0%)		
ASA	1	17 (85.0%)	18 (90.0%)	1.000	NS
	2	3 (15.0%)	2 (10.0%)		
Duration of surgery (min)	Mean±SD	86.00 ± 8.21	85.50 ± 8.57	0.852	NS
	Range	70 – 100	70 – 100		

2- Onset and duration of sensory and motor block:

There was significant difference between both groups as regards the onset of sensory and motor block, group D has faster onset sensory block (10.30 ± 2.27 versus 12.85 ± 2.5 minutes, $P < 0.05$) as well as motor block (15.15 ± 2.37 versus 18.25 ± 2.22 minutes, $P < 0.05$). The duration of sensory block was significantly prolonged in group D than in group B (18.45 ± 2.26 versus 10.33 ± 1.54 hours, $P < 0.05$) as well as the duration of motor block (14.18 ± 2.24 versus 8.34 ± 1.50 hours, $P < 0.05$).

Table (2): The onset and duration of sensory and motor block in group B and group D

		Group B	Group D	P-value	Sig.
		No. = 20	No. = 20		
Onset of sensory block (min)	Mean±SD	12.85 ± 2.50	10.30 ± 2.27	0.002	S
	Range	10 – 18	7 – 14		
Onset of motor block (min)	Mean±SD	18.25 ± 2.22	15.15 ± 2.37	0.001	S
	Range	15 – 23	11 – 19		
Duration of sensory block (hours)	Mean±SD	10.33 ± 1.54	18.45 ± 2.26	0.001	S
	Range	8 – 13	15 – 23		
Duration of motor block (hours)	Mean±SD	8.34 ± 1.50	14.18 ± 2.24	0.001	S
	Range	5.5 – 11	11 – 18		

NS: Non significant; S: Significant

3 - Pain assessment using VAS:

As regards the postoperative visual analogue scale, there was statistically significant difference between the two groups at 6th hour, 7th hour, 8th hour, 14th hour and 24th hour. Postoperative VAS was significantly lower in Group D as shown in table 3.

Table (3): Group B and group D compared as regards postoperative visual analogue scale

VAS score	Group B	Group D	P-value	Sig.
	Median (IQR)	Median (IQR)		
1st hour	0 (0 – 0)	0 (0 – 0)	1.000	NS
2nd hour	0 (0 – 0)	0 (0 – 0)	1.000	NS
3rd hour	0 (0 – 0)	0 (0 – 0)	1.000	NS
4th hour	0 (0 – 0)	0 (0 – 0)	1.000	NS
5th hour	0 (0 – 0)	0 (0 – 0)	0.152	NS
6th hour	0 (0 – 1)	0 (0 – 0)	0.001	S
7th hour	2 (0 – 3)	0 (0 – 0)	0.001	S
8th hour	3 (1 – 4)	0 (0 – 0)	0.001	S
14th hour	3 (3 – 4)	1 (0 – 3)	0.001	S
20th hour	4 (3 – 5)	3 (3 – 4)	0.193	NS
24th hour	4 (4 – 4)	3 (2 – 3)	0.001	S

NS: Non significant; S: Significant

4 - Timing and total amount of rescue analgesia:

As regards timing of postoperative rescue analgesia and total postoperative analgesic consumption, there was significant prolongation of the duration of postoperative analgesia and less doses of postoperative rescue analgesic in group D as shown in table 4. Total amount of postoperative analgesia was significantly less in group D (43.50 ± 15.31 mg) as compared to group B (81.00 ± 14.10 mg).

Table (4): Comparison between group B and group D as regards the timing of analgesia, number and total amount of postoperative rescue analgesics in 24 hours

		Group B	Group D	P-value	Sig.
		No. = 20	No. = 20		
Timing of Analgesia (hour)	Mean±SD	10.33 ± 1.54	18.45 ± 2.26	0.001	S
	Range	8 – 13	15 – 23		
Number of Rescue Analgesia	Mean±SD	2.70 ± 0.47	1.45 ± 0.51	0.001	S
	Range	2 – 3	1 – 2		
Total amount of analgesia (mg)	Mean±SD	81.00 ± 14.10	43.50 ± 15.31	0.001	S
	Range	60 – 90	30 – 60		

NS: Non significant; S: Significant

5 – Intraoperative haemodynamic variables:

As regards intraoperative heart rate, there was no statistically significant difference between the two groups as shown in table 5.

Table (5): Intraoperative heart rate in group B and group D

Intraoperative HR		Group B	Group D	P-value	Sig.
		No. = 20	No. = 20		
5 min	Mean±SD	76.25 ± 4.08	76.35 ± 5.23	0.947	NS
	Range	67 – 82	68 – 84		
10 min	Mean±SD	76.75 ± 4.53	75.80 ± 4.00	0.486	NS
	Range	68 – 83	69 – 82		
15 min	Mean±SD	76.15 ± 4.20	75.40 ± 4.20	0.575	NS
	Range	68 – 84	66 – 84		
20 min	Mean±SD	75.95 ± 2.26	75.65 ± 3.79	0.763	NS
	Range	70 – 80	68 – 82		
25 min	Mean±SD	76.50 ± 2.12	76.25 ± 3.89	0.802	NS
	Range	72 – 79	67 – 82		
30 min	Mean±SD	76.45 ± 3.27	75.30 ± 3.21	0.269	NS
	Range	69 – 82	68 – 80		
60 min	Mean±SD	76.40 ± 3.84	74.60 ± 4.04	0.157	NS
	Range	67 – 82	68 – 82		
90 min	Mean±SD	75.90 ± 3.01	75.65 ± 3.59	0.813	NS
	Range	70 – 80	69 – 82		

NS: Non significant; S: Significant

As regards intraoperative MABP, there was no statistically significant difference between the two groups as shown in table 6.

Table (6): Intraoperative mean arterial blood pressure (MABP)

Intraoperative MABP		Group B	Group D	P-value	Sig.
		No. = 20	No. = 20		
5 min	Mean±SD	89.50 ± 3.52	89.85 ± 3.87	0.766	NS
	Range	83 – 98	80 – 98		
10 min	Mean±SD	88.55 ± 3.76	90.50 ± 3.51	0.098	NS
	Range	83 – 97	85 – 100		
15 min	Mean±SD	89.65 ± 3.57	89.30 ± 4.11	0.775	NS
	Range	85 – 97	83 – 98		
20 min	Mean±SD	87.80 ± 4.46	89.30 ± 4.41	0.292	NS
	Range	81 – 97	82 – 97		
25 min	Mean±SD	88.55 ± 4.31	90.95 ± 3.68	0.066	NS
	Range	80 – 94	86 – 97		
30 min	Mean±SD	87.75 ± 3.67	90.20 ± 5.20	0.093	NS
	Range	82 – 95	81 – 99		
60 min	Mean±SD	91.00 ± 4.46	90.65 ± 4.00	0.795	NS
	Range	81 – 99	84 – 99		
90 min	Mean±SD	88.85 ± 3.33	88.15 ± 4.12	0.558	NS
	Range	83 – 96	81 – 96		

NS: Non significant; S: Significant

6 – Postoperative haemodynamic variables:

As regards postoperative heart rate, there was no statistically significant difference between the two groups.

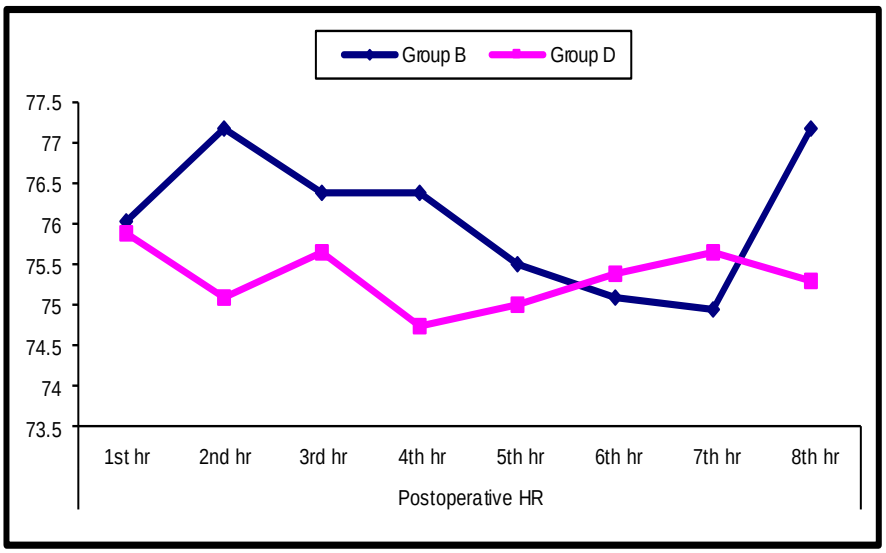

Figure (1): Postoperative HR at different time intervals.

As regards the postoperative mean arterial blood pressure, there was no statistically significant difference between the two groups.

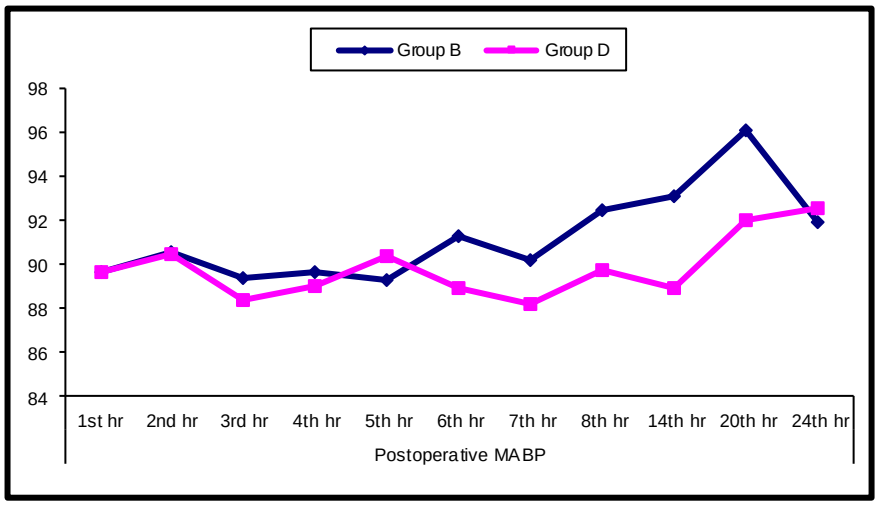

Figure (2): Postoperative MABP at different time intervals.

7- Complications

As regards the complications (e.g., pneumothorax, Horner's syndrome or LAST), none of the patients in both groups had experienced any side effect or complication either of the anaesthetic technique or of the used drugs. There were two cases of failed block in group B and one case in group D and those subjects were supplemented with general anaesthesia and excluded from the study.

Table (7): Complications in group B and group D

	Group B No. = 20	Group D No. = 20	P-value	Sig.
Complications (Y/N	N	N	1.000	NS

NS: Non significant; S: Significant

DISCUSSION

Supraclavicular brachial plexus block is a popular and widely employed regional nerve block technique for perioperative anaesthesia and analgesia for surgery of the upper extremity. Local anaesthetics alone for supraclavicular brachial plexus block provide good operative conditions but have shorter duration of postoperative analgesia [4]. Different drugs have been used as adjuvant with local anaesthetics in brachial plexus block to achieve quick, dense and prolonged block. Drugs like clonidine, dexmedetomidine, buprenorphine and

dexamethasone are being used along with local anaesthetics for this purpose [5].

In the current study, 40 patients scheduled for elective upper limb orthopaedic surgery were given US guided supraclavicular brachial plexus block. The patients were randomly allocated into two groups. The group B (control group) received 0.5% bupivacaine (28 ml) plus normal saline (2 ml). The group D (study group) received 0.5% bupivacaine (28 ml) plus dexamethasone 8 mg (2 ml). All patients received equal volumes of 30 ml.

The two groups were compared as regards their demographic data (age, sex, height and body weight), ASA physical status classification, the duration of surgery, onset and duration of sensory block and onset and duration of motor block. Assessment postoperative pain was done using visual analogue scale. Intraoperative as well as postoperative haemodynamics were measured and compared. Observation of the possible complications of either the anaesthetic procedure or the study drugs was done. Data were collected for each patient and statistical analysis and comparison between the two groups were done.

Concerning the demographic data there was no statistically significant variation between the study groups. As regards the duration of surgery, the time recorded for each patient showed statistically non-significant differences between the study groups.

The major findings of this study indicated that the onset of sensory and motor block were significantly faster in Group D in comparison with Group B. Duration of sensory and motor block showed significant increase in Group D as compared to Group B. Total postoperative analgesic consumption was significantly less in group D than in in group B.

However, direct comparisons to other studies are difficult because of the variety of local anaesthetic mixtures used, different blocks studied and different methods of evaluating block duration.

The effect of prolongation of the block is thought to be mediated by attenuating the release of inflammatory mediators, reducing ectopic neuronal discharge and inhibiting potassium channel mediated discharge of nociceptive C fibers [6]. In the current study, when group D (dexamethasone group) was compared to group B (control group), it was found that addition of dexamethasone to bupivacaine significantly prolonged the duration of sensory block (18.45 ± 2.26 versus 10.33 ± 1.54 hours). Similarly, the duration of motor block was significantly prolonged in group D (14.18 ± 2.26 hours) versus (8.34 ± 1.50 hours) in group B.

Another study done by ***Parveen and his colleagues*** [7] showed significant prolongation of sensory and motor block of US guided supraclavicular brachial plexus block by adding 8 mg (2 ml) of dexamethasone to 30 ml of 0.5% bupivacaine (group II). The study was done on 60 patients undergoing upper limb surgery divided into two equal groups. The control group (group I) received 2 ml of normal saline instead of dexamethasone. The duration of sensory block was 1085.73 ± 234.23 minutes in group II while it was 322.37 ± 138.37 minutes in group I. The duration of motor block was 1085.73 ± 234.23 minutes in group II while it was 322.37 ± 138.37 minutes in group I.

Similar results were reported by ***Baloda and his colleagues*** [8] where they added the same dose (8 mg) of dexamethasone to 30 ml of 0.5% levobupivacaine (group 2) used in supraclavicular brachial plexus block using landmark paraesthesia technique. This was done in 60 patients scheduled to undergo elbow, forearm and hand surgery who were divided into two equal groups. The control group (group 1) received 30 ml of 0.5% levobupivacaine with 2 ml of normal saline. The mean duration of sensory block was 657.2 minutes in group 1 and 923 minutes in group 2 while the mean duration of motor block was 540 minutes in Group 1 and 798.83 minutes in Group 2.

Persec et al. [9], concluded that using low-dose dexamethasone in a mixture with levobupivacaine results in prolonged duration of both sensory and motor block. The study was done on 70 patients undergoing upper extremity surgery divided into two groups. Group 1 (35 patients) received 25 ml 0.5% levobupivacaine plus 4 mg of dexamethasone. While group 2 (25 patients) received 25 ml of 0.5 % levobupivacaine plus 1 ml of normal saline. Duration of sensory block was 1260 minutes in group 1 versus 600 minutes in group 2 and duration motor block was 1200 minutes in group 1 versus 700 minutes in group 2.

However, ***Abdallah and his colleagues*** [10] concluded that the effectiveness of IV dexamethasone in prolonging the duration of sensory block seems similar to perineural dexamethasone and they recommended the use of IV dexamethasone over perineural dexamethasone. Their study was performed on 75 patients scheduled for unilateral upper extremity surgery under US guided supraclavicular brachial plexus block divided into 3 equal groups. The control group received 30 ml of

0.5% bupivacaine plus 2 ml of normal saline perineural and 100 ml of normal saline IV. The mean duration of sensory block was 13.2 hours in this group. The perineural dexamethasone group received 30 ml of 0.5% bupivacaine plus 8 mg (2 ml) of dexamethasone perineural and 100 ml of normal saline IV. The IV dexamethasone group received the same perineural combination as in the control group but with 98 ml of normal saline and 8 mg (2 ml) of dexamethasone IV. The mean duration of sensory block was 25 hours (19.5–27.4) in the perineural dexamethasone group and 25 hours (17.6–23.6) in the IV dexamethasone group.

The cause of differences between the duration of blocks may be attributed to the type of patients and dose of injected drugs in the block.

Also, in the current study, it was noticeable that dexamethasone group showed faster onset of sensory block when compared to the control group (10.3 ± 2.27 versus 12.85 ± 2.5 minutes). Also the onset of motor block was faster in group D than in group B (15.15 ± 2.37 versus 18.25 ± 2.22 minutes).

Similar results were found by ***Alarasan and his colleagues*** [(11)] who added 8 mg of dexamethasone to 20 ml of 0.5% bupivacaine (group D) in supraclavicular brachial plexus block using US. The study was done on 60 patients undergoing upper limb orthopaedic surgeries for fractures around the elbow, forearm, and hand. They were randomly divided into two equal groups. The control group (group C) received 20 ml of 0.5% bupivacaine plus 2 ml of normal saline. The onset of sensory block was 10.36 ± 1.99 minutes in group D while it was 12.9 ± 2.23 minutes in group C. The onset of motor block in group C and D were 18.03 ± 2.41 minutes and 12 ± 1.64 minutes respectively.

Another study done by ***Pani and his colleagues*** [(12)] showed similar results when they added 2 ml of dexamethasone (8 mg) with 25 ml of 0.5% levobupivacaine (group D) in US guided supraclavicular brachial plexus block. The block was given to 60 patients posted for upper limb surgery, randomly assigned into two equal groups. The control group (group S) received 2 ml of normal saline with 25 ml of 0.5% levobupivacaine. Sensory block onset in group S was 7.20 ± 1.73 minutes while it was 4.30 ± 1.32 minutes in group D. The onset of motor block was 9.03 ± 1.73 minutes in group S while it was 6.03 ± 0.96 minutes in group D.

Our results are in accordance with work of ***Engineer and his colleagues***[(13)] which included 100 patients undergoing upper limb surgery using supraclavicular brachial plexus block by landmark technique. Group C (50 patients) received 30 ml of 0.375% bupivacaine with 2 ml of normal saline, while group D (50 patients) received 30 ml of 0.375% bupivacaine with 2 ml (8 mg) of dexamethasone. Sensory block onset time was 7.12 ± 1.73 minutes in group D while it was 14.32 ± 1.71 minutes in group C. Onset of motor block was 11.46 ± 2.39 minutes in group D while it was 18.64 ± 1.69 minutes in group C.

In contrast to the current study, ***Arish and his colleagues*** [(14)] found no statistically significant difference in the onset of sensory and motor block. The study included 50 patients who were planned to undergo below shoulder upper limb surgeries (both elective and emergency) under supraclavicular brachial plexus block using nerve stimulator. Group D (25 patients) received 38 ml of 0.25% bupivacaine plus 8 mg of dexamethasone (2 ml). Group S (25 patients) received 38 ml of 0.25% bupivacaine plus 2 ml of normal saline. Onset of sensory block was 28 ± 4.082 minutes and 28.8 ± 3.317 minutes in group D and group S respectively. Onset of motor block was 38.8 ± 3.317 minutes and 38.69 ± 3.317 minutes in group D and group S respectively. The delay in onset may be caused by reduced concentration of bupivacaine (0.25%) used in the study.

On the other hand, ***Shaikh and his colleagues*** [(4)] concluded that the addition of dexamethasone has no effect on the onset time of sensory and motor block. Their study included 60 patients posted for elective orthopaedic surgeries of elbow, forearm and hand under supraclavicular brachial plexus block using nerve stimulator. Group A (30 patients) received 38 ml of 0.25% bupivacaine and 2 ml of dexamethasone (8 mg). Group B (30 patients) received 38 ml of 0.25% bupivacaine and 2 ml of normal saline. The onset of sensory block was 18.26 ± 1.25 minutes in group A while in group B it was 18.70 ± 1.26 minutes. Onset of motor block was 19.96 ± 1.28 minutes in group A while it was 20.26 ± 1.28 minutes in group B.

As regards postoperative analgesia and the total postoperative analgesic consumption, the current study showed that in group D (dexamethasone group) compared to group B (control group), there was a significant prolongation of the duration of postoperative analgesia. Patients of group D showed remarkably lower VAS scores through the study period than group B (median was 3 at 14th hour while it was 1 for group D). Patients of group D needed less doses of postoperative

ketorolac (1.45 ± 0.51) as compared to group B (2.7 ± 0.47). Total amount of analgesia was less in group D (43.5 ± 15.31 mg) as compared to group B (81 ± 14.1 mg).

In another study done by ***El-Baradey and Elshmaa*** [15] similar results was obtained. They done their study on 60 patients divided into 3 equal groups. Patients were posted for elective surgery to upper limb under US guided supraclavicular brachial plexus block. Group E received 30 ml of 0.5% bupivacaine with 1: 200, 000 epinephrine (5 µg/mL). Group D received 30 ml of 0.5% bupivacaine and 8 mg of dexamethasone. Group M received 30 ml of 0.5% bupivacaine and midazolam 50 µg/kg. Postoperative rescue analgesic in form of paracetamol 30 mg/kg IV if VAS (4-6) or meperidine (30 mg) IV if VAS > 6 were used. Group D showed significant decrease in postoperative VAS pain scores at 12 and 24 hours postoperatively (0 and 2.14 ± 0.7) in comparison with group E (6.1 ± 1.2 and 5.8 ± 0.9) and group M (3.2 ± 0.8 and 4.14 ± 1.3).

Shaikh and his colleagues [4] found similar results to the current study. Rescue analgesic chosen was diclofenac sodium injection. In the control group, 24 patients received 2 diclofenac sodium injections and 3 patients received 3 injections in the first 24 hours postoperative period. While in the study group, 25 patients received analgesia once and 2 patients received 2 injections.

As regards haemodynamic data in the current study, blood pressure and heart rate were recorded intraoperative and postoperative. There was no statistically significant difference in haemodynamics between the two groups.

Similarly ***Parveen and his colleagues*** [7] found no statistically significant difference between the study and control groups as regards the haemodynamic variables (HR and blood pressure) both intraoperative and postoperative.

Concerning the complications in the current study, none of the patients in both groups had experienced any side effect or complication either of the anaesthetic technique or of the used drugs.

In contrast to the current study, ***Pathak and his colleague*** [5] reported one case of Horner's syndrome. The study included 50 patients divided into 2 equal groups posted for upper extremity surgeries below the shoulder joint under supraclavicular brachial plexus block using nerve stimulator. The study group received 1.5% adrenalized lidocaine (20 ml) and 0.5% bupivacaine (16 ml) plus dexamethasone 8 mg (2 ml) while the control group received 1.5% adrenalized lidocaine (20 ml) and 0.5% bupivacaine (16 ml) plus normal saline (2 ml).

CONCLUSION

It could be concluded that the addition of 8 mg of dexamethasone to bupivacaine 0.5% in ultrasound guided supraclavicular brachial plexus block shortened the onset times of both sensory and motor blocks, significantly prolonged their durations and prolonged the analgesia of brachial plexus block with subsequent consumption of less amount of postoperative analgesics in comparison to bupivacaine 0.5% alone.

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