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A Single Blind Randomised Comparative Study of the Effects of Clonidine and Dexamethasone as Adjuvant with Bupivacaine in Supraclavicular Approach of Brachial Plexus Block.

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Abstract: *The aim of the study is to compare the block characteristic and analgesic duration of equal volume of bupivacaine with either Dexamethasone or Clonidine for brachial plexus block by supraclavicular approach in upper limb surgery.*

Materials And Methods- *After obtaining the institutional ethical approval total 72 patients scheduled for elective upper limb surgery were divided into two groups.Group BD(36) patients received 0.5% Bupivacaine(30 ml) and 8mg(2ml) of Dexamethasone and Group BC (36) patients received 0.5%Bupivacaine(30 ml)with 1 ml Clonidine and 1 ml normal saline.The adequacy of block was evaluated and the patients of two groups were observrd for onset and duration of both motor and sensory block and also duration of analgesia in postoperative period.Incidence of peri and post operative complication in 2 different groups of patients were recorded.*

Statistical Analysis—*The results of observation were tabulated complied and statistically analyzed using SPSS 24 and GraphPad Prism Version 5.Once a t value is determined, p value can be found using table of values from Students's t distribution.If the calculated p value is below the threshold chosen for statistical significance then null hypothehis is rejected.p value <0.05 was considered for statistically significant.*

Result—*Dexamethasone and Clonidine both when added to bupivacaine in supraclavicular approach of brachial plexux block improved the quality of block.But Clonidine produced - better result when compared to Dexamethasone- the onset of both sensory and motor block was faster in Clonidine group and similarly the duration of motor and sensory block was significantly prolonged in Clonidine group.Occurrence of side effects during operation was observed in Clonidine group like bradycardia,but was manageable wheras Dexamethasone produce minimal side effect and is relatively safe.*

Key Words: *Brachial plexus block,Block quality,Clonidine,Dexamethasone,Bupivacaine.*

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I. Introduction

Peripheral nerve block have assumed a promonent role in modern anaesthesia practice as they provide ideal anaesthetic condition without any sdation or systemic haemodynamic effect[1] Brachial plexus block is commonly used regieonal anaesthetic technique for surgeries involving upper limb with advance in the field of surgery,surgical procedure have become more complex and operating time has increased manifold with a need to prolong the duration of brachial plexus block[2].Brachial plexus block provides a useful alternative to general anaesthesia for upper limb surgery.They achieve near ideal operatig condition by producing complete muscle relaxation, maintaining stable intra-operative haemodynamics and associated sympathetic block. The sympathetic block decreases post operative pain,vasospasm and oedema[3]

Supraclavicular brachial plexus block is the preferred regional anaesthetic technique for upper limb surgeries.In this approach brachial plexus is presented most compactly at the proximal division or at the trunk level that provides most reliable anaesthesia in upper limb surgery by anaesthetising the middle and lower plexus over 80% of the time(median, radial, ulnar)

There has always been a search for adjuvant to local anaesthetic for peripheral nerve block that prolong the duration of analgesia with minimum side effects.Increasing the volume of local anaesthetic may prolong the duration of analgesia, but may also increase the risk of local anaesthetic systemic toxicity.Although continuous catheter based nerve block can extend post-operative analgesia,their placement require additional time,cost and skill.

The concurrent injection of alpha-2 adrenergic agonist drug has been suggested to improve the nerve block characteristic of a local anaesthetic solution through either local vasoconstriction and facilitation of C fibre blockade[4] or simple diffusion along nerve.

Clonidine is a selective alpha-2 adrenargic agonist with some alpha -1 adrenergic activity.The addition of Clonidine to local anaesthetic solution improved the peripheral nerve block by reducing the onset time,improving the efficacy of block during surgery and extending postoperative analgesia[5,6] The effect off Clonidine is dose related between 0.1 and 0.5 microgm/kg [6]

Steroid have powerful anti-inflammatory as well as analgesic property.Perineural injection of steroid is found to influence postoperative analgesia[7]. .With this background this study is carried out to evaluate the efficacy of dexamethasone as adjuvant to bupivacaine in supraclavicular brachial block.Dexamethasone is highly potent and very selective glucocorticoid.Various studies have been done using dexamethasone 8mg as an adjuvant to local anesthetic mixture in brachialplexus block resulting rapid oset and prolonged duration of analgesia [8,9,10 ,11] and motor block[10,11]

In this context, the present study has undertaken to evaluate the effect of dexamethasone and clonidine as adjuvant to isobaric bupivacaine(0.5%) in supraclavicular brachial plexus block, on the onset time and duration of sensory as well as motor block and post operative analgesia.

II. Materials And Methods

Consenting 76 patients of either sex,aged between 18 and 60 years of ASA physical status I and II, scheduled for elective forearm surgery were selected for the study.Unwilling patient, patient incapable of giving consent due to physical or mental illness, patients having allergy to any study drug,patients with local infection or bleeding disorder,with history of drug or alchol abuse,with previous neurovascular deficit,with history of severe systemic disorder like hypertension,musculoskeletal disorder,body mass index >30kg/m^2 were excluded from the study.

After obtaining the approval from the ethical committee informed consent was obtained from all the patients.Patients were randomly allocated into one of the study groups:-based on computer generated systemic random sampling and sealed envelope technique.A formal written consent was taken from the patients.Patients were unaware of the adjuvant added to equal dose of bupivacaine.All patients received tab diazepam 5mg at night before surgery,they were also given tab ranitidine150 mg on previous night of surgery and another at 6 A.M in the morning on the day of surgery.In the operating room NIBP, ECG, and pulse oximetry were attached and base line heart rate, blood pressure and oxygen saturation were recorded.An intravenous line was secured on the unaffected limb and Ringer lactate was started intravenously.

All the patients were explained about the procedure. The patient was placed in supine position with the head turned away from the side to be blocked.The upper limb to be anaesthetised was adducted and hand is extended along the side.Antiseptic dressing and draping of the site was done.

Nerve stimulator was switched on.Using classic technique approach ,the midpoint of the clavicle was identified and marked.The posterior border of the sternocleidomastoid muscle was palpated easily when the patient raised the head slightly.Palpating the belly of anterior sclalene muscle moving towards interscalene groove with finger, a mark was made at approximately 1 .5 to 2cm posterior to the midpoint of clavicle.By palpating the subclavian artery at this site, the landmark was confirmed.The injection site was infiltrated with 1ml lignocaine 2% subcutaneously.Nerve stimulator was used to locate the brachial plexus.The stimulation frequency was set at 1HZ and the intensity of current was initially set at 1mA.It was then gradually decreased and location end point was distal motor response with an output <o.5mA,in the median nerve region.Correct neddle placement within fascia was confirmed by distal of the hand or wrist flexion or extension. elbow flexion or finger twitch. During injection negative aspiration was performed in every 5-6 ml to avoid intravascular injection.

Sensory and motor block of the nerve were determined at frequent interval after completion of injection.Sensory block was considered only when there will be complete loss of sensation to pin-prick.

Sensory block was graded according to Hollmen Scale(HS)

HS score 1= normal sensation to pin-prick.

HS score 2= weaker sensation to pinprick as compared

HS siescore 3= pinprick recokgnized as touch with blunt object.

Assesment of motor block was coined out by the same observer at each minute till complete motor blockade after drug injection.Onset of motor block has been considered when there will be grade 1 motor

blockade. Peak motor block was determined according to modified Bromage scale for upper extrimities on a 3-point scale.
Motor block of [12] will be graded as
Grade 0:- normal motor function with flexion and extension of elbow, wrist,and fingers
Grade 1:- decreased motor strength with ability to move fingers only.
Grade 2:- complete motor block with inability to move fingers also.

The block was considered incomplete when any of the segments supplied by median nerve,ulnar,radial,and musculotaneous will not have analgesia even after 30 minutes of injection.When more than one nerve remains unaffected,it was considered as a failed blok.In this case,general anaesthesia was given to the patient. Patients were monitored for haemodynamic variables suh as heart rate, blood pressure and oxygen saturation every 10 minute after the block intraoperatively and every 60 minute postoperatively for the first 6 hours and then 3 hourly till 24 hours.

Patients were assessed for duration of analgesia as per visual analogue scale (VAS) at every 4 hour or 12 hour. The numeric rating was recorded every 240 minutes post operatively till the score is "4".The rescue analgesia was given in the form of injection Diclofenac(1.5mg/kg) intramuscularly.Injection Ranitidine(50mg) was also given.All the patients were also observed for any side effects like nausea,vomiting,dryness of mouth,bradycardia and complication like pneumothorax, haematoma, local anaesthetic toxicity and post block neuropathy in intra and post operative period.

The duration of sensory block is defined as the time interval between the end of local anaesthetic administration and complete resolution of anaesthesia of all nerves.The duration motor block was defined as the time interval between the end of local anaesthetic administration and complete recovery of motor function of hand and forearm.

During the procedure,the analgesia was considered satisfactory,if the patient does not complain of any pain or discomfort.Postoperative follow up was carried out. The duration of analgesia was noted according to every 4 hour visual analogue scale(VAS)[13] for pain in post operative period upto 12 hours and every 30 minute interval during operation. Duration of analgesia was measured from time 0(just after drug delivery) till to the time when VAS score >4

III. Result And Analysis

The result of observation thus obtained in each group of patients were tabulated,complied and statistically analyzed using SPSS 24.0 and Graphpad prisom version 5.Data had been summerized as mean and standard deviation for numerical variable and count and percentage for categorical variable.Two sample "t" test for a difference in mean involved independent sample or unpaired sample.Paired "t" test were form of blocking and had greater power than unpaired test.

Once "t" value is determined, a" p" value can be found using the table of values from students "t' distribution.If the calculated p value is below the threshold chosen for statistical significance the null hypothesis p value < 0.05 was considered for statistically significant.
Results of are study are tabulated below:

Table 1: Distribution of Mean Age in Two Groups

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Age	Group-BC	36	31.5000	9.9298	18.0000	58.0000	29.5000	0.6923
	Group-BD	36	32.4444	10.2356	18.0000	52.0000	31.0000	

In Group-BC the mean age (mean± SD) of patients was 31.5000 ± 9.9298 years with range 18.0000 - 58.0000 years and the median was 29.5000 years. In Group-BD the mean age (mean± SD) of patients was 32.4444 ± 10.2356 years with range 18.0000 - 52.0000 years and the median was 31.0000 years. Difference of mean age in two groups was not statistically significant (p=0.6923).

Figure 1: Distribution of Sex in Two Groups

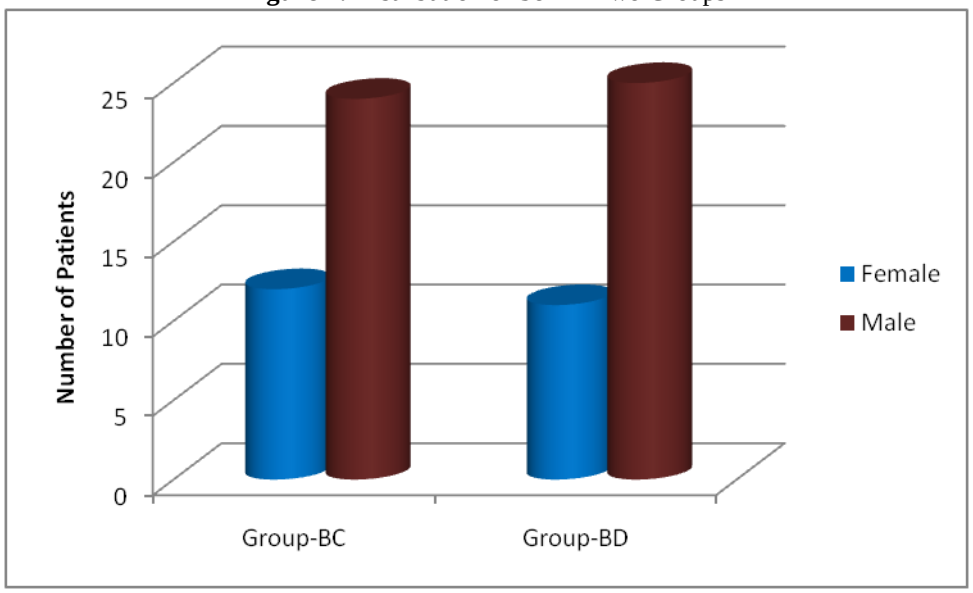


Table 2: Distribution of Mean Height (Cm) in Two Groups

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Height (Cm)	Group-BC	36	161.8056	5.6256	153.0000	172.0000	163.0000	0.7321
	Group-BD	36	162.2500	5.3419	150.0000	170.0000	164.0000	

In Group-BC the mean height (mean± SD) of patients was 161.8056 ± 5.6256 cm. In Group-BD the mean height (mean± SD) of patients was 162.2500 ± 5.3419 cm. Difference of mean height in two groups was not statistically significant (p=0.7321).

Table 3: Distribution of Mean Weight in Two Groups

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Weight	Group-BC	36	68.8056	2.8866	66.0000	78.0000	68.0000	0.3009
	Group-BD	36	69.5556	3.2111	66.0000	78.0000	69.0000	

In Group-BC the mean weight (mean± SD) of patients was 68.8056 ± 2.8866 kg. In Group-BD the mean weight (mean± SD) of patients was 69.5556 ± 3.2111 kg. Difference of mean weight in two groups was not statistically significant (p=0.3009).

Table 4: Distribution of Mean onset time of sensory block (min) in Two Groups

		Number	Mean	SD	Minimum	Maximum	Median	p-value
onset time of sensory block (min)	Group-BC	36	10.7500	1.2277	9.0000	12.0000	11.0000	<0.0001
	Group-BD	36	14.3333	1.1711	13.0000	17.0000	14.0000	

In Group-BC the mean onset time of sensory block (mean± SD) of patients was 10.7500 ± 1.2277 min. In Group-BD the mean onset time of sensory block (mean± SD) of patients was 9.0000 ± 1.1711 min. Difference of mean onset time of sensory block in two groups was statistically significant (p<0.0001).

Table 5: Distribution of Mean onset time of motor block (min) in Two Groups

		Number	Mean	SD	Minimum	Maximum	Median	p-value
onset time of motor block (min)	Group-BC	36	14.8611	1.3126	13.0000	17.0000	14.5000	<0.0001
	Group-BD	36	18.1389	1.5884	15.0000	21.0000	18.0000	

In Group-BC the mean onset time of motor block (mean± SD) of patients was 14.8611 ± 1.3126 min. In Group-BD the mean onset time of motor block (mean± SD) of patients was 18.1389 ± 1.5884 min. Difference of mean onset time of motor block in two groups was statistically significant (p<0.0001).

Table 6: Distribution of Mean duration of sensory block (min) in Two Groups

		Number	Mean	SD	Minimum	Maximum	Median	p-value

duration of sensory block (min)	Group-BC	36	646.8056	157.5489	440.0000	1270.0000	622.5000	<0.0001
	Group-BD	36	468.5000	47.8596	419.0000	602.0000	459.0000	

In Group-BC the mean duration of sensory block (mean± SD) of patients was 646.8056 ± 157.5489 min. In Group-BD the mean duration of sensory block (mean± SD) of patients was 468.5000 ± 47.8596 min. Difference of mean duration of sensory block in two groups was statistically significant (p<0.0001).

Table 7: Distribution of Mean duration of motor block (min) in Two Groups

		Number	Mean	SD	Minimum	Maximum	Median	p-value
duration of motor block (min)	Group-BC	36	577.3611	121.3995	400.0000	1040.0000	552.5000	<0.0001
	Group-BD	36	395.7500	21.0189	347.0000	422.0000	404.0000	

In Group-BC the mean duration of motor block (mean± SD) of patients was 577.3611 ± 121.3995 min. In Group-BD the mean duration of motor block (mean± SD) of patients was 395.7500 ± 21.0189 min. Difference of mean duration of motor block in two groups was statistically significant (p<0.0001).

Table 8: Distribution of Mean Time to first Diclofenac in first req in Two Groups

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Time to first Diclofenac in first req	Group-BC	36	14.2261	2.4024	10.0000	17.4000	14.7500	<0.0001
	Group-BD	36	9.2072	2.4293	5.6000	16.4000	8.9500	

In Group-BC the mean time to first Diclofenac in first req (mean± SD) of patients was 14.2261 ± 2.4024. In Group-BD the mean time to first Diclofenac in first req (mean± SD) of patients was 9.2072 ± 2.4293. Difference of mean time to first Diclofenac in first req in two groups was statistically significant (p<0.0001).

Table 9: Distribution of bradycardia in Two Groups

GROUP			
bradycardia	**Group-BC**	**Group-BD**	**TOTAL**
No	25	36	61
Row %	41.0	59.0	100.0
Col %	69.4	100.0	84.7
Yes	11	0	11
Row %	100.0	0.0	100.0
Col %	30.6	0.0	15.3
TOTAL	36	36	72
Row %	50.0	50.0	100.0
Col %	100.0	100.0	100.0

11 patients had bradycardia in group-BC and that was statistically significant.

Table 10: Distribution of VAS 4 hr in Two Groups

GROUP			
VAS 4 hr	**Group-BD**	**Group-BC**	**TOTAL**
0	23	34	57
Row %	40.4	59.6	100.0
Col %	63.9	94.4	79.2
1	13	2	15
Row %	86.7	13.3	100.0
Col %	36.1	5.6	20.8
TOTAL	36	36	72
Row %	50.0	50.0	100.0
Col %	100.0	100.0	100.0

Chi-square value: 10.1895**; p-value:** 0.0014

In Group-BD, 23(63.9%) patients had VAS 4 hr 0 and 13(36.1%) patients had VAS 4 hr 1. In Group-BC, 34(94.4%) patients had VAS 4 hr 0 and 2(5.6%) patients had VAS 4 hr 1. Association of VAS 4 hr in two groups was statistically significant (p=0.0014).

Fig 2:

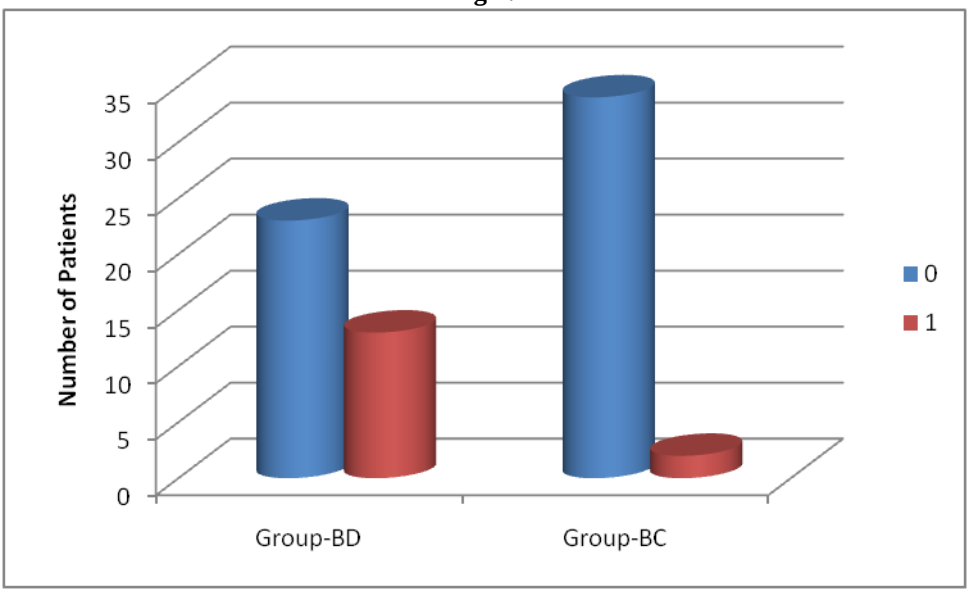


Table 11: Distribution of VAS 8 hr in Two Groups

GROUP			
VAS 8 hr	**Group-BD**	**Group-BC**	**TOTAL**
0 Row % Col %	20 41.7 55.6	28 58.3 77.8	48 100.0 66.7
1 Row % Col %	16 66.7 44.4	8 33.3 22.2	24 100.0 33.3
TOTAL Row % Col %	36 50.0 100.0	36 50.0 100.0	72 100.0 100.0

Chi-square value: 4.0000**; p-value:** 0.0455

In Group-BD, 20(55.6%) patients had VAS 8 hr 0 and 16(44.4%) patients had VAS 8 hr1. In Group-BC, 28(77.8%) patients had VAS 8 hr 0 and 8(22.2%) patients had VAS 8 hr 1. Association of VAS 8 hr in two groups was statistically significant (p=0.0455).

Fig 3: Distribution of VAS 8 hr in Two Groups

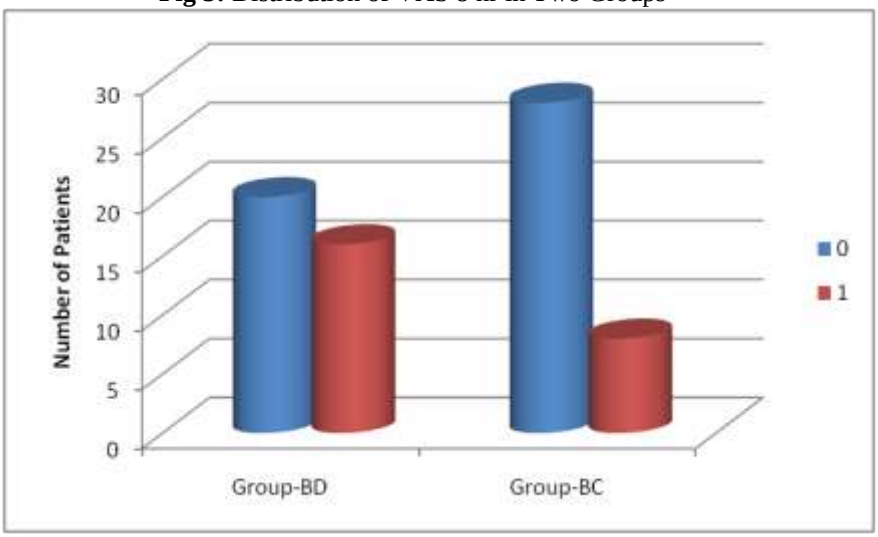


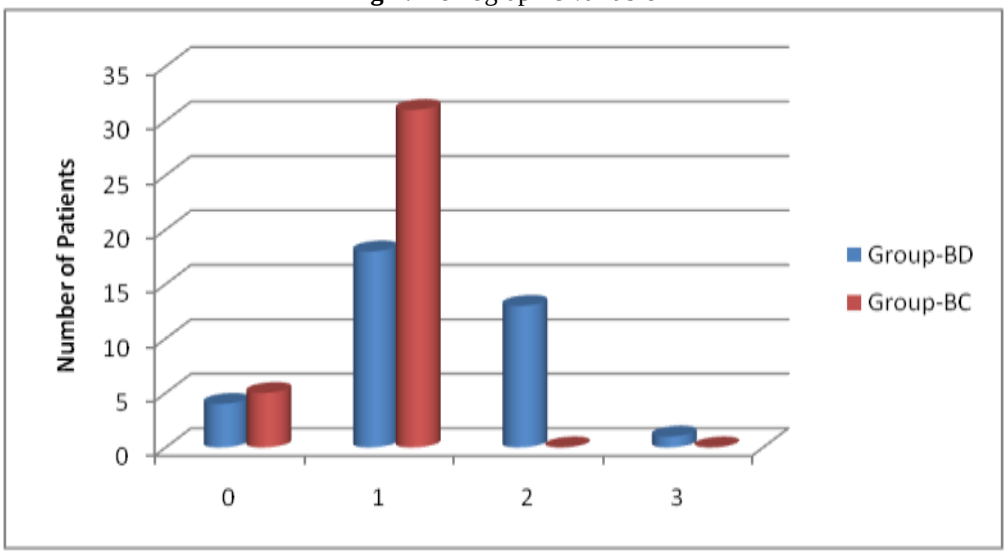
Table 12: Distribution of VAS 12 hr in Two Groups

GROUP			
VAS 12 hr	**Group-BD**	**Group-BC**	**TOTAL**
0	4	5	9
Row %	44.4	55.6	100.0
Col %	11.1	13.9	12.5
1	18	31	49
Row %	36.7	63.3	100.0
Col %	50.0	86.1	68.1
2	13	0	13
Row %	100.0	0.0	100.0
Col %	36.1	0.0	18.1
3	1	0	1
Row %	100.0	0.0	100.0
Col %	2.8	0.0	1.4
TOTAL	36	36	72
Row %	50.0	50.0	100.0
Col %	100.0	100.0	100.0

Chi-square value: 17.5601**; p-value:** 0.0005

In Group-BD, 4(11.1%) patients had VAS 12 hr 0, 18(50.0%) patients had VAS 12 hr 1, 13(36.1%) patients had VAS 12 hr 2 and 1(2.8%) patient had VAS 12 hr 3. In Group-BC, 5(13.9%) patients had VAS 12 hr 0 and 31(86.1%) patients had VAS 12 hr 1. Association of VAS 12 hr in two groups was statistically significant (p=0.0005).

Fig 4: Demographic variable



Demographic variable:--Both the groups (BC and BD)were statistically comparable with respect to age (Table 1),sex (Table 2),height(Table 3),weight(Table 4).No significant difference were observed among two groups (p value>0.05)

IV. Discussion

Pain is inseparable companion of human life.Although considerable advances have been made in the management of perioperative pain,a significant proportion of patient still suffer from inadequate pain control.The unrelieved surgical pain has been incriminated for the development of chronic pain syndrome.

Surgical pain is universal phenomenon, affecting all the patients in perioperative period,causing several deleterious effects on the patient body and mind.

Brachial plexus block is an easy and relatively safe procedure for upper limb surgery,Bupivacaine produces 3-4 hours of block,which is sufficient for upper limb surgery but not enough duration for elective post operative analgesia.Addition of 8 mg of dexamethasone effectively and significantly prolongs the duration of

analgesia.The block prolonging effect of dexamethasone is due to its local action and not a systemic one.The effect is mediated by glucocorticoid receptor [14].

Addition of steroid to local anaesthetic effectively and significantly prolong the duration of analgesia as well as producing earlier onset of action.This effect is suspected to be mediated by their anti inflammatory or immunesuppressive effect. Adverse effect of single dose of dexamethasone are probably extremely rare and minor in nature.

When steroid alone is used in regional blocks, the blockade is not produced. Steroids might bring about this effect by altering the function of potassium channels in the excitable cells. Steroids produce analgesia by blocking transmission in nociceptive C-fibers and suppressing ectopic neuronal discharge[15].

Steroids causes a degree of local tissue vasoconstriction and provides a slower uptake of local anaesthetic . Dexamethasone exhibits a potent anti-inflammatory effect and inhibits the release of inflammatory mediators like interleukins and cytokines, it promotes the release of antiinflammatory mediators leading to decreased postoperative pain [16] .

In our randomised single blind study,we have evaluaeted the effect on onset and duration of sensory and motor block among 2 groups—Bupivacaine(0.5% 30 ml) with clonidine(150 mcg-1ml) and Bupivacaine (0.5%-30ml) with dexamethasone(8mg—2ml) in supraclavicular brachial plexus block.In each group volume was diluted upto 32 ml with normal saline.

We studied that onset time of both sensory and motor block was faster in group BC compared to group BD patient and duration of both motor and sensory block was prolonged in group BC patient compared to BD patient.

Choi S et al [17] found that Dexamethasone prolonged the analgesic duration for long-acting LA from 730 to 1306 min [mean difference 576 min, 95% confidence interval (CI) 522–631] and for intermediate from 168 to 343 min (mean 175, 95% CI 73–277). Motor block was prolonged from 664 to 1102 min (mean 438, 95% CI 89–787). The most recent trial demonstrated equivalent prolongation with perineural or systemic administration of dexamethasone compared with placebo.

Chatrath V et al[18] found that significant differences were observed in the time for onset of sensory block (5.80 ± 5.12 min in group R and 4.87 ± 1.46 min in group B, $P < 0.05$); onset of motor block (11.37 ± 2.66 min in group R and 9.60 ± 1.78 min in group B, $P < 0.05$); duration of sensory and motor block (10.07 ± 0.91 and 9.03 ± 0.89 h in group R and 12.50 ± 1.14 and 10.67 ± 1.18 h in group B respectively, $P < 0.01$) and duration of analgesia (15.30 ± 1.39 h in group R and 18.07 ± 1.66 h in group B). No significant difference was observed in hemodynamics, sedation, side-effects and complications. Variables were compared using Chi-square test for nonparametric data and Student's *t*-test for parametric data.

Rakesh Nigam et al[19] found that the groups were compared regarding quality of sensory and motor blockade, duration of post-operative analgesia and intra and postoperative complications. There was a significant increase in duration of motor and sensory block and analgesia in Group BC as compared to Group BD patients ($P < 0.0001$). No significant side effects were noted. The addition of 150 mcg of clonidine to bupivacaine in supraclavicular brachial plexus block prolongs the duration of motor and sensory block and extends the analgesia period.

Present study found that in Group-BC the mean onset time of sensory block (mean± s.d.) of patients was 10.7500 ± 1.2277 min. In Group-BD the mean onset time of sensory block (mean± s.d.) of patients was 14.0000 ± 1.1711 min. Difference of mean onset time of sensory block in two groups was statistically significant ($p<0.0001$). In Group-BC the mean onset time of motor block (mean± s.d.) of patients was 14.8611 ± 1.3126 min. In Group-BD the mean onset time of motor block (mean± s.d.) of patients was 18.1389 ± 1.5884 min. Difference of mean onset time of motor block in two groups was statistically significant ($p<0.0001$).

We found that in Group-BC the mean duration of surgery (mean± s.d.) of patients was 123.5556 ± 23.8788 min. In Group-BD the mean duration of surgery (mean± s.d.) of patients was 124.7222 ± 23.9435 min. Difference of mean duration of surgery in two groups was not statistically significant ($p=0.8366$). In Group-BC the mean duration of sensory block (mean± s.d.) of patients was 646.8056 ± 157.5489 min. In Group-BD the mean duration of sensory block (mean± s.d.) of patients was 468.5000 ± 47.8596 min. Difference of mean duration of sensory block in two groups was statistically significant ($p<0.0001$).

Krishna SS et al [20] found that the onset of the sensory and the motor block in bother the groups were similar to each other with no statistical difference, but there was a very high significance in the duration of both sensory and motor block within both the groups. The total duration of surgery was also comparable in both groups. The onset of the sensory and the motor block in bother the groups were similar to each other with no statistical difference, but there was a very high significance in the duration of both sensory and motor block within both the groups.

Alarasan AK et al[21] found that the onset of sensory and motor block was significantly earlier in dexamethasone group (10.36 ± 1.99 and 12 ± 1.64) minutes compared to control group (12.9 ± 2.23 and 18.03 ± 2.41) minutes. The duration of sensory and motor block was significantly prolonged in dexamethasone group

(366 ± 28.11 and 337.33 ± 28.75) minutes compared to control group (242.66 ± 26.38 and 213 ± 26.80) minutes. The VAS score was significantly lower in dexamethasone group after 210 min.

We found that in Group-BC the mean duration of motor block (mean± s.d.) of patients was 577.3611 ± 121.3995 min. In Group-BD the mean duration of motor block (mean± s.d.) of patients was 395.7500 ± 21.0189 min. Difference of mean duration of motor block in two groups was statistically significant (p<0.0001).

We found that in Group-BC the mean No of inj# Diclofenac in first 24 hrs (mean± s.d.) of patients was 1.2222 ± .5404. In Group-BD the mean No of inj# Diclofenac in first 24 hrs (mean± s.d.) of patients was 2.1389 ± .3507. Difference of mean No of inj# Diclofenac in first 24 hrs in two groups was statistically significant (p<0.0001).

We found that in Group-BC the mean time to first Diclofenac in first req (mean± s.d.) of patients was 14.2261 ± 2.4024. In Group-BD the mean time to first Diclofenac in first req (mean± s.d.) of patients was 9.2072 ± 2.4293. Difference of mean time to first Diclofenac in first req in two groups was statistically significant (p<0.0001).

Present study found that 11 patients had bradycardia in group-BC and none in group–BD and that was statistically significant.

In Group-BC, the mean HR at 15 min (mean± SD) of patients was 71.5556 ± 16.2612 beats/min. In Group-BD, the mean HR at 15 min (mean± SD) of patients was 78.3333 ± 10.8838 beats/min. Difference of HR at 15 min in two groups was statistically significant (p=0.0414). In Group-BC, the mean HR at 30 min (mean± SD) of patients was 70.1667 ± 15.7053 beats/min. In Group-BD, the mean HR at 30 min (mean± SD) of patients was 79.6944 ± 8.6415 beats/min. Difference of HR at 30 min in two groups was statistically significant (p=0.0021).

Chakraborty S et al[22] found that duration of analgesia was taken as the time from placement of block till injection of rescue analgesic. Analgesia duration was 415.4 +/- 38.18 min (mean +/- standard deviation) in Group A (clonidine) compared to 194.2 +/- 28.74 min in Group B (control). No clinically significant difference was observed in heart rate, blood pressure, and oxygen saturation. Sedation score was higher in the clonidine group. Addition of a small dose of clonidine to 0.5% bupivacaine significantly prolonged the duration of analgesia without producing any clinically important adverse reactions other than sedation.

Ribeiro KS et al[23] found that the duration of analgesia in the group BD was 27.1±13.4 hours and was significantly higher as compared to the group B, in which it was 13.9±11.3 hours (p<0.05). The pulse rate measured Post-operatively between both groups at 20 minutes (p-value 0.634), 60 minutes (p-value 0.888), 120 minutes (p-value 0.904) and 180 minutes (p-value 0.528) showed no statistical significance. Likewise the mean blood pressure measured between the two groups at 20 minutes, 60 minutes, 120 minutes and 180 minutes Post-operatively showed no significance. There was no significant difference in incidence of PONV in both groups with p-value of 0.624. Dexamethasone as an adjuvant to local anaesthetic in brachial plexus blocks significantly, prolongs duration of analgesia in children undergoing upper limb surgeries.

V. Conclusion

Dexamethasone and Clonidine both when added to bupivacaine in supraclavicular brachial plexus block enhanced the onset time of both motor and sensory block but was faster in Clonidine group compared to dexamethasone group.Similarly the duration of sensory and motor block was significantly prolonged in Clonidine group than Dexamethasone group.The time for rescue analgesia was prolonged in both group of patients receiving clonidine and dexamethasone, but it was prolonged in patient receiving clonidine.Clonidine produce some side effect intraoperatively(bradycardia) but that was manageable wheras dexamethasone produces minimal side effects and is relatively safer.Side effects may be associated with doses or individual sensitivity.Further studies to determine the safe,optimal dose of clonidine adding to local anaesthetic for supraclavicular brachial plexus block are required.

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