Original Research Article

Supraclavicular Vs Infraclavicular Approaches of Brachial Plexus Block Using Nerve Stimulator With 30ml Of 0.5% Levobupivacaine and 50µg Dexmedetomidine (Prospective Comparative Analytical Study)

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Abstract :

Introduction : Regional Anaesthesia technique for pain relief with peripheral nerve block is devoid of side effects such as nausea, vomiting, polypharmacy, haemodynamic instability and voiding difficulty inherent to general anaesthesia and provide post-operative analgesia.

Aims : To Compare the ease of technique and efficacy of block between supracvlavicular and infraclavicular approaches for brachial plexus block using nerve stimulator.

Material And Methods : Sixty Patients of age group between 18 to 65 years with asa grade 1 and 2 undergoing upper limb surgeries were randomly allocated into two groups : group sc and group ic. each patient received 30ml of 0.5% levobupivacaine and 50µg of Dexmedetomidine.

Parameter observed were-block performance time, onset of sensory and motor block, duration of block, duration of analgesia, complication ,quality of block and patient satisfaction.

Results : The Results Shows the significant difference in mean time of onset of sensory block. the mean time of onset of sensory block in group ic was 13.17 min and 15.67 min in group sc(p value 0.035).4 patients in group sc had accidental vascular puncture and none in group ic with significant difference in p value i.e 0.038. time to perform block, time of onset of motor block, duration of analgesia and patient satisfaction were not significant in group sc and group ic.

Conclusion : It was concluded that onset of sensory block in infraclavicular group was statistically significantly earlier with less incident of vascular puncture compared to supraclavicular group using nerve stimulator.

Keywords : Supraclavicular block, infraclavicular block, adjuvant (Dexmedetomidine).

Introduction:

Surgical Procedures on the shoulder and upper limb are ideally suited to regional anaesthetic techniques.[1] As they are associated with high degree of success and lesser incidence of complications. Brachial plexus block has evolved as an important tool in the anaesthesiologist's armamentarium as a safe alternative to general anaesthesia for upper limb surgery and for the relief of perioperative pain. Supraclavicular and infraclavicular are the two approaches suited for surgeries of elbow proximally to hand distally.[2]

The Supraclavicular Approach has additional anatomical advantage of blockade at a level where brachial plexus are tightly grouped, which facilitate single point injection. However, high incident of complications such as vascular puncture, pneumothorax and horner syndrome were reported. The Infraclavicular approach with compact anatomical distribution of plexus allowing single

injection with reduced risk of pneumothorax . Levobupivacaine is the pure s (–) enantiomer of bupivacaine and in recent years has emerged as a safer alternative for regional anaesthesia than its racemic parent.[3] Hence levobupivacaine for regional anaesthesia has a lower risk of cardiotoxicity.[4] and neurotoxicity due to its decreased potency at the sodium channels and faster protein binding rate.[5]

Adjuvants[6] are drugs which when co-administered with local anaesthetic agents, may improve the speed of onset and duration of analgesia and counteract the disadvantageous effects of local anaesthetics. By adding adjuvants the dose of local anaesthetic can be further reduced and hence their side effects. In December 1999, Dexmedetomidine was approved as the most recent adjuvent capable of prolonging duration of sensory and motor block produced by nerve blocks by memis and colleagues.[7]

The purpose of the study was to compare supraclavicular block and infraclavicular block in upper limb surgeries using nerve stimulator with 30 ml of 0.5% Levobupivacaine and 50µg Dexmedetomidine.

Materials And Methods

After the approval from hospital ethical committee and written informed consent from patients are included in the study. A prospective, randomized, comparative study conducted in 60 patients of either sex of asa grade i and 2 of age group 1865 years at Government Medical College and Rajindra Hospital, Patiala. After computer generated randomization these patients were divided into two groups with 30 patients in each group as follows: group Sc (Supraclavicular Group) and group Ic (Infraclavicular Group). Each patient Recieved 30 Ml Of 0.5% Levobupivacaine and 50µg Of Dexmedetomidine.

The brachial plexus block was carried out through nerve stimulator guided supraclavicular and infraclavicular approach using kulenkampff technique and coracoid approach respectively depending upon the group to be studied.

Goal is to achieve a hand twitch (preferably flexion of finger and thumb).

Observation And Results:

Statstical Tools: Data analysis was done using spss software. data was expressed as mean ± standard deviation.. quantitave analysis was compared with student ´t test and chi square test. a p value <0.05 was considered significant.

There was no statistical significant difference among the two groups with respect to age ,sex,weight and haemodynamic variation.

Block Performance Time:

Time to perform block in group Sc 5.32 ± 1.20 Min and in group Ic 5.45 ± 0.99 Min. The P Value(0.92) was not Significant I.E >0.05.

Onset of Sensory Block :

Time of onset sensory block in Group Sc 15.67 ± 4.87 Min and In Group Ic 13.17 ± 2.78 Min. The Result was significant with P Value 0.035 (I.E 0.05).

Table-1 Demographic Data

	Group Sc(N=30)	Group Ic(N=30)
Age(Years)	**40.10 ± 12.33**	43.10 ± 12.62
Sex(M/F)	19/11	21/9
Weight(Kg)	68.80 ± 7.94	72.63 ± 7.22
Asa(I/Iı)	30	30

Table-2 Onset of Sensory Block

Groups	Mean	Std. Deviation	Mean Rank	Mann-Whitney U Test	P Value	Sign.
Group Sc	15.67	4.87	34.77	2.114	0.035	S
Group Ic	13.17	2.78	26.23			

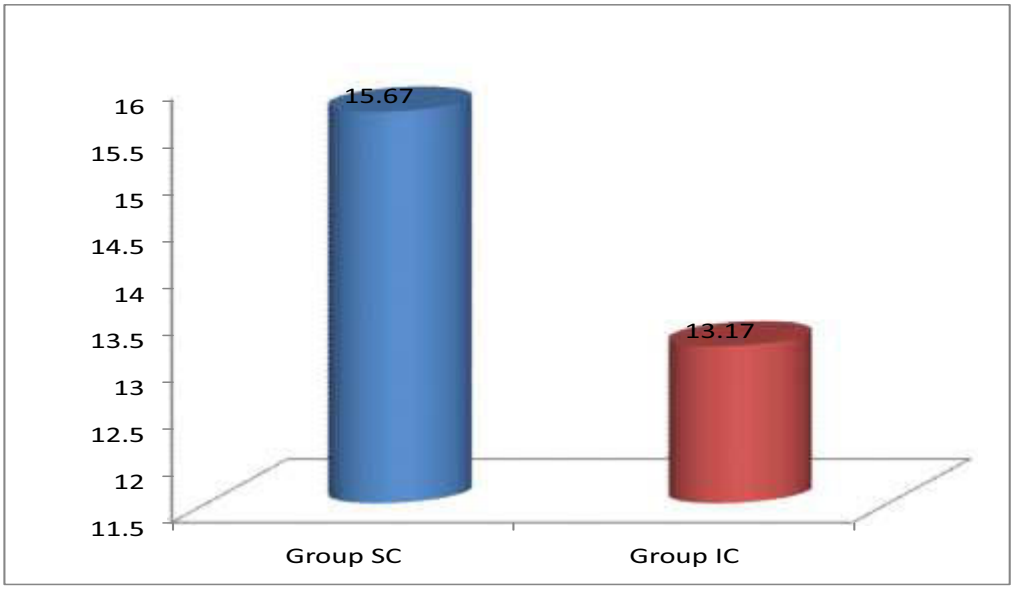

Fig-1 Distribution of Patients According to Onset of Sensory Block

Onset of Motor Block : Time of onset of motor block In Group Sc 22.50 ± 3.15 min and in group Ic 24.00 ± 3.05 Min. The result found out to be non significant (P Value 0.051 I.E >0.05).

Duration of Block : The Duration of sensory block in group Sc 600.67 ± 21.80 Min and in group Ic 597.00 ± 26.67 Min with non significant result I.E P value >0.05. Duration of motor block in group Sc 575.00 ± 22.40 Min and in Group Ic 572.00 ± 23.25 Min (P Value >0.05). Duration of Analgesia: Total Duration of analgesia lasted for 11.00 hours in either group. The result found out to be non significant as P Value 0.221. (I.E >0.05).

Quality of block: Group Sc 1 out of 30 patients has partial effect and none in group Ic the result found out to be non significant as P value 0.313. (I.E >0.05).

Complications: The number of vessel punctures in Group Sc was 4 out of 30 and there was no vessel punctures in group Ic. The P Value was 0.038 (I.E >0.05) which is statistically insignificant.

Table-3 Complications

Complications	Groups	Yes	No	X^2	P Value	Sign.
Bradycardia	Group Sc	0 (0%)	30 (100%)	--	--	--
	Group Ic	0 (0%)	30 (100%)			
Hypotension	Group Sc	0 (0%)	30 (100%)	--	--	--
	Group Ic	0 (0%)	30 (100%)			
Hypoxemia	Group Sc	0 (0%)	30 (100%)	--	--	--
	Group Ic	0 (0%)	30 (100%)			
Pneumothorax	Group Sc	0 (0%)	30 (100%)	--	--	--
	Group Ic	0 (0%)	30 (100%)			
Vascular Puncture	Group Sc	4 (13.33%)	26 (86.67%)	4.29	0.038	S
	Group Ic	0 (0%)	30 (100%)			

Pain	Group Sc	1 (3.33%)	29 (96.67%)	0.00	1.000	Ns
	Group Ic	1 (3.33%)	29 (96.67%)			
Local Anaesthesia Toxicity	Group Sc	0 (0%)	30 (100%)	--	--	--
	Group Ic	0 (0%)	30 (100%)			
Diaphragmatic Palsy	Group Sc	0 (0%)	30 (100%)	--	--	--
	Group Ic	0 (0%)	30 (100%)			
Hornor Syndrome	Group Sc	0 (0%)	30 (100%)	--	--	--
	Group Ic	0 (0%)	30 (100%)			
Hoarseness Of Voice	Group Sc	0 (0%)	30 (100%)	--	--	--
	Group Ic	0 (0%)	30 (100%)			

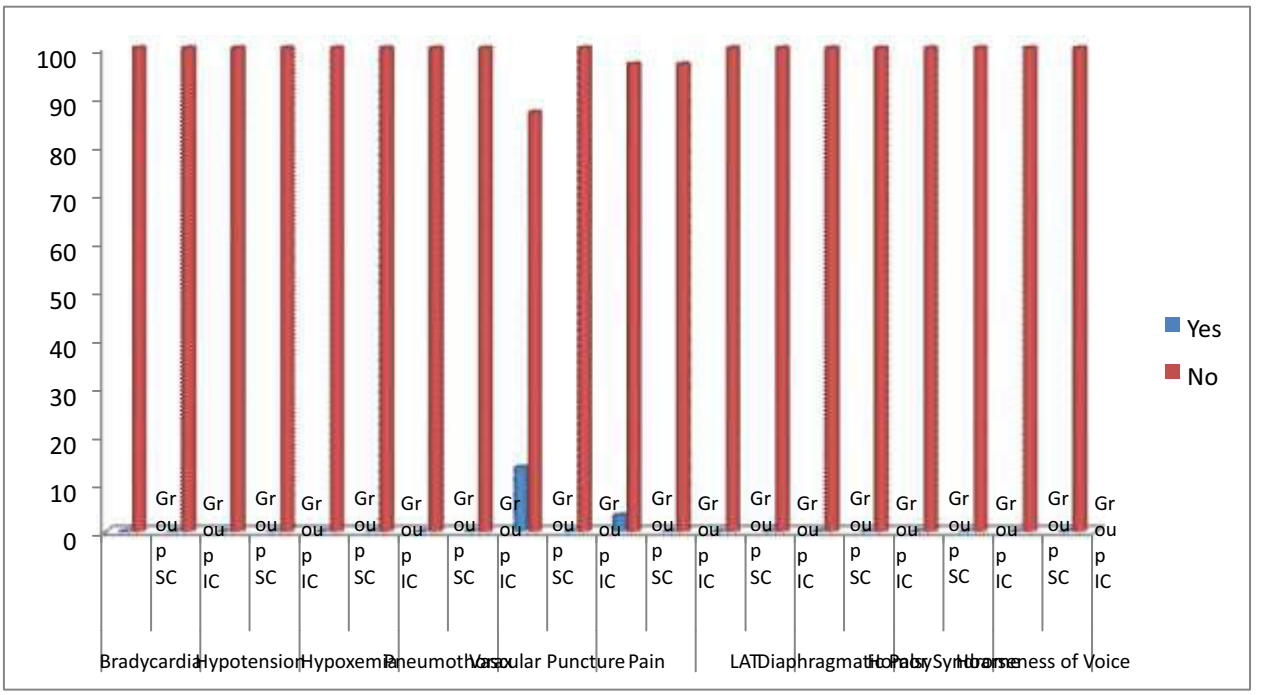

Fig.2-Distribution Of Patients According To Complications

Discussion:

In our study, the supraclavicular and infraclavicular approach to brachial plexus shows no significant difference in block performance time with p value 0.92. the comparative study conducted by arcand et al.[8]. and niranjan.k..[9] of supraclavicular and infraclavicular block also reported no significant difference in either group in block performance time.

The time of onset of sensory block in our study found out to be significant .the mean time of onset sensory block in group sc 15.67±4.87 min and in group ic 13.17±2.78 min with p value 0.035(i.e 0.05).in consistant with study z.j.koscielniak-nielson et al.[10] however time of onset of motor block was comparable and no significant difference among two groups with p value 0.051.

The incident of vascular punctures was 4 out 30 patients in group sc with p value 0.038.but none of them resulted in serious complication.the result were similar to study done by ranganathan jothi abhinaya et al.[11].

The duration of analgesia, quality of block

and patient satisfaction score was found out to be comparable in both the group with insignificant p value.

Conclusion

In was concluded that both the supraclavicular and infraclavicular approaches to brachial plexus block had similar clinical efficacy but the mean time of onset of sensory block in infraclavuicular group was significantly earlier with less incidents of vascular puncture as compared to supraclavicular group.while supraclavicular block has potential fear of life threatning complication pneumothorax while no such complication to exist in infraclavicular block.

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