Original Research Paper

Volume - 11 | Issue - 04 | April - 2021 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Anaesthesiology

COMPARISON OF THE EFFICACY OF INTRAVENOUS NALBUPHINE AS AN ADJUVANT TO SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK FOR ADULT PATIENTS POSTED FOR UPPER LIMB SURGEY

Dr. Shwetha .V — Post graduate and JR, Department of Anaesthesiology, K.V.G Medical college and hospital ,kurunjibagh, sullia DK,Karnataka , India.

Dr .Anish Sharma.N.G* — Associate professor, Department of Anaesthesiology, K.V.G Medical college and hospital ,kurunjibagh, sullia DK,Karnataka , India. *Corresponding Author

ABSTRACT

Introduction:

- Brachial plexus block (BPB) is a routinely performed regional anaesthesia technique for surgeries involving upper limb, especially below mid-arm orthopaedic procedures
- There were several studies in which nalbuphine had been used via various routes without any report of neurotoxicity
- Hence present study was planned to compare the efficacy of iv nalbuphine as an adjuvant to supraclavicular block for adult patients posted for upper limb surgery

Aim : To compare the efficacy of iv nalbuphine as an adjuvant to supraclavicular brachial plexus block.

Nalbuphine is effective when used as an adjuvant to local anaesthetics as it prolongs the duration of block.Hence present study was planned to compare the efficacy of iv nalbuphine as an adjuvant to supraclavicular BPB.

Objectives: efficacy will be checked based on onset &duration of sensory & motor block, duration of postop analgesia as per VAS score of pain.

Methods: prospective comparative study, after ethics committee clearance,60pts belonging to ASA I &ASA II randomly allocated in to 2 groups of 30 each Group N received 0.375% bupivacaine 20ml+ 5ml 1% lignoadrenaline + iv nalbuphine 1 ml .Group C received 0.375% bupivacaine 20ml +5 ml 1% + 5ml normal saline 0.9% .onset ,duration of motor & sensory block & duration of analgesia, any side effects if any were recorded.

Results: The demographic data were comparable for both the groups.comparision between 2 groups were performed using student T test.P value is <0.0001 considered statistically significant.Onset time of sensory (5.26±1.01min vs 14.64±1.25min)& motor block(8.06±0.78 min vs 18.00±1.26 min) in Group N was significantly prolonged than Group C (P<0.0001). The mean duration of sensory (376.56±4.54 min vs 164.6±2.57 min) & motor block(317.4±3.97 min vs147.22±5.16 min) in Group N was significantly prolonged than Group C(P<0.0001). The mean duration of analgesia for Group N &Group C 389.73±5.31 min & 174.38±1.99 min respectively P <0.0001.No side effects was seen in either group.

Conclusion: nalbuphine as an adjuvant to bupivacaine in supraclavicular BPB prolongs the duration of block and duration of analgesisa& shortened onset time.

KEYWORDS : Nalbuphine ,supraclavicular block, VAS

INTRODUCTION

- Brachial plexus block (BPB) is a routinely performed regional anaesthesia technique for surgeries involving upper limb, especially below mid-arm orthopaedic procedures
- Nalbuphine is effective when used as an adjuvant to local anaesthetics in spinal,epidural and IV block as it significantly prolongs the block duration as it significantly prolongs the block duration.[1]
- There were several studies in which nalbuphine had been used via various routes without any report of neurotoxicity.[23 45]
- Nalbuphine is 14-hydroxymorphine derivative with a strong analgesic effect with mixed κ agonist and μ antagonist.
- The analgesic effect of nalbuphine has been found to be equal to the analgesic effect of morphine but unlike it has a ceiling effect on respiration.
- Nalbuphine has the potential to maintain or even enhance μ-opioid-based analgesic effect while simultaneously mitigating the μ-opioid side effects.
- Intravenous nalbuphine has not used in supraclavicular brachial plexus block.
- Hence present study was planned to compare the efficacy of iv nalbuphine as an adjuvant to supraclavicular block for adult patients posted for upper limb surgery

OBJECTIVES OF THE STUDY

To compare the efficacy of ivnalbuphine as an adjuvant to supraclavicular block foradult patient posted for upper limb surgery.

Efficay will be checked based on these parameters.

- Onset time and total duration of sensory blockade and motor blocked.
- Duration ofpost operative analgesia as per Visual Analogue Scale(VAS) score for pain
- Complication/side effects if any.

METHODOLOGY

SOURCE OF DATA : All patients aged 18 to 60yrs of age undergoing upper limb surgery at K.V.G Medical college and Hospital, sullia from March to October 2019 will be included in the study.

STUDY PERIOD: March 2019-October 2019

STUDY DESIGN: Prospective comparative study.

SAMPLE SIZE:60(divided into two groups of 30 each)patients. Sample size is calculated using this formula

SAMPLING METHOD :simple random sampling

STATISTICAL ANALYSIS : SPSS version used to enter data and statistical analysis.comparison between two groups were performed using student t-test.P value less than 0.0001 was considered statistically significant.

METHODS OF COLLECTION OF DATA

- Sixty patients of American society of Anaesthesiologists (ASA)physical status I ASA II aged 18 to 60 yrs of age posted for upper limb surgery will be included in the study institution after obtaining Ethics committee clearence and informed written consent from the patient.

INCLUSION CRITERIA:

- Patients undergoing upper limb surgery
- Patients in the age group of 18 to 60 years of age and weight of 45 to 75kg
- American Society of Anaesthesiologist physical status I and II

EXCLUSION CRITERIA:

- Refusal by the patient
- History of allergy to any of the drugs used in the study
- Infection at the block site
- Patients with history of bleeding disorders or abnormal coagulation profile.
- Patients with sensory or motor deficit in the limb before surgery
- Patients with cognitive imparirment or psychiatric diseases
- Pregnancy
- Failure of block

Allocation to different groups

Sixty patients who fulfil the above criteria will be selected for the study and will be randomized into two groups of 30 patients each using

computer generated random number and concealed by sealed envelop technique.

GROUP	CONTROL	STUDY GROUP
BLOCK SOLUTION	20ML BUPIVACAINE 0.375%+5ML 1% LIGNOADRENALINE	20ML BUPIVACAINE 0.375% +5ML 1% LIGNOADRENALINE
INTRAVENOUSSOLUTION	5ML NORMAL SALINE 0.9%	1ML NALBUPHINE

METHODS

- At the time of pre-anaestheticcheckup,patient history is noted,general physical and systemic examination is carried out.they will be explained about the procedure and VAS score in their native language, the nature of the study and their initials will be obtained on the informed consent form.patients will be premedicated on the night before surgry with Tab.pantoprazole 40mg and tablet Alprazolam 0.5mg and will be kept fasting 6h prior to surgry.

On the day of surgery,all patients will be received 30min prior to the scheduled time of surgery and will be explained once again theproceure and about the VAS pain scoring method.[11]

A 18G iv line will be secured .started iv fluid ringer lactate @20ml/hr. After shifting to operation theatre,standard monitoring will be carried using multiparameter monitoring having pulse oximetry, Electro CardioGraphy and NonInvasive Blood pressure.

All patients receive 1mg midazolam before the procedure.Intravenous injection will be started as soon as patients are positioned for brachial plexus block and under ultrasound guidance,brachial plexus will be identified and the drugs will be injected using a 22G, 2inch stimuplex needle after negative aspiration, under all standard aseptic precaustions.

Sensory and motor blocks are assessed every 5 min after the block by an observer of the study group to which the patient belongs, till complete sensory and motor block is attained.After that, the block characteristics are assessed every 30 min during the surgery.The extent of sensory block will be assessed in the median,radial,ulnar, and musculocutaneous nerve distribution using 3-point score:

0=loss of sensation to light touch
1=loss of sensation to pinprick
2=normal sensation/sharp pain felt.

Theextentof motor block will also be tested in the distribution of the median,radial,ulnar, and musculocutaneous nerves using a 3 point score,where

0= paralysis /no movement
1= paresis
2=normal power.

Block success is defined as the achievement of sensory and motor scores of 1or less in all 4 nerve distribution within 30min of perineural solution.

Patients who don't attain successful block in 30min be will be given generalanaesthesia and excluded from the study group

After the surgery, patients will be followed up in the Post Anaesthesia Care Unit(PACU) hourly to assess motor recovery,sensory recovery, Ramsay sedation scale and VAS score for pain

Sedation will be assessed using Ramsay'sSedation score

Ramsay Sedation Scale score

1	Patientisanxious,agitated,orrestless
2	Patient is cooperative, oriented, and tranquil alert
3	Patient responds to commands
4	Asleep, but with brisk response to light glabellar tap or loud auditory stimulus
5	Asleep, sluggish response to light glabellar tap or loud auditory stimulus
6	Asleep, noresponse

VAS score for pain as follows

PAIN INTENSITY	WORD SCALE
0	No pain
1-2	Least pain
3-4	Mild pain
5-6	Moderate pain
7-8	Severe pain
>9	Excruciating pain

Time of motor recovery will be noted when the motor recovery score is 2(normal power).Time is also noted when the patients attains a VAS score of more than or equal to 4 and is taken as the study end point.Inj tramadol 1.5mg/kg will be administered IV as rescue analgesic.

Onset of action :sensory and motor blockade

Sensory block : The time interval between administration of local anaesthetics solution to loss of pinprick sensation in median, radial, ulnar and musculocutaneous nerve distribution

Motor block: The time interval between administration of local anesthetics solution to loss of movement in median ,radial ,ulnar and musculocutaneous nerve distribution.

Duration of blockade : Sensory block (duration of analgesia): time interval between onset of sensory block till thepatients first reports VAS score of more than or equal to 4

Motor block: Time interval between loss of movement to appearance of normal power

Duration of blockade : Sensory block (duration of analgesia): time interval between onset of sensory block till thepatients first reports VAS score of more than or equal to 4

Motor block: Time interval between loss of movement to appearance of normal power.

RESULT

- The demographic data were comparable for both the groups.comparisionbetween 2 groups were performed using student T test. P value is < 0.0001 considered statistically significant.
- Onset time of sensory (5.26 ±1.01min vs 14.64±1.25min) and motor block(8.06±0.78 min vs 18.00±1.26min) in group N was significantly prolonged than group C(P<0.0001).
- The mean duration of sensory (376.56±4.54 min vs 164.6 ±2.57min) and motor block(317.4±3.97 min vs 147.22 ±5.16min) in group N was significantly prolonged than group C(P<0.0001).
- The mean duration of analgesia group N and group C 389.73±5.31 min and 174.38±1.99min respectively P<0.0001. No side effects was seen in either group.

DISCUSSION

- Result of this study shows that i.v nalbuphine10mg(1ml) when given as an adjuvant to 0.375% bupivacaine 20ml and 5ml 1% lignoadrenaline in supraclavicular block hastens the onset and prolongs the duration of moto and sensory block also duration of analgesia, without any haemodynamic instability.
- Nalbuphine is a semisynthetic opiod with mixed k agonist and μ antagonist properties
- Nalphuphine is also popular in producing analgesia during monitored anaesthesia care.
- Success and nontoxicity of the drug in subarachnoid and epidural route ensure that the drug can safely be used perineurally in peripheral nerve.
- So in our study we have used i.vnalbuphine in supraclavicular block.

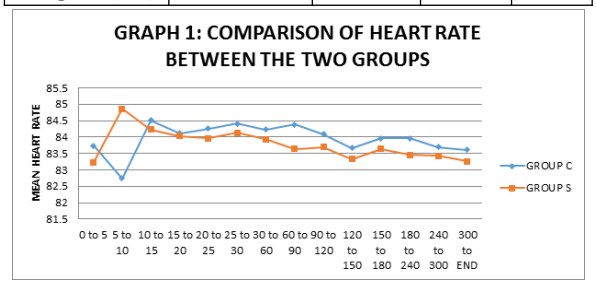
Chiruvella et al [6] conducted a doubleblind,randomized trial on One hundred adult patients undergoing upper-limb surgeries under supraclavicular BPB ,concluded that a higher dose of nalbuphine in BPB hastens the onset, and prolongs the duration of sensorimotor blockade and analgesia, without any significant side effect.

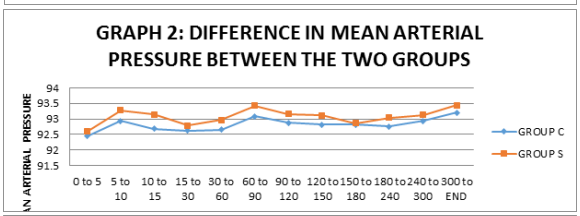
Naziret al[8] conducted Randomized controlled trial, involving sixty patients of either sex undergoing elective orthopedic procedures of upper limb.

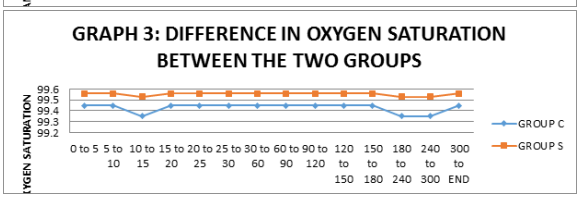
Nalbuphine when added to bupivacaine as an adjuvant in supraclavicular block significantly shortened the onset of sensory and motor block and enhanced the duration of sensory and motor block and duration of analgesia

Onset, Duration of Sensory and Motor Block and Duration of Analgesia in both the groups

PARAMETERS	Group C Mean ± SD	Group N Mean ± SD	T VALUE	P VALUE
Onset of sensory block (min)	14.64 ± 1.25	5.26 ± 1.01	31.9694	<0.0001
Onset of motor block (min)	18.00 ± 1.26	8.06 ± 0.78	36.7393	<0.0001
Duration of sensory block (min)	164.96 ± 2.57	376.56 ± 4.54	222.1571	<0.0001
Duration of motor block (min)	147.22 ± 5.16	317.4 ± 3.97	143.1711	<0.0001
Duration of analgesia (min)	174.38 ± 1.99	389.73 ± 5.31	208.0047	<0.0001







CONCLUSION:

nalbuphine as an adjuvant to bupivacaine in supraclavicular BPB prolongs the duration of block &duration of analgesia and shortened onset time.

REFERENCES:

1. NazirN,Jain S. Randomized controlled trial for evaluating the analgesic effect of nalbuphine as an adjuvant to bupivacaine in supraclavicular block under ultrasound guidance. AnesthEassys Res2017,11:326-9
2. Abdelhaq M M,Elramely A M.Effect of nalbuphine as adjuvant to bupivacaine for ultrasound guided supraclavicular brachial plexus block.open journal of anaesthesiologyvol 6 no 3(2016) Article ID:64636
3. Gupta K, Jain M, Gupta PK, Rastogi B, Zuberi A, Pandey MN. Nalbuphine as an adjuvant to 0.5% bupivacaine for ultrasound-guided supraclavicular brachial plexus blockade. Indian J Pain 2016;30:176-80.
4. Pick CG, Paul D, Pasternak GW. Nalbuphine, a mixed kappa 1 and kappa 3 analgesic in mice. J Pharmacol Exp Ther. 1992;262:1044–50. [PubMed]
5. Gunion MW, Marchionne AM, Anderson TM. Use of the mixed agonist-antagonist nalbuphine in opioid based analgesia. Acute Pain. 2004;6:29–39
6. Chiruvella S, Konkyana SK, Nallam SR, Sateesh G. Supraclavicular brachial plexus block: Comparison of varying doses of nalbuphine combined with levobupivacaine: A prospective, double-blind, randomized trial. Anesth Essays Res 2018;12:135-9