ORIGINAL RESEARCH PAPER

Anesthesiology

COMPARITIVE STUDY ON TWO DOSES OF CLONIDINE ADDED TO HYPERBARIC BUPIVACAINE IN SPINAL ANAESTHESIA

KEY WORDS:

Dr. N Krishnan MD, DA

Dr. Kayalvizhi K B* MD *Corresponding Author

ABSTRACT

BACKGROUND: Various adjuvants have been added to bupivacaine to prolong duration in spinal Anesthesia. Aim of our study is to compare two doses of clonidine (40mcg and 60mcg) added to 0.5% hyperbaric bupivacaine 2.75ml intrathecally for sub umbilical surgeries. MATERIALS AND METHODS :60 patients enrolled in the study are divided into 3 groups of 20 each. Group B received 2.75ml of 0.5% hyperbaric bupivacaine with 0.4ml saline. Group C1 received 2.75ml of hyperbaric bupivacaine with 40mcg of clonidine. Group C2 received 2.75ml of hyperbaric bupivacaine with 60mcg of clonidine. The groups were comparable with respect to age, height and weight. The onset of sensory and motor block was faster in group C2 compared to other groups. The duration of analgesia is definitively more in group C2. CONCLUSION: 60 mcg of clonidine added to bupivacaine is a better adjuvant in prolonging sensory and motor block intra operatively and duration of effective post-operative analgesia compared to 40 mcg without significant adverse effects.

INTRODUCTION

Local anesthetics are commonly used in spinal anesthesia and variety of adjuvants have been tried to prolong the duration. Clonidine, a selective partial alpha 2 agonist is a good adjuvant which has proven to prolong both sensory and motor block and without any opioid related side effects. Various doses of clonidine have been tried. In our study we have compared 40 and 60 mcg added to hyperbaric bupivacaine in sub umbilical surgeries.

MATERIALS AND METHODS:

The study was approved by the hospital ethical Committee, and informed consent from all the participants was obtained. Sixty patients of either sex in age group 20 to 50 years belonging to ASA PS 1 and 2 posted for infra umbilical surgeries are included in the study. Exclusion criteria were ASA 3 and 4 cases, those with renal and hepatic dysfunction, allergic to drugs and those who refused to participate in the study.

60 patients were included in this double blinded randomized controlled study and patients were divided into 3 groups.

Patients in group B received 2.75ml of 0.5% hyperbaric bupivacaine plus 0.4 ml saline.

Patients in group C1 received 2.75ml of hyperbaric bupivacaine with 40 mcg of clonidine.

Patients in group C2 received 2.75ml of hyperbaric bupivacaine with 60mcg of clonidine.Relevant history clinical examination and investigations were done. Written informed consent was obtained from all patients included in the study. Allotment of cases was done by computerized lots. The consultant who made the drug combination took no further part in the study. Another consultant performed the subarachnoid block and made intraoperative observations. Postoperatively in the recovery room also observations were made.

In the operation theatre, all equipment and emergency drugs were kept ready. Patients were given oral diazepam 5mg 2hrs prior to surgery. Routine monitors pulse oximetry, NIBP, ECG were attached. Preoperative baseline pulse rate, Blood pressure, saturation and respiratory rate were recorded. Under strict aseptic precautions subarachnoid block was performed in sitting or lateral decubitus position in all patients. The parameters observed were sensory blockade, motor blockade, duration of analgesia and sedation. Vitals like pulse, blood pressure, saturation and respiratory rate were recorded every minute for 5 mins and then every 5mins throughout the intraoperative period. Hypotension is defined as fall in systolic BP more than 30% from baseline or MAP less than 60mmHg. This was managed with inj ephedrine 6mg increments. Bradycardia was defined as HR less than 60/min and was managed with inj atropine 0.01mg/kg i.v Respiratory depression defined as RR less than 8/min and or saturation less than 85%. This was planned to be managed with bag and mask ventilation or intubation and IPPV if necessary. Blood loss more than allowable loss was replaced with blood. The occurrence of sedation was assessed with ramsay score.

In the recovery room, vitals were recorded every 15mins for 1st hour after surgery, every 30 minutes for next 2hrs and hourly intervals for next 3 hours. Sensory and motor block assessment were done every 15 minutes till recovery of pinprick sensation to L1 and bromage scale of 1 respectively. Pain was assessed using VAS score every 15mins. When score was greater than 4, rescue analgesic inj diclofenac 75mg im was given. Duration of effective analgesia was defined as time interval between onset of SAB and time to reach VAS greater than 4.

OBSERVATIONS AND RESULTS:

All recorded data were entered using MS Excel software and analyzed using STATA software for determining the statistical significance. Analysis of variance was used to study the significance of mean of various study parameters between the three groups. Students t test was used to compare the groups on mean values of various parameters. The p value taken for significance is 0.05.

The groups were comparable with respect to their age and weight. There is difference among groups with regard to height, it may be due to less sample size. The mean duration of surgery is higher in group C1 compared to other two groups. However, there is no statistical significance among the groups.

DURATION OF SURGERY

PARAMETERS	GROUP B	GROUP C1	GROUP C2
NO of cases	20	20	20
Mean	100.5	118.5	20
S. D	39.53	45.11	33.64

DURATION OF MEAN ONSET OF SENSORY BLOCK

PARMETERS	GROUP B	GROUP C1	GROUP C2
No of cases	20	20	20

Mean	103	177.25	156.25
S. D	10.809	43.542	32.23577

DISTRIBUTION OF MEAN ONSET OF MOTOR BLOCK

PARAMETERS	GROUP B	GROUP C1	GROUP C2
No of cases	20	20	20
Mean	177.25	199	193.150
S.D	18.6007	15.61	11.663

DISTRIBUTION OF MAX SENSORY BLOCK AMONG GROUPS

PARAMETERS	GROUP B		GROUP C1		GROUP C2	
	No	%	No	%	No	%
T4	0	0	6	30	10	50
T5	1	5	1	5	0	0
T6	10	50	9	45	10	50
T8	9	45	4	20	0	0

DISTRIBUTION OF CASE BY GROUPS AND GRADE OF MAXIMUM MOTORBLOCK

PARAMETERS	GROUP B	GROUP C1	GROUP C2
No of cases	20	20	20
Mean	4	4	4
S. D	0	0	0

DISTRIBUTION OF MEAN DURATION OF MOTOR BLOCK

PARAMETERS	GROUP B	GROUP C1	GROUP C2
No of cases	20	20	20
Mean	188.75	263.25	284.5
S. D	13.848	12.904	16.693

DISTRIBUTION OF MEAN DURATION OF ANALGESIA

PARAMETERS	GROUP B	GROUP C1	GROUP C2
No of cases	20	20	20
Mean	219.25	305.75	314
S. D	9.215	17.341	28.635

DISTRIBUTION OF SIDE EFFECTS

EFFECTS	GROUP B		GROUP C1		GROUP C2	
	NO	%	NO	%	NO	%
HYPOTENSION	2	10	1	5	2	10
BRADYCARDIA	1	5	1	5	2	10
SEDATION	0	0	10	50	20	100
DRYNESS OF MOUTH	0	0	1	5	2	10

There is a significant difference between the groups with regard to onset of sensory block, with group C2 having a rapid onset compared to C1. There is also significant difference between the groups in onset of motor block. Group C2 has a faster onset compared to C1. Maximum sensory block of T4 was observed in 50% of cases in group C2 and 30% of cases in C1. There is no difference between the groups in grade of maximum motor block. There is significant difference between the groups in two segment regression with C2 having a much longer time compared to C1. There is a significant difference between the groups in duration of motor block with group C2 (284.5 mins) having longer duration compared to C1(263.25mins). There is a significant difference between the groups in total duration of analgesia with C2 having a much longer duration (305.75mins) compared to C1 (219.25mins). There is no statistically significant difference among groups with respect to hemodynamics.

DISCUSSION

Clonidine an alpha 2 agonist added to local anaesthetics has been shown to provide excellent surgical anaesthesia. Use of high doses is often met with hemodynamic fluctuations hence we chose to compare slightly lower doses which are both optimal and with minimal side effects.

The mean onset of sensory block is significantly prolonged in group C1. This contrasts with a study by Klimscha et al[1] who studied intrathecally administered 0.5% bupivacaine with 150mcg clonidine versus plain bupivacaine and showed there is no difference between the groups. There is no significant difference between the groups with respect to onset of motor block. This correlates with the study by Acalvoschi lurie et al[2]. There is statistically no difference between the groups in maximum level of sensory and motor block. This contrasts with study by De kock et al[3] and Klimscha et al. The possible reason could be the higher dose of clonidine around 75 and 150 mcg used in these groups compared to the 40 and 60 mcg used in our study.

The mean time taken for two segmental regression was 211 mins in group C2 compared to 187.5mins in group C1. Group C2 had significantly prolonged time for two segmental regression compared to C1. This correlated with the study by Fogarty et al[4] and Fakuda et al[5]. The mean duration of motor block was 263mins in group C1 compared to 284mins in group C2. this was statistically significant. This correlates with study by Dobrydnjov et al[6] where clonidine combined with small dose bupivacaine was used in inguinal herniorrhaphy prolonged motor block. The mean duration of analgesia was 305mins in group C1 compared to 314mins in group C2. This difference is statistically significant compared with control group B. This correlates with study by Stephen srebel[7] where he studied small dose intrathecal clonidine and isobaric bupivacaine for orthopedic surgeries. There was significant prolongation of analgesia. Dobrydnjov also showed that clonidine added to bupivacaine for inguinal herniorrhaphy had prolonged analgesia compared to control group. Study by Mercier et al[8] and Gautier et al[9] showed addition of clonidine to sufentanil in labor significantly prolonged analgesia.

CONCLUSION

In conclusion addition of clonidine as an adjuvant to bupivacaine in subarachnoid block prolongs duration of both sensory and motor block. I conclude that 60 mcg of clonidine hydrochloride added to local anaesthetic in subarachnoid block has proved to be a better adjuvant prolonging the sensory and motor blockade intraoperatively and duration of effective post-operative analgesia compared to 40 mcg without significant adverse effects.

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