Volume-6, Issue-1, January - 2017 • ISSN No 2277 - 8160 IF : 3.62 | IC Value 80.26

Original Research Paper Anaesthesiology

A COMPARATIVE STUDY BETWEEN BUPIVACAINE AND BUPIVACAINE CLONIDINE COMBINATION IN SPINAL ANAESTHESIA IN LOWER LIMB SURGERIES

Dr Manisha Thakkar M.D. consultant anaesthesiologist, shalby hospital, Ahmedabad.

Dr Manisha Kapdi Associate Professor, NHL medical college, Ahmedabad.

ABSTRACT

Background and aims: *Intrathecal clonidine prolongs sensory and motor effect of intrathecal bupivacaine for spinal anaesthesia.* ***Methods:*** *A randomised controlled trial of 60 patients (30 in each group) was conducted in patients posted for lower limb surgeries under spinal anaesthesia. In group A 0.5% heavy bupivacaine 3 ml (15 mg) + NS (0.3 ml) and in Group-B 0.5% heavy bupivacaine 3 ml (15 mg) + preservative free clonidine 0.3 ml (45 µg) given intrathecally. Time of onset of sensory and motor blockage, per and postoperative hemodynamics, time of regression of sensory and motor blockage and first requirement of rescue postoperative analgesic were noted.* ***Results:*** *In randomised controlled study time to onset of sensory and motor block was rapid in group A than group B(P<0.001). Total duration of sensory and motor blockade was higher in group B patients as compare to group A(P<0.001). Time to first rescue analgesic was prolonged in group B patients (392 + 34.21 minutes) as compare to group A patients (251 + 24.04 minutes).* ***Conclusion:*** *Clonidine 45µg seems to be attractive, alternative as adjuvant to intrathecal hyperbaric bupivacaine heavy(0.5%) which markedly prolongs duration of sensory and motor blockage, provides excellent quality of postoperative analgesia with minimum hemodynamic changes and adverse reaction.*

KEYWORDS :

INTRODUCTION

The international association for the study of pain has defined pain as unpleasant and emotional experience associated with actual or potential tissue damage or described in terms of such damage

Spinal anaesthesia is preferred over general anaesthesia for lower limb surgeries as it is simple to perform and economical, produces rapid onset of anaesthesia, analgesia with good muscle relaxation, causes better suppression of neuroendocrine stress response and prevents risk of aspiration of gastric contents. All these advantages of spinal anaesthesia are offset by complain of postoperative pain when effect of local anaesthesia wears off due to relatively shorter duration of action of local anaesthetic drug.

Various intrathecal adjuvants have been tried with local anaesthetic agent to prolong It's duration of action. The adjuvants action is directed towards decreasing sensory input to CNS. Their site of action is different from that of Local Anaesthetic Agent. As opioid receptors are present in the spinal cord, addition of opioid to local anaesthetic agent in regional anaesthesia provides analgesia in perioperative period. Clonidine, a centrally acting partial α2 adrenergic agonist has been extensively evaluated as an alternative intrathecal adjuvant and proven to be a potent analgesic.

This study was undertaken to evaluate efficacy and potency of intrathecally administered bupivacaine and bupivacaine with clonidine on onset of sensory and motor blockade, hemodynamic stability, duration of block, postoperative pain relief and side effects in lower limb surgeries.

METHODS

The study was conducted by taking 60 randomly selected patients for lower limb surgeries. Patients belonged to ASA Grade I/II aged 18 to 60 years. Patient having history of allergy to any drug or contraindications for spinal anaesthesia are excluded from study. Patients were divided into 2 groups.

Group-A : 0.5% heavy bupivacaine 3 ml (15 mg) + NS (0.3 ml)
Group-B : 0.5% heavy bupivacaine 3 ml (15 mg) + preservative free clonidine 0.3 ml (45 µg)

Detailed preoperative history, physical examination and laboratory investigation like CBC, RBS, RFT, serum electrolyte and patient's ECG and chest x ray reviewed. IV line taken ,standard monitoring (pulse oxymetry, ECG, NIBP) were applied and patients were preloaded with 10 ml/kg RL solution before procedure. Under all strict aseptic and antiseptic precaution, with patient in left lateral position lumber puncture was performed at L2-L3 or L3-L4 intervertebral space with 25G Quincke needle and selected drug was given slowly after free flow of clear CSF. After completion of procedure, patient was immediately turned to supine position. Time of subarachnoid injection of drug was noted. Pulse, BP, SPO2 and RR were recorded every 1, 5, 10, 15, 20, 25, 30, 45 and 60 minutes after giving spinal anaesthesia and then every 30 minutes till the completion of surgery.

The onset and duration of sensory blockade was assessed by using pinprick test every 1 minute till 15 minutes. Then at 20, 30, 45 and 60 minutes and then every 30 minutes till completion of surgery. Motor blockade was assessed by modified bromage score.

Bromage criteria		
Scale	**Criteria**	**Degree of block**
0	Free movement of legs and feet with ability to raise extended legs.	None
1	Inability to raise extended leg and knee flexion decreased, but full flexion of feet and ankle is present	Partial (33%)
2	Inability to raise leg or flex knees, but flexion of ankle and feet present.	Partial (66%)
3	Inability to raise leg, flex knees or ankle or move toes.	Complete paralysis

Time for onset of sensory dermatome T10 and grade 3 motor blockage and time of sensory regression to S2 and motor regression to bromage 0 was noted. Patients were observed for any intraoperative complications like bradycardia, hypotension, sedation, shivering, nausea, vomiting, dryness of mouth and respiratory depression. After surgery, patients were monitored every hourly for 12 hours. Postoperatively pain measurement was assessed by VAS scale, S2 segment regression and first rescue analgesic requirement.

RESULTS

Table-1:Mean onset time of sensory and motor blockage

	Group A	Group B
Time to onset of sensory block (Mean + SD) minutes	3.63 ± 1.15	6.53 ± 1.19
Time to achieve Grade 3 block	6.53 ± 1.63	10 ± 2.10

Highest level of sensory blockade was T_8 in both the groups. Time to onset of sensory and motor block was rapid in group A than group B. Total duration of sensory and motor blockade was higher in group B patients as compare to group A patients. There was fall in pulse rate and blood pressure in both the groups after spinal blockade but there was statistically significant fall in pulse rate after 20 min which last upto 45 min in group B patients as compare to group A patients and there was statistically significant fall in blood pressure after 30 min upto 1 hour in group B patients as compare to group A patients($P<0.05$). After that hemodynamic parameters were comparable in both the groups. Time to first rescue analgesic was prolonged in group B patients (392 ± 34.21 minutes) as compare to group A patients (251 ± 24.04 minutes).

Table-2:Duration of sensory and motor blockage

	Group A	Group B
Duration of regression of sensory block to S2 dermatome(Mean ± SD)minutes	199.3 ±19.37	292.5 ±35.56
Time taken for Grade 3-0 level (Mean ± SD)minutes	159 ± 26.17	256.5 ±30.62

Table-3 Time to First Rescue Analgesic in Minutes

Time in Minutes	No. of Patients	
	Group A	Group B
200-250	14	0
251-300	16	0
301-350	0	5
351-400	0	12
401-450	0	11
451-500	0	1
Minimum Time	200	320
Maximum Time	285	460
Mean time ± S.D.	251 ± 24.04	392 ± 34.21

DISCUSSION

Spinal anaesthesia is the preferred anaesthesia technique for lower limb surgeries since many decades. Bupivacaine is the most commonly used local anaesthetic in spinal anaesthesia. The use of adjuvants with local anaesthetics provides prolonged and superior quality of anaesthesia and postoperative analgesia with relatively small less requirement of rescue analgesia. We selected 60 patients of ASA grade I and II undergoing lower limb surgeries and divided into 2 groups of 30 patients in each. Group-A Bupivacaine heavy 5% 3ml(15 mg) + NS 0.3 ml. Group-B Bupivacaine heavy 5% 3 ml(15 mg)+ clonidine 0.3 ml(45 µg).

In our study the onset of sensory blockade in group A patient is 3.63±1.15 min and in group B patients it is 6.53±1.19 min. The difference between these 2 groups is statistically significant as mentioned in earlier section. The result of our study is identical to B.S.Sethi et al[1]. They studied 60 patients and evaluated the effect of low dose 1µ/kg, intrathecal Clonidine as adjuvant to Bupivacaine and found that the onset of action was clinically and statistically significant with faster onset in Clonidine group compared to Bupivacaine groups.

In our study the onset of motor blockade in group A patient is 6.53±1.63 min and in group B patients it is 10±2.10 min. Ghodki PS et al[6] in 2010 studied 30 µg of clonidine intrathecally and concluded that it has no effect on the onset of sensory and motor blockade. In our study the difference between 2 groups is statistically significant($p<0.001$). The difference in the result of our study and Ghodki PS et al[6] may be due to different dosage of clonidine.

In our study the duration of regression of sensory blockade to S2 dermatome in group A patient is 199.3±19.37 min and in group B patients it is 292.5±35.56 min. Our result is comparable to the study of Kanazi GE et al[5] in 2006. They observed mean time of sensory regression to the S1 segment was 272 ± 38 min. in clonidine 30 µg group.

In our study total duration of motor blockade in group A patient is 159±26.16 min and in group B patients it is 256.5±30.62 min. Kaabachi O et al[4] in 2007 studied clonidine (1 µg/kg) as adjuvant to bupivacaine and observed that time to recovery of motor block was 252 ±79 min. The results of both studies are comparable.

In our study time to first rescue analgesic was significantly higher in group B 392±34.21 as compared to group A 251±24.04 which is comparable to Kaabachi O et al[4] study.

Adverse reactions like nausea, vomiting, shivering, pruritus and respiratory depression were not present in both groups.

CONCLUSION

In our study of 60 patients we observed that intrathecal clonidine 45µg markedly prolong sensory blockade, motor blockade and duration of postoperative analgesia. With significant hypotension and bradycardia which requires monitoring. I conclude that comparing with NS Clonidine 45µg seems to be attractive, alternative as adjuvant to intrathecal hyperbaric bupivacaine heavy(0.5%) which markedly prolongs duration of sensory and motor blockage, provides excellent quality of postoperative analgesia with minimum hemodynamic changes and adverse reaction.

REFERENCES

1. Sethi BS et al : Efficacy of analgesic effects of low does intrathecal clonidine as adjuvant to bupivacaine. Indian journal of Anesthesia 2007:51 (5) : 415-419.
2. Eisenach JC et al : Alpha 2. Adrenergic agonists for regional anesthesia : A clinical review of clonidine (1984-1995). Anesthesiology. 1996; 85 : 655-674
3. Filos KS, Goudas LC, Patroni O, et al. Hemodynamic and analgesic profile after intrathecal Cloniidine in humans: a dose-response study. Anesthesiology. 1994; 81:591–601
4. Kaabachi O, et al. Cloniidine 1µg/kg is a safe and effective adjuvant to plain bu pivacaine in spinal anesthesia in adolescents Anaesth analg 2007; 105:516-19.
5. Kanazi GE, Aouad MT, Jabbour- Khoury SI, Al Jazzar MD, Alameddine MM, Al-Yaman R, et al. effect of low dose dexmedetomdine or Cloniidine on the characteristics of Bupivacaine spinal block. Acta Anesthesiol Scand 2006;50:222-7.
6. Poonam S Ghodki, Shalini P Sardesai, Evaluation of the effect of intrathecal clonidine to decrease shoulder tip pain in laparoscopy under spinal anaesthesia. Indian Journal of Anesthesia. 2010 ; 54(3): 231-234