Original Research Paper

Volume - 12 | Issue - 02 | February - 2022 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Anaesthesiology

INTRATHECAL CLONIDINE WITH HYPERBARIC BUPIVACAINE AND FENTANYL WITH HYPERBARIC BUPIVACAINE MIXTURE FOR PROLONGATION OF POST OPERATIVE ANALGESIA IN LOWER LIMB AND LOWER ABDOMINAL SURGERIES: AN OBSERVATIONAL ANALYTICAL STUDY

Sunita Shende Associate Professor, GMC Miraj.

Anushree Chaudhari Assistant Professor, GMC Miraj.

Samiksha Kulkarni* Senior Resident, GMC Miraj. *Corresponding Author

Adrishta Senior Resident, GMC Miraj.

ABSTRACT There are many adjuvants used along with bupivacaine for subarachnoid block, but fentanyl and clonidine are commonly used as adjuvant to intrathecal bupivacaine for prolonging both sensory and motor blockade as well as postoperative analgesia in patients undergoing lower limb and lower abdominal surgeries. Both are comparable in terms of onset of sensory and motor blockade. The combination of intrathecal, clonidine or fentanyl as adjuvants to bupivacaine in spinal anaesthesia is equally preferred clinically in terms of duration of onset of sensory blockade; motor blockade, duration of analgesia and hemodynamic stability as compared to bupivacaine alone.

KEYWORDS : Spinal anaesthesia, bupivacaine, clonidine, fentanyl, postoperative analgesia.

INTRODUCTION

Postoperative pain relief helps in early patient mobilization, reduction of respiratory complications, good patient's outcome, decreased morbidity and improved patient's satisfaction[1]. Lower dose of clonidine and fentanyl are safe and prolongs the postoperative analgesia of intrathecal bupivacaine. Intrathecal clonidine is established to increase the effect of subarachnoid block as well as decreased the requirement of local anaesthetic agent.[2]

This study was designed to study intrathecal clonidine with hyperbaric bupivacaine and fentanyl with hyperbaric bupivacaine mixture for prolongation of post operative analgesia in lower limb and lower abdominal surgeries.

AIMS AND OBJECTIVES

The aim is to study the clinical efficacy of intrathecal clonidine with hyperbaric bupivacaine and fentanyl with hyperbaric bupivacaine for prolongation of post operative analgesia in patients undergoing lower limb and lower abdominal surgeries.

The primary objective is to study characteristics of subarachnoid block in terms of prolongation of post operative analgesia in lower limb and lower abdominal surgeries.

MATERIALS AND METHODS

The patients(18years-65years) to be posted for lower limb and lower abdominal surgeries undergoes a detailed history and pre-anaesthetic evaluation is done on the previous day of the surgery. Routine investigations like haemoglobin, blood grouping, serum electrolytes, blood sugar are done.

Written informed consent is taken prior to scheduled operation from the patients.

Inclusion Criteria

1. Patients posted for elective surgeries of lower limb and lower abdominal surgeries and duration lasting for 90minutes to 120minutes.
2. ASA grade I and II.
3. Age group of 18 –65 years of either sex.

Exclusion Criteria

1. Patients on β-blockers, antidepressants, anxiolytics, anticonvulsant or antipsychotics.
2. Any spine related comorbidities like kyphosis, scoliosis, lordosis.
3. Any skin infection at injection site, any coagulopathies.
4. BMI more than 30 kg/m2.
5. Pregnancy.
6. Patients above 65years of age.

Patients are kept nil by mouth 6 hours before surgery. The selection of adjuvant as 50ug inj.clonidine or 25ug inj.fentanyl with 2.5ml of 0.5% hyperbaric inj. bupivacaine is decided by senior anaesthetist.

All patients are monitored with electrocardiography, pulse oximetry and blood pressure. Baseline systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial blood pressure (MAP), heart rate(HR) and oxygen saturation (SpO2) are recorded. Ringer lactate solution is started as maintenance fluid.

The patient is premedicated with Inj Ranitidine (1mg/kg)

Inj Ondansetron (0.1mg/kg)

The onset and duration of sensory and motor block, sedation score, hemodynamic parameters(vitals), total duration of analgesia, and potential adverse effects will be measured. Under all aseptic precautions, subarachnoid block is routinely given in our institute with 25-gauge Quincke needle in siting position in L3-L4 interspace and depending upon the selection of drug by senior anaesthestist, after confirming free and clear flow of CSF, either 25 µg inj. fentanyl or 50 µg inj. clonidine administered with 2.5 ml of 0.5% hyperbaric inj. bupivacaine resulting in total volume of 3 ml will be injected intrathecally by senior anaesthetist for this study.

Group I- Patients who were administered 25 µg inj. fentanyl along with 2.5ml of 0.5% hyperbaric inj. bupivacaine. Group II-Patients who were administered 50 µg inj. clonidine along with 2.5ml of 0.5% hyperbaric inj. bupivacaine.

Vitals like, heart rate and blood pressure is measured for every 5 min. Symptomatic hypotension and bradycardia is treated with inj.mephentermine and inj.atropine, respectively. Pinprick method will be used for the assessment of the sensory blockade. Modified bromage scale will be used to assess the degree of motor blockade.

Observations will be recorded. Any significant adverse effects such as nausea, vomiting, pruritus, shivering, sedation, hypotension, bradycardia, and respiratory discomfort will be documented. The Ramsay Sedation Score will be utilised to determine the degree or amount of sedation and scoring. Residual sensory blockade will be assessed and recorded and its wearing-off or regression time will be documented with the help of two segment sensory regression (sensation to pin-prick gets two dermatomal segments regression). Residual motor blockade will be recorded and its wearing off time will be documented when patient starts to lift legs against gravity. Patients will be monitored for degree of pain with the visual analogue score (VAS). Postoperative rescue analgesia (intramuscular diclofenac 75 mg) will be given when the VAS score would be >5 and the time of injection of first analgesic drug will be noted. This will be taken as duration of analgesia.

Chi square test and Mann Whitney U test is used for statistical analysis.

OBSERVATION AND RESULTS

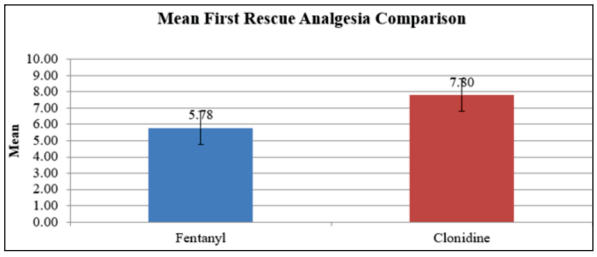
The mean age group, mean height and weight, the gender distribution,

systolic blood pressure, diastolic blood pressure, mean arterial blood pressure, heart rate, side effects, and ASA gradings were comparable between two groups and were not significant. Also, mean onset of motor and sensory block time and mean regression of sensory and motor block were comparable between the two groups.

Mean First Rescue Analgesia Comparison between two groups- Table1

	Group				P Value
	Fentanyl		Clonidine		
	Mean	SD	Mean	SD	
First Rescue Analgesia	5.78	0.42	7.80	.41	< 0.001*

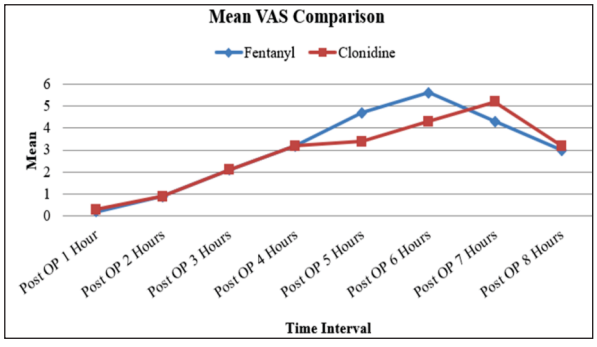
Mean First Rescue Analgesia in Fentanyl group was 5.78 ± 0.42 hrs and in Clonidine group was 7.80 ± 0.41 hrs. There was significant difference in mean First Rescue Analgesia between two groups.



Mean VAS Comparison on between two groups at different intervals of time
Table 2

	Group						P value
	Fentanyl			Clonidine			
	Mean	SD	Median	Mean	SD	Median	
Post OP 1 Hour	0.2	0.4	0.00	0.3	0.4	0.00	0.796
Post OP 2 Hours	0.9	0.5	1.00	0.9	0.5	1.00	0.665
Post OP 3 Hours	2.1	0.8	2.00	2.1	0.8	2.00	0.790
Post OP 4 Hours	3.2	0.9	3.00	3.2	0.9	3.00	0.898
Post OP 5 Hours	4.7	1.1	5.00	3.4	0.5	3.00	<0.001*
Post OP 6 Hours	5.6	0.8	6.00	4.3	0.5	4.00	<0.001*
Post OP 7 Hours	4.3	0.5	4.00	5.2	0.4	5.00	<0.001*
Post OP 8 Hours	3.0	0.9	3.00	3.2	1.0	3.00	0.495

There was significant difference in mean VAS score between two groups at post op 5hrs, 6 hrs and 7 hrs. The mean sedation score was also comparable between the two groups.



DISCUSSION

Spinal anaesthesia is a favourable and preferred alternative, when the surgical location is amenable to spinal blockade, for patients with severe respiratory disease or comorbidity as it avoids potential respiratory consequences of intubation and ventilation. Fentanyl and clonidine are frequently used as additives to intrathecal bupivacaine for prolonging both sensory and motor blockade as well as postoperative analgesia in patients who underwent lower limb and lower abdominal surgeries.

When mean first rescue analgesia was compared between the two groups, group II had prolonged analgesia compared to group I. Mean first rescue analgesia in group I was 346.8 ± 25.2 mins (5.78 ± 0.42 hrs) and in group II was 468±24.6 mins (7.80 ± 0.41 hrs). There was significant difference in mean first rescue analgesia between two groups(p-value<0.05). Both clonidine and fentanyl when utilised in lower amount of dose are safe and prolonged the duration of postoperative analgesia of intrathecal hyperbaric bupivacaine.

A study was conducted by Bharat Choudhary *et al.* to compare clonidine and fentanyl as adjuvant in spinal anaesthesia in terms of duration of sensory and motor blockade and duration of postoperative analgesia and complications. The patients were randomly allocated into two groups of 40 each and were given 2.5 ml of 0.5% hyperbaric bupivacaine with either 50 µg of clonidine or 25 µg of fentanyl intrathecally. Group C - Received hyperbaric bupivacaine (2.5 ml) + 50 µg of clonidine (diluted to 0.5 ml) and injected intrathecally. Group F – Was administered with hyperbaric bupivacaine (2.5 ml) + fentanyl 25 µg (diluted to 0.5 ml) administered intrathecally. Time for first dose of rescue analgesic was delayed in Group C (492.32±17.32 min) compared to Group F (418.80±19.68min) which was statistically significant (P < 0.0001). Duration of sensory block in Group C was 146.17±19.42 min compared to 128.24±18.68 min in Group F which was statistically significant (P < 0.0001).[3] Similar results to my study.

According to a study carried out by Bajwa BS, Singh AP, Rekhi AK to assess comparison of intrathecal clonidine and fentanyl in hyperbaric bupivacaine for intrathecal anaesthesia and postoperative analgesia in patients scheduled for lower abdominal surgeries, duration of analgesia was significantly prolonged in clonidine group (497.20 ± 139.78 min) than in fentanyl group (416.87 ± 105.67), (P < 0.05).[4]

A study was conducted by Routray SS *et al*. showed similar results with present study. Time for first requirement of rescue analgesic was prolonged in clonidine group (510.84 ± 24.10 min) as compared to fentanyl group (434.95 ± 19.16 min) which was statistically significant (P < 0.001).[5]

In our study, the postoperative analgesia was graded according to VAS score. The quality of analgesia was assessed until the first request of analgesia.

In this study a VAS score of > 5 is used to give the rescue analgesia of 75mg inj. Diclofenac iv. In the study there was significant difference in mean VAS score between two groups at post operative 5hrs, 6 hrs and 7 hrs. At these intervals mean VAS score was high in fentanyl group compared to clonidine group. At other intervals there was no evidence of significant difference in mean VAS score amongst two groups.

It was seen that in the fentanyl group the VAS was > 5 at around 5.78 ± 0.42 hrs and in clonidine group it was at around 7.80 ± 0.41 hrs. So at this time the rescue analgesia was given in respective groups. In the present study the VAS was comparable for the first 4 post operative hours. But at 5,6 and 7 post operative hours it was more in fentanyl group, because it had less post operative analgesia as compared to clonidine.

A study conducted by Shende *et al,* showed that mean time for post-operative analgesia was significantly longer in clonidine group than control group (9.6 hours and 3.55 hour respectively) (p-value < 0.01). Where clonidine group received 75 µg inj.clonidine and bupivacaine and control group received only 3ml hyperbaric 0.5% bupivacaine +0.5 ml normal saline. This is similar with my study.[6]

In a study conducted by Suman Kaushik, patients who received intrathecal 50 µg clonidine required significantly longer time than the patients who received intrathecal 25µg fentanyl for first dose of rescue analgesia.[7] This is similar with my study.

According to a study conducted by Singh et al, on intergroup comparison, VAS was significantly of higher value in group A than groups B and C. The trend of increase in VAS was significantly earlier in group A as compared to Groups B and C. No significant difference in VAS scores was observed in between Groups B and C (P < 0.05). Where group A received plain bupivacaine 2.5ml, B received 25 µg inj. fentanyl and C received 30 µg inj. clonidine. [8]

Our study findings were similar to the above mentioned studies.

Limitation Of The Study

The study was done in a single center. So, the results cannot be extrapolated to the entire population.

We studied only ASA I-II patients.

CONCLUSION

This study concluded that addition of 50µg clonidine to intrathecal bupivacaine offers longer duration of postoperative analgesia than 25µg of fentanyl. Both the drugs offer similar surgical conditions and prolongs postoperative analgesia but clonidine offers longer duration than fentanyl, so it is suggested clonidine as better choice with regards to postoperative analgesia in lower limb and lower abdominal surgeries.

REFERENCES

1. Cervero F, Laird JMA. One pain or many pains? A new look at pain mechanisms.NIPS 1991; 6: 268-73.
2. Agarwa, A., R. Lakhotia, S. Longwani, S. Srivastava, A. K. Srivastava, and J. Bogra. "A Comparison of Fentanyl and Clonidine As Adjuvants to Intrathecal Levobupivacaine for Spinal Anaesthesia and Postoperative Analgesia in Patients Undergoing for Lower Limb Surgery". International Journal of Biomedical Research, vol. 9, no. 2, Mar. 2018, pp. 76-80,.
3. Bharat Choudhary, Jagdish Kumar, Mahendra Kumar. Comparison of Intrathecal Clonidine and Fentanyl as Adjuvant to Hyperbaric Bupivacaine in Spinal Anaesthesia for Lower Limb Orthopedic Surgery: An Hospital Based Study. Int J Med Res Prof. 2020 Mar; 6(2):74-77.
4. Bajwa BS, Singh AP, Rekhi AK. Comparison of intrathecal clonidine and fentanyl in hyperbaric bupivacaine for spinal anaesthesia and postoperative analgesia in patients undergoing lower abdominal surgeries. Saudi J Anaesth2017;11:37-40
5. Routray SS, Raut K, Pradhan A, Dash A, Soren M. Comparison of intrathecal clonidine and fentanyl as adjuvant to hyperbaric bupivacaine in subarachnoid block for lower limb orthopedic surgery. Anaesthesia, Essays Res. 2017 Jul;11(3):589.
6. Shende S, Bhargava S, Chakravarty N, Patel N, Dave SP. Comparison of Bupivacaine 0.5% and Bupivacaine + Clonidine Intrathecally for intraoperative and Postoperative analgesia in Lower Limb Orthopaedic Surgeries. Int J Med Res Rev 2014;2(4):328- 332.
7. Kaushik S. Comparative study of using intrathecal clonidine and fentanyl as an adjuvant to hyperbaric bupivacaine (0.5%) in lower abdomen surgeries. International Journal of Research and Review. 2019; 6(8):16-20.
8. Singh G, Aulakh GS, Aulakh NK, et al. Effect of intrathecal clonidine versus fentanyl on bupivacaine spinal block in transurethral resection of prostate surgeries. Anesth Essays Res. 2016;10(1):65-70.