Section: Miscellaneous

Original Research Article

A COMPARATIVE STUDY OF LOW DOSE INTRATHECAL DEXMEDETOMIDINE AND CLONIDINE AS ADJUVANT TO BUPIVACAINE ON CHARACTERISTICS OF SPINAL BLOCK

Chayan Sarkar[1], Moumita Debnath[2]

[1]Assistant Professor, Department of Paediatrics, Agartala Government Medical College, Agartala, Tripura, India
[2]Junior Resident, Department of Biochemistry, Agartala Government Medical College, Agartala, Tripura, India

Received : 05/04/2024
Received in revised form : 17/05/2024
Accepted : 03/06/2024

Keywords: Dexmedetomidine, Clonidine, Bupivacaine, Spinal Block

Corresponding Author:
Dr. Moumita Debnath,
Email: debnathmoumita89@gmail.com

DOI: 10.47009/jamp.2024.6.3.119

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (3); 587-589

Abstract

Background: To evaluate the effect of low dose intrathecal dexmedetomidine and clonidine as adjuvant to bupivacaine on motor, sensory blockade and post operative analgesia. **Materials and Methods:** A total of 60 patients, scheduled for lower abdominal, lower limb and gynaecological procedures were selected to participate in this prospective, randomised double blind study. After injecting the drug time were noted (T0) and the patient were turned to supine position. Following observation were recorded: Duration of sensory block(T5), Duration of motor block (T6), Time for rescue analgesia(T7) were noted, Pain was assessed using the Visual Analogue Score (VAS)(0:no pain, 10:maximum pain). **Result:** The results of outcome variables were suggestive of improved effect of addition of clonidine or dexmedetomidine as adjuvant to 0.5 % Bupivacaine (heavy) on duration of sensory block, duration of motor block, post operative analgesia. **Conclusion:** Increased duration of both motor, sensory block and post operative analgesia in dexmedetomidine group compared to clonidine can be applicable in improving the duration of post operative analgesia in surgical cases.

INTRODUCTION

Subarachnoid blockade with local anaesthetics provides intense analgesia by segmental blockade of central neural axis, but duration is limited (short lasting).

The research project will mainly focus about the additive action of 2 drugs (Clonidine or Dexmedetomidine) when administered intrathecally as adjuvant to 0.5 % Bupivacaine.

In which Dexmedetomidine is a centrally acting selective alpha 2 agonist, Dexmedetomidine has mainly alpha 2b and alpha 2c receptors when given intrathecally.[1]

Clonidine also an alpha2 adrenergic agonist has effect on characteristic of spinal block and duration of post operative analgesia when given intrathecally.[2]

Its successful use and advantage have been reported by various recent publications in the medical literature.

Aims and Objectives

To study the effect of addition of clonidine or dexmedetomidine as adjuvant to 0.5 % Bupivacaine (heavy) on the duration of post operative analgesia and time for rescue analgesia.

Objectives

- Following observation were recorded:
- Duration of motor block
- Duration of sensory block
- Time for rescue analgesia.

MATERIALSANDMETHODS

A total of 60 patients, scheduled for lower abdominal, lower limb and gynaecological procedures and were selected to participate in this prospective, randomised double blind study.

Approval from the institutional ethical committee and written informed consent from patients involved in this research were taken.

They were divided on the basis of computer-generated random number table into two groups as follows:

GROUP 1: That is group BD->n=30

They were administered intrathecally 3 ml of bupivacaine 0.5%(H) plus injection Dexmedetomidine 5 microgram in 0.5ml volume (diluted in normal saline).

GROUP 2: That is group BC ->n=30

ISSN (O): 2687-5365; ISSN (P): 2753-6556

They were administered intrathecally 3 ml of bupivacaine 0.5 %(H) plus injection Clonidine(30 microgram) 0.5 ml volume.

Selection Of Cases

Inclusion Criteria

- American society of Anaesthesiologists (ASA) physical status I/II patients
- Patients aged between 18-60
- Patients with both male and female gender
- Surgeries lasting upto duration 120 minutes

Exclusion Criteria

- Patients not willing to take part in the study
- Patients with obvious contraindication to regional anaesthesia, or sensitivity to study drugs and who were on chronic analgesic therapy
- Patient with major systemic illnesses like diabetics, uncontrolled hypertension, ischaemic heart disease, renal and hepatic derangements and disease of central nervous system and spine.

Anaestehsia Technique

All the patients were premedicated with oral Alprazolam (0.25 mg) and ranitidine (3 mg / kg)the night before surgery.

In the operating room, standard monitors (electrocardiogram, Noninvasive blood pressure and pulse oximeter) will be attached to the patient, and baseline vitals were recorded.

An 18G intravenous line were secured and preloaded with Ringer's lactate 10 mg / kg.

Patient were randomly allocated into 2 groups in a double blinded manner.

Patients and assessing anaesthesiologists were blinded to the test drug

The drugs were administered intrathecally in sitting position in L3-L4 or L4-L5 space with a 23 gauze spinal needle. The study solution, prepared by another researcher who was not involved in the patient care, was injected through the spinal needle over a period of ten seconds with no barbotage.

After injecting the drug time was noted (T0) and the patient was turned to supine position

Following observation were recorded

Duration of sensory block(T5)

Duration of motor block (T6)

Time for rescue analgesia(T7) was noted

Pain was assessed using the Visual Analogue Score (VAS)(0:no pain, 10:maximum pain).

Pulse rate and blood pressure was monitored every 5 minutes intraoperatively and every ten minutes subsequently till 2 segment regression of block.

Hypotension (>20% decrease in systolic blood pressure from baseline) was managed with intravenous fluid (20 ml/ kg) initially and then with mephentermine 3 mg in incremental boluses.

Adverse effects such as nausea, vomiting, sedation, pruritus and urinary retention were recorded.

Intraoperative rescue analgesia was administered with Ketamine intravenously, when required. If pain is not relieved, the patient was given general anaesthesia and excluded from the study.

Postoperatively, rescue analgesia medication with diclofenac sodium (1.5mg/kg) was administered intramuscularly, if VAS was found to be >5.

Dermatomal sensory block up to T10 was considered adequate for surgery. The maximum height of sensory blockade was noted at 20 minutes.

All patients was followed up after surgery, In every 2 hrs interval for post operative analgesia assessment and for any behavioral side effects, like confusion, dizziness, nystagmus, nausea, vomiting or any neurological complications.

Statistical Analysis: Statistical analysis was conducted with EPI info. Descriptive data was presented as mean +/- SDF or all test 'f' value was presented according to f distribution table.

RESULTS

Demographic data comparing age, sex, height, weight shows no statistical difference among the groups.

Duration of sensory, motor blockade and duration of analgesia is significantly prolonged in the dexmedetomidine group compared to the clonidine group.

Table 1: Spinal block characteristics in both groups

Spinal block characteristics	Group BC	Group BD
The time taken for regression of sensory block by two segments	133.83 ± 6.131	134 ± 6.873
Total duration of sensory block	328.83 ±26.577	353.33 ±20.608
Duration of motor blockade	271 ± 18.448	304.66 ±16.344
Time for first rescue analgesia	312 ± 24.992	341 ± 20.327

DISCUSSION

There is a statistically significant prolonged duration of motor, sensory blockade and post operative analgesia in dexmedetomidine group compared to clonidine group which was similar to study conducted by Kanazi GE et al,[3] Al-Mustafa MM et al,[1] Al-Ghanem SM et al,[4] Gupta R et al,[5] Gupta R et al,[6] Eid HEA et al,[7] and Shukla D et al.[8]

CONCLUSION

In the present study the efficacy of intrathecal dexmedetomidine and clonidine were compared and we noticed that intrathecal dexmedetomidine was better than clonidine with regards to duration of both sensory and motor blockade as well as duration for first rescue analgesia. Hence dexmedetomidine is a better neuraxial adjuvant compared to clonidine for providing prolonged post operative analgesia.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

REFERENCES

1. Al-Mustafa MM, Abu-Halaweh SA, Aloweidi AS, Murshidi MM, Ammari BA, Awwad ZM, et al. Effect of dexmedetomidine added to spinal bupivacaine for urological procedures. Saudi medical journal. 2009;30(3):365-70.
2. B.S.Sethi, Mary Samuel, Sreevastava D. Efficacy of Analgesic Effects of Low Dose Intrathecal Clonidine as Adjuvant to Bupivacaine. Indian Journal of Anaesthesia. 2007;51(5):415-9.
3. Kanazi GE, Aouad MT, Jabbour-Khoury SI, Al Jazzar MD, Alameddine MM, Al-Yaman R, et al. Effect of low-dose dexmedetomidine or clonidine on the characteristics of bupivacaine spinal block. Acta Anaesthesiol Scand. 2006;50(2):222-7.
4. Al-Ghanem SM MI, Al-Mustafa MM, Al-Zaben KR, QudaisatI Y, Qatawneh AM ea. Effect of Adding Dexmedetomidine versus Fentanyl to Intrathecal Bupivacaine on Spinal Block Characteristics in Gynecological Procedures: A Double blind Controlled Study. American Journal of AppliedSciences. 2009(6(5)):882-7.
5. Gupta R, Verma R, Bogra J, Kohli M, Raman R, Kushwaha JK. A Comparative study of intrathecal dexmedetomidine and fentanyl as adjuvants to Bupivacaine. Journal of anaesthesiology, clinical pharmacology. 2011;27(3):339-43.
6. Gupta R, Bogra J, Verma R, Kohli M, Kushwaha JK, Kumar S. Dexmedetomidine as an intrathecal adjuvant for postoperative analgesia. Indian J Anaesth. 2011;55(4):347-51.
7. Eid HEA SM, Youssef H. Dose-Related Prolongation of Hyperbaric Bupivacaine Spinal Anesthesia by Dexmedetomidine. Ain Shams Journal ofAnesthesiology. 2011 Jul(4(2)):83-95.
8. Shukla D, Verma A, Agarwal A, Pandey HD, Tyagi C. Comparative study of intrathecal dexmedetomidine with intrathecal magnesium sulfate used as adjuvants to bupivacaine. Journal of anaesthesiology, clinical pharmacology. 2011;27(4):495-9.

ISSN (O): 2687-5365; ISSN (P): 2753-6556