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RESEARCH ARTICLE

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

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Abstract

Background: To evaluate the effect of low dose intrathecal dexmedetomidine and clonidine as adjuvant to bupivacaine on characteristics of spinal block **.** 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 :Onset of time of sensory block(T1) ,Level of sensory block(LMAX), Time to achieve maximum sensory block level(T3), Onset of motor block(T2) , Peak level of motor blockade(T4) were assessed by using Bromage score .

Results: The results of outcome variables were suggestive of improved effect of addition of clonidine or dexmedetomidine as adjuvant to 0.5 % Bupivacaine (heavy) on Quality of blockade

Conclusions: Improved quality of block in dexmedetomidine group compared to clonidine can be applicable in improving the duration of block in surgical cases requiring prolonged block.

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)

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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 Quality of blockade

Objectives:-

Following observation were recorded :
Onset of time of sensory block(T1)
Level of sensory block(LMAX)
Time to achieve maximum sensory block level(T3)
Onset of motor block(T2)
Peak level of motor blockade(T4) will be assessed by using Bromage score .

Materials And Methods:-

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:
1) 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).

2)GROUP 2 : That is group BC ->n=30
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 :
1)American society of Anaesthesiologists (ASA) physical status I/II patients
2)patients aged between 18-60
3)patients with both male and female gender
4)Surgeries lasting upto duration 120 minutes

Exclusion Criteria
1)patients not willing to take part in the study
2)patients with obvious contraindication to regional anaesthesia ,or sensitivity to study drugs and who were on chronic analgesic therapy
3)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 :
Onset of time of sensory block(T1)

Level of sensory block(LMAX)

Time to achieve maximum sensory block level(T3)

Onset of motor block(T2)

Peak level of motor blockade(T4) will be assessed by using Bromage score .

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 +/- SD

For 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.

In our study the mean time taken for onset of sensory block is 1.67±0.547 mins in the clonidine group and 1.27 ± 0.449 mins in the dexmedetomidine group .

The mean time taken for maximum sensory blockade in the present study is 5.9 ± 0.803 mins in the clonidine group and 5.2 ± 0.714 mins in dexmedetomidine group.

In our study the maximum level of sensory blockade achieved is T4. 20 out of 30 patients in clonidine group and 16 out of 30 patients in dexmedetomidine group had T4 level of sensory blockade.

There is no statistical significant difference in the maximum level of sensory blockade in the clonidine group and dexmedetomidine group .

Spinal block characteristics	Group BC	Group BD
Time taken for surgical anaesthesia at level T10	1.67± 0.547	1.27 ± 0.449
Time taken for maximum sensory blockade	5.9 ± 0.803	5.2 ± 0.714

Discussion:-

There is a statistically significant decrease in the onset of sensory blockade in clonidine group and in the dexmedetomidine group which was similar to study conducted by Saxena H et al.(3)

There is a statistically significant decrease in the mean time taken for the maximum sensory blockade in the clonidine group and dexmedetomidine group compared to the control group which is similar to study conducted by Saxena H et al.(3)

There is no statistical significant difference in the maximum level of sensory blockade in the clonidine group and dexmedetomidine group which is similar to studies conducted by Kanazi GE et al (4) and Al-Ghanem SM et al (5).

Conclusion:-

From the present study it can be concluded that intrathecal dexmedetomidine in the dose of 5µg or intrathecal clonidine in the dose of 50 µg along with 3 ml bupivacaine, 0.5% heavy, in patients undergoing elective lower abdominal,lower limb and gynaecological surgeries,

- Decreases the onset time for sensory blockade
- Decreases the onset time for motor blockade

In the present study the efficacy of intrathecal dexmedetomidine andclonidine were compared and we noticed that intrathecal dexmedetomidine was better than clonidine with regards to onset .

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