

Original Research

Evaluation of effectiveness of two different Doses of Clonidine as an Additive to Intrathecal Isobaric Levobupivacaine in Patients Undergoing Infraumbilical Surgeries: A comparative study

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Received date: 8 January, 2024

Acceptance date: 6 February, 2024

Abstract

Background: To compare two different doses of clonidine as an additive to intrathecal isobaric levobupivacaine in Patients Undergoing Infraumbilical Surgeries.

Materials & methods: 100 patients within the age range of 25 to 60 years were enrolled. Complete demographic and clinical details of all the patients was obtained. Inclusion criteria included patients of ASA grade I/II and schedule to undergo elective infraumbilical surgeries under spinal anesthesia. A total of two study groups were formed with 50 patients in each group as follows: Group A: Levobupivacaine 0.5% isobaric (3 mL) with clonidine 15 µg, & Group B: Levobupivacaine 0.5% isobaric (3 mL) with clonidine 30 µg. Patients receiving rescue analgesia who have a VAS score greater than 3. Hemodynamic variables were continuously monitored both during and after surgery. Every outcome was entered into a Microsoft Excel spreadsheet, and then SPSS software was used for statistical analysis.

Results: Mean age of subjects of group A was 43.5 years and of subjects of group B was 41.9 years. Majority proportion of patients of both the study groups were males. Mean time of onset of sensory block among patients of group A and group B was 6.75 minutes and 3.12 minutes respectively; on comparing, significant results were obtained. Significant results were obtained while comparing the time for maximum sensory blockage and duration of analgesia among the two study groups.

Conclusion: The addition of 30 µg of clonidine as an adjuvant could safely prolong the duration of postoperative analgesia in comparison to 15µg of clonidine.

Key words: Isobaric Levobupivacaine, Clonidine

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Introduction

The development of regional anesthesia started with the isolation of local anesthetics, the first being cocaine (the only naturally occurring local anesthetic). Other neuraxial techniques include epidural and caudal anesthesia, each having its particular indications. Spinal anesthesia is only performed in the lumbar spine and is used for surgical procedures involving the lower abdomen, pelvis, and lower extremities.^{1- 3}A spinal anesthetic is used for orthopedic surgery on joints or bones of the leg and is also commonly used for any

surgery below the umbilicus like groin hernia repair, hemorrhoid surgery, hysterectomy, cesarean section, prostate surgery, genital surgery. Spinal anesthesia has indicated for surgery below the umbilicus but it has contraindication which ranges from absolute to relative. Patient refusal, infection at the site of injection, a true allergy to local anesthetic drugs, coagulopathy, and increased intracranial pressure are absolute while neurological disease, fixed cardiac output states, uncooperative, and aortic stenosis are the relative contraindications.^{4- 6}Clonidine and dexmedetomidine

are centrally acting α_2 adrenoceptor agonists used as adjuvants to local anesthetics because of their sedative, analgesic, and hemodynamic stabilizing effect. They have been found to prolong the duration of spinal or sub-arachnoid block following intrathecal administration. Clonidine is an imidazoline compound, an alpha-adrenergic agonist with selectivity for α_2 receptors. Studies suggest that clonidine produces analgesia by depressing the release of C-fiber transmitters and hyperpolarization of postsynaptic dorsal horn neurons.⁷⁻⁹ Hence; the present study was conducted for comparing different doses of clonidine as an additive to intrathecal isobaric levobupivacaine in Patients Undergoing Infraumbilical Surgeries.

Materials & methods

100 patients within the age range of 25 to 60 years were enrolled. Complete demographic and clinical details of all the patients was obtained. Inclusion criteria included patients of ASA grade I/II and schedule to undergo elective infraumbilical surgeries under spinal anesthesia. A total of two study groups were formed with 50 patients in each group as follows: Group A: Levobupivacaine 0.5% isobaric (3 mL) with clonidine

15 μg , & Group B: Levobupivacaine 0.5% isobaric (3 mL) with clonidine 30 μg . Baseline hemodynamic and biochemical profile assessments were conducted on blood samples. The Visual Analog Scale (VAS) was employed for postoperative evaluation. On a pain scale of 0 to 10, where 0 represents no pain and 10 represents the highest level of intolerable agony. Patients receiving rescue analgesia who have a VAS score greater than 3. Hemodynamic variables were continuously monitored both during and after surgery. Every outcome was entered into a Microsoft Excel spreadsheet, and then SPSS software was used for statistical analysis.

Results

Mean age of subjects of group A was 43.5 years and of subjects of group B was 41.9 years. Majority proportion of patients of both the study groups were males. Mean time of onset of sensory block among patients of group A and group B was 6.75 minutes and 3.12 minutes respectively; on comparing, significant results were obtained. Significant results were obtained while comparing the time for maximum sensory blockage and duration of analgesia among the two study groups.

Table 1: Time of onset of sensory and motor block (mins)

Time of onset	Group A	Group B	p-value
Sensory block	6.75	3.12	0.000 (Significant)
Motor block	3.96	3.35	0.228

Table 2: Time for maximum sensory blockage

Time for maximum sensory blockage	Group A	Group B
Mean	12.23	9.12
p-value	0.001 (Significant)	

Table 3: Duration of analgesia (mins)

Duration of analgesia	Group A	Group B
Mean	256.2	311.3
p-value	0.000 (Significant)	

Discussion

Spinal anesthesia is easy to perform, it is inexpensive, has less effect on the cardiovascular system than general anesthesia, has a minimal impact on the respiratory system. The use of spinal anesthesia avoids the possibility of difficult airway establishment. All these benefits of spinal anesthesia lead to the possibility of day surgery for patients who have had certain risks and contraindications for general anesthesia, such as the elderly, the overweight, or those with comorbidities.⁷⁻⁹ With the discovery of new short-acting local anesthetics, spinal anesthesia has a rapid onset of action, rapid cessation of action with rapid recovery of motor function, adequate analgesia (better than with general anesthesia) with minimal side effects, making it

an ideal anesthesia for day surgery.¹⁰ Other benefits of spinal anesthesia include a lower incidence of postoperative nausea and vomiting, the possibility of early oral hydration and food intake, which is especially important in diabetics, as well as the possibility of intraoperative or early postoperative communication with the surgeon. Spinal anesthesia can also be opioid-free anesthesia.¹¹⁻¹³ Hence; the present study was conducted for comparing different doses of clonidine as an additive to intrathecal isobaric levobupivacaine in Patients Undergoing Infraumbilical Surgeries. Mean age of subjects of group A was 43.5 years and of subjects of group B was 41.9 years. Majority proportion of patients of both the study groups were males. Mean time of onset of sensory block among patients of group

A and group B was 6.75 minutes and 3.12 minutes respectively; on comparing, significant results were obtained. Significant results were obtained while comparing the time for maximum sensory blockage and duration of analgesia among the two study groups. Krishna K et al, in a previous study assessed seventy-five patients posted for elective lower-limb orthopedic surgeries and randomly divided them into three groups with 25 patients in each group as L (levobupivacaine 0.5%), LC-15 (levobupivacaine 0.5% + clonidine 15 µg), and LC-30 (levobupivacaine 0.5% + clonidine 30 µg). All the patients were given spinal anesthesia using the study drugs, and various parameters were monitored. There was a statistically significant difference among the three groups with respect to the onset of time for maximum sensory blockade and duration of analgesia. A statistically significant difference was noted among the three groups with respect to the onset of time for maximum motor blockade. Both doses of clonidine produced prolonged sensory block compared to the control.⁵ Agarwal D et al assessed patients and divided them into two study groups; Group C received 9 mg hyperbaric bupivacaine without clonidine while Group C15 and Group C30 received 15 µg and 30 µg clonidine with hyperbaric bupivacaine respectively for spinal anesthesia. Effect of clonidine on sensory block levels was the primary study outcome measure. Motor blockade and hemodynamic parameters were also studied. A significantly higher median block levels were achieved in Group C15 ($P < 0.001$) and Group C30 ($P = 0.015$) than Group C. Highest median sensory block level, the mean times for sensory regression to T12 level and motor block regression were statistically significant between Groups C15 and C and between Groups C30 and C. On comparison of fall in systolic blood pressure trends, there was no significant difference in the clonidine groups as compared with the control group. In elderly patients, clonidine when used intrathecally in doses of 15 µg or 30 µg with bupivacaine, significantly potentiated the sensory block levels and duration of analgesia without affecting the trend of systolic blood pressure as compared to bupivacaine alone.¹⁴ Singh RB et al, assessed the safety of intrathecal clonidine as adjuvant to bupivacaine. Hundred patients were randomly allocated in two groups, A and B. Group A received bupivacaine 0.5%, 3 ml with placebo (normal saline 0.33 ml) and Group B, bupivacaine 0.5%, 3 ml with clonidine 50 µg (0.33 ml). Mean duration of motor block was significantly higher in Group B (280.80 ± 66.88 min) as compared with Group A (183.60 ± 77.06 min). Significant difference in duration of sensory block was noted between Group B (295.20 ± 81.17 min) and Group A (190.80 ± 86.94 min). Duration of postoperative analgesia was significantly higher in Group B as compared to Group A (551.06 ± 133.64 min

and 254.80 ± 84.19 min respectively). Mean visual analog scale scores at different time intervals were significantly lower in the study group (except for 4-h time interval), but the control group had better hemodynamic stability as compared with study group. The findings in their study suggested that use of clonidine 50 µg added to bupivacaine for spinal anesthesia effectively increased the duration of sensory block, duration of motor block, and duration of analgesia.¹⁵

Conclusion

In comparison to 15 µg, the addition of 30 µg of clonidine as an adjuvant could safely prolong the duration of postoperative analgesia.

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