

Comparison of 0.5% Levobupivacaine Versus 0.5% Isobaric Levobupivacaine with 3mcg Dexmedetomidine in Spinal Anaesthesia- A Comparative Study

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Abstract

Background: Effective postoperative pain control is an essential component of the care of the surgical patient. The present study was conducted to compare levobupivacaine 0.5% versus isobaric levobupivacaine 0.5% with 3mcg dexmedetomidine in spinal anaesthesia. **Subjects and Methods:** The present study was conducted on 80 patients of ASA Grade-I and Grade-II of both genders. They were divided into 2 groups of 40 each. Group I were those who received 3 ml of 0.5% isobaric levobupivacaine with 0.3 ml of normal saline and group II patients received 3 ml of 0.5% isobaric levobupivacaine with 3µg of dexmedetomidine. Parameters such as onset of sensory blockade at T10 dermatome and onset of motor blockade motor blockade, maximum level of sensory and motor blockade attained and the time taken for the same, total duration of sensory blockade and motor blockade were recorded. **Results:** Group I, ASA grade I was seen in 25 and II in 15, in group II, ASA grade I was seen in 22 and II in 18 patients. Group I comprised of 18 males and 22 females, group II had 20 males and 20 females. Mean duration of surgery in group I was 58.2 minutes in group I and 56.4 minutes in group II. Mean heart rate was 82.3 per minute in group I and 81.6 per minute in group II. The mean time required to obtained sensory block in group I was 10.4 minutes and in group II was 7.4 minutes. The mean time for motor block in group I was 8.2 minutes and in group II was 5.4 minutes. The mean time required to obtain motor block in group I was 16.5 minutes and in group II was 16.1 minutes. **Conclusion:** Authors found that addition of intrathecal dexmedetomidine to 0.5% isobaric levobupivacaine shortens sensory and motor block onset time and prolongs block duration.

Keywords: Dexmedetomidine, Levobupivacaine, Sensory Block.

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Introduction

Anesthesiologist is looking after preoperative and intraoperative care of the patients and he/she is also responsible for the postoperative pain relief.^[1] Effective postoperative pain control is an essential component of the care of the surgical patient. Inadequate pain control may result in increased morbidity or mortality. With the growing world, there is great interest in the use of regional anesthesia techniques for a number of common surgeries replacing the general anesthesia.^[2]

Till recently hyperbaric bupivacaine 0.5% was the only drug used for spinal anaesthesia after the discontinuation of lidocaine's intrathecal use.^[2] Bupivacaine is available as a racemic mixture of its enantiomers, dextrobupivacaine and levobupivacaine. It has been found that dextro enantiomer is the cause for cardiotoxicity and the levobupivacaine the pure S (-) enantiomer does not have the cardiotoxicity. Levobupivacaine has similar pharmacodynamic properties of racemic bupivacaine but a documented reduced central nervous system and cardiovascular toxicity.^[4]

Opioids and α 2-receptor agonists are important as neuraxial

adjuvants not only to improve the quality of perioperative analgesia but also to minimize the local anesthetic dose, particularly in high-risk patients and in ambulatory procedures.^[5] Dexmedetomidine is a α 2-adrenoceptor agonist that is approved as an intravenous sedative and coanalgesic drug. Its use is often associated with a decrease in heart rate and blood pressure.^[6] It has been proved that 5 µg dexmedetomidine is associated with prolonged motor and sensory block, hemodynamic stability and reduced demand for rescue analgesics when added to 12.5mg of hyperbaric bupivacaine in patients undergoing lower abdominal surgeries.^[7] The present study was conducted to compare levobupivacaine 0.5% versus isobaric levobupivacaine 0.5% with 3mcg dexmedetomidine in spinal anaesthesia.

Subjects and Methods

The present study was conducted on 80 patients of ASA Grade-I and Grade-II of both genders admitted to the department of Anesthesiology for elective lower limb surgeries. Approval for the study was obtained from institutional ethical committee. All patients were informed regarding the study and written consent was obtained.

Data such as name age, gender etc. was recorded. They were divided into 2 groups of 40 each. Group I were those who received 3 ml of 0.5% isobaric levobupivacaine with 0.3 ml of normal saline and group II patients received 3 ml of 0.5% isobaric levobupivacaine with 3µg of dexmedetomidine. Parameters such as onset of sensory blockade at T10 dermatome and onset of motor blockade motor blockade, maximum level of sensory and motor blockade attained and the time taken for the same, total duration of sensory blockade and motor blockade were recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant (p< 0.05).

Results

Table 1: Distribution of patients

Groups	Group I	Group II
Agent	3 ml of 0.5% isobaric levobupivacaine with 0.3 ml of normal saline	3 ml of 0.5% isobaric levobupivacaine with 3µg of dexmedetomidine
Number	40	40

[Table 1] shows distribution of patients based on agent used in both groups. Each group had 40 patients.

Table 2: Comparison of parameters

Variables	Group I	Group II	P value
ASA grade			
Grade I	25	22	0.12
Grade II	15	18	
Gender			
Male	18	20	0.14
Female	22	20	
Duration of surgery	58.2	56.4	0.82
Heart beat/ mins	82.3	81.6	0.91

[Table 2] shows in group I, ASA grade I was seen in 25 and II in 15, in group II, ASA grade I was seen in 22 and II in 18 patients. Group I comprised of 18 males and 22 females, group II had 20 males and 20 females. Mean duration of surgery in group I was 58.2 minutes in group I and 56.4 minutes in group II. Mean heart rate was 82.3 per minute in group I and 81.6 per minute in group II. The difference was significant (P< 0.05).

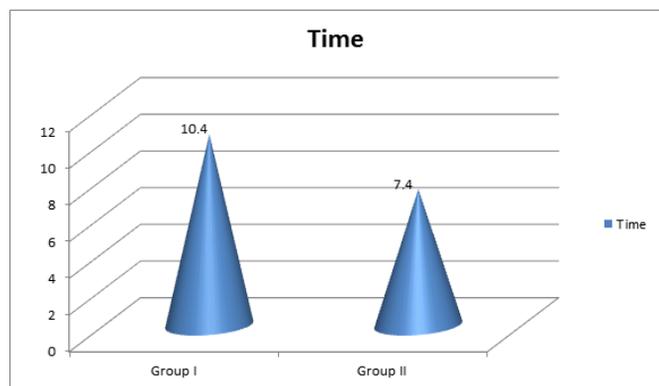


Figure 1: Time for maximum sensory block

[Figure 1] shows that mean time required to obtained sensory block in group I was 10.4 minutes and in group II was 7.4 minutes. The difference was significant (P< 0.05).

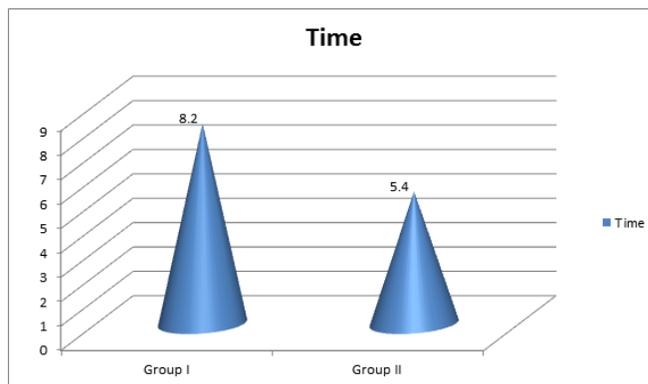


Figure 2: Time for onset of motor block

[Figure 2] shows that mean time for motor block in group I was 8.2 minutes and in group II was 5.4 minutes. The difference was significant (P< 0.05).

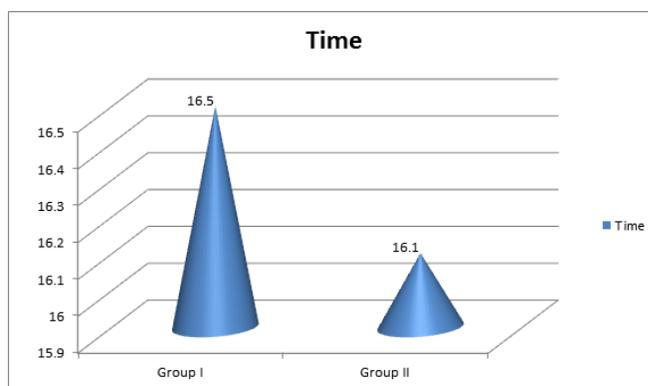


Figure 3: Time for maximum motor block

[Figure 3] shows that mean time required to obtained motor block in group I was 16.5 minutes and in group II was 16.1 minutes. The difference was non-significant (P> 0.05).

Discussion

Regional anesthesia has many benefits over general anesthesia as it eliminates the pain both intraoperatively and postoperatively, provides excellent muscle relaxation, and reduces intraoperative bleeding. Regional anesthesia techniques are also superior to systemic opioid agents with regard to analgesia profile and adverse effects.^[8] Spinal anesthesia is the most commonly used technique due to its unmatched reliability, simplicity, and cost effectiveness. It provides a fast and effective onset of sensory and motor block, excellent muscle relaxation, and prolonged postoperative analgesia.^[9] Due to decreased cardiovascular and central nervous system toxicity, levobupivacaine is a good alternative.^[10] The present study was conducted to compare levobupivacaine 0.5% versus isobaric levobupivacaine 0.5% with 3mcg dexmedetomidine in spinal anaesthesia.

In present study, group I were those who received 3 ml of 0.5% isobaric levobupivacaine with 0.3 ml of normal saline and group II patients received 3 ml of 0.5% isobaric levobupivacaine with 3µg of dexmedetomidine. They were divided into 2 groups of 40 each.

We found that in group I, ASA grade I was seen in 25 and II in 15, in group II, ASA grade I was seen in 22 and II in 18

patients. Group I comprised of 18 males and 22 females, group II had 20 males and 20 females. Mean duration of surgery in group I was 58.2 minutes in group I and 56.4 minutes in group II. Mean heart rate was 82.3 per minute in group I and 81.6 per minute in group II. Hala EA Eid et al,^[11] found significant prolongation of the duration of spinal blockade by intrathecal administration of dexmedetomidine as an adjunct to hyperbaric bupivacaine. Patients in the groups that received dexmedetomidine had reduced postoperative pain scores and a longer analgesic duration than those who received spinal bupivacaine alone. This effect appears to be dose dependent and more pronounced with the dose of 15 µg. Fifteen µg dexmedetomidine but not 10 µg was associated with lower 24-hours analgesic requirements and desirable level of sedation.

We found that mean time required to obtained sensory block in group I was 10.4 minutes and in group II was 7.4 minutes. The mean time for motor block in group I was 8.2 minutes and in group II was 5.4 minutes. The mean time required to obtain motor block in group I was 16.5 minutes and in group II was 16.1 minutes.

Kataria et al,^[12] had 60 adult patients between the age group of 20 and 65 years of physical status ASA grade I and II who underwent infraumbilical surgeries. Group L patients received 3 ml (15 mg) of 0.5% isobaric levobupivacaine + 0.3 ml normal saline while Group LD patients received 3 ml (15 mg) of 0.5% isobaric levobupivacaine + 0.3 ml (3 µg) dexmedetomidine. The two groups were compared with respect to the onset and duration of sensory and motor block and hemodynamic stability. Results: The mean duration of sensory block in Group L was 199.50 ± 7.96 min while in Group LD was 340.20 ± 11.78 min. All the differences were statistically highly significant between the two groups. Mean duration of motor block in Group L and LD was 150.83 ± 9.17 min and 190.20 ± 9.61 min, respectively. Both the differences were highly significant.

Conclusion

Authors found that addition of intrathecal dexmedetomidine

to 0.5% isobaric levobupivacaine shortens sensory and motor block onset time and prolongs block duration.

References

- Sanford M, Keating GM. Levobupivacaine: a review of its use in regional anaesthesia and pain management. *Drugs*. 2010; 70(6):761-91.
- Bajwa SJS, Kaur J. Clinical profile of levobupivacaine in regional anesthesia: A systematic review. *J Anaesthesiol. Clin. Pharmacol*. 2013; 29(4):530-9.
- Burm AG, van der Meer AD, van Kleef JW, Zeijlmans PW, Groen K. Pharmacokinetics of the enantiomers of bupivacaine following intravenous administration of the racemate. *Br. J Clin. Pharmacol*. 1994; 38(2):125-9.
- Esmoğlu A, Türk S, Bayram A, Akin A, Uğur F, Ulgey A. The effects of dexmedetomidine added to spinal levobupivacaine for transurethral endoscopic surgery. *Balkan Med J*. 2013; 30(2):186-190.
- Eid HEA, Shafie MA, Youssef H. Dose-Related Prolongation of Hyperbaric Bupivacaine Spinal Anesthesia by Dexmedetomidine. *Ain Shams Journal of Anesthesiology*. 2011; 4(2):83-95.
- Kaur S, Attri JP, Kaur G, Singh TP. Comparative evaluation of ropivacaine versus dexmedetomidine and ropivacaine in epidural anesthesia in lower limb orthopedic surgeries. *Saudi J Anaesth*. 2014;8:463-9.
- Esmoğlu A, Türk S, Bayram A, Akin A, Uğur F, Ulgey A, et al. The effects of dexmedetomidine added to spinal levobupivacaine for transurethral endoscopic surgery. *Balkan Med J*. 2013;30:186-90.
- Basuni AS, Ezz HA. Dexmedetomidine as supplement to low-dose levobupivacaine spinal anesthesia for knee arthroscopy. *Egypt J Anaesth*. 2014;30:149-53.
- 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;50:222-7.
- Deori AK, Das A, Borgohain D, Bora D, Saikia A, Tiwari PK, et al. A comparative study of spinal anaesthesia with levobupivacaine and hyperbaric bupivacaine for cesarean sections. *IJCMR* 2016;3:1902-5
- Eid HEA, Shafie MA, Youssef H. Dose-Related Prolongation of Hyperbaric Bupivacaine Spinal Anesthesia by Dexmedetomidine. *Ain Shams Journal of Anesthesiology*. 2011; 4(2):83-95.
- Kataria AP, Jarewal V, Kumar R, Kashyap A. Comparison of levobupivacaine and levobupivacaine with dexmedetomidine in infraumbilical surgeries under spinal anesthesia. *Anesth Essays Res* 2018;12:251-5.

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