Original Article

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Efficacy of Hyperbaric Bupivacaine and Clonidine Combination Used as Unilateral Versus Bilateral Spinal Anesthesia During Unilateral Inguinal Hernia Surgery

Takeshi Handa, Tin Suki, Manish Lodha

Department of Anesthesiology and Critical Care, Chitwan Medical College, Bharatpur, Nepal.

Abstract

Background: The lump in the groin of patients with Inguinal hernias goes away with the application of slight pressure or by making the patient lie down. This study compared the efficacy of hyperbaric bupivacaine with clonidine in unilateral versus bilateral spinal anaesthesia during unilateral inguinal hernia surgery. **Subjects and Methods**: The study was conducted in Chitwan Medical College from September 2019 to February 2020 including 50 patients aged 25-60, ASA grade of I -II and undertaking elective hernioplasty. Patients were randomized into the following groups: Group A received unilateral Inj. Bupivacaine 0.5% heavy 12.5mg + Inj. Clonidine 15mg in the sub-arachnoid block; Group B received bilateral Inj. Bupivacaine 0.5% heavy 12.5mg + Inj. Clonidine 15mg in the subarachnoid block. Variation in the motor block, duration of sensory, hemodynamic parameters, onset, and peak level were noted. **Results:** The mean 'onset of sensory block' in group A and group B was 1.52 minutes and 1.27 minutes, respectively. The 'duration of sensory block' was 237.1 minutes in group A and 218.4 minutes in group B. The 'time to achieve peak' was 8.32 minutes in group A and 8.12 minutes in group B. The 'time to onset of motor block' was 1.45 minutes and 1.72 minutes in group A and group B, respectively. However, 'the duration of motor block' was significantly higher in group A (210.5 minutes) than group B (198.1 minutes) ($P< 0.05$). A significantly higher mean arterial pressure was found in group A than group B ($P< 0.05$), which was recorded 1, 5, 15, 60, 90, and 120 minutes pre-operatively. **Conclusion:** Unilateral spinal anaesthesia achieves stable hemodynamics, adequate duration of the block for surgery, and rapid recovery compared to bilateral spinal anaesthesia.

Keywords: Spinal anesthesia, Motor Block, Sensory Block

Corresponding Author: Takeshi Handa, Department of Anesthesiology and Critical Care, Chitwan Medical College, Bharatpur, Nepal.
E-mail: handa.1972@gmail.com

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Introduction

Inguinal hernias lead to a groin lump, which goes with applying some pressure or making the patient lie down.[1] Patient complains mildly to moderate level of discomfort, which can raise with increased physical activity. About one-third of patients who undertake surgery report no pain with instances of severe pain being rare (1.5% at rest; 10.2% on movement).[2] Inguinal hernias possess a high risk of irreducibility or confinement, resulting in obstruction and rarely strangulation. Data from England noted that in 1998-99, 5% of primary inguinal hernia repairs were treated as an emergency. Risk factors that can lead to acute complications include old age, extended hernia duration and irreducibility.[3]

Unilateral spinal anaesthesia limits the nerve block exclusively to the surgery site, so essential factors affecting successful unilateral sub-arachnoid block include-baricity and volume of drug, the position of the patient, needle type and its bevel direction and injection speed.[4] Unilateral spinal anaesthesia provides a tougher block on the body's side of surgery and accelerates the nerve block recovery. There is a decreased occurrence of hypotension and improved care to ensure cardiovascular stability. Hence it can be a valuable technique for high-risk patients.[5]

This study compares the efficacy of hyperbaric bupivacaine and clonidine combination in unilateral versus bilateral spinal anaesthesia during unilateral inguinal hernia surgery.

Subjects and Methods

The study was conducted in Chitwan Medical College from September 2019 to February 2020 including 50 patients aged between 25-60, ASA grade I -II, undertaking elective hernioplasty. Written informed consent was taken from all

patients and the study design was approved by the institutional ethical committee.

Patient's demographic information was recorded, and they were randomly divided into two groups: Group A received unilateral Inj. Bupivacaine 0.5% heavy 12.5mg + Inj. Clonidine 15mg in the sub-arachnoid block; Group B received bilateral Inj. Bupivacaine 0.5% heavy 12.5mg + Inj. Clonidine 15mg in the subarachnoid block. Patients in group A were kept in lateral position for 10 minutes whereas those in group B were kept in supine position immediately on the OT table. Variations in hemodynamic parameters, onset and peak level, and sensory and motor block duration were noted. Results were analyzed using SPSS and a P-value of less than 0.05 was considered as statistically significant.

Results

Table 1: Bifurcation of patients into groups

Groups	Group A (Unilateral)	Group B (Bilateral)
Number	25	25

[Table 1] shows that group A received unilateral, and group B received bilateral inj Bupivacaine 0.5% heavy 12.5mg + inj Clonidine 15 microgram in the subarachnoid block. Each group had 25 patients.

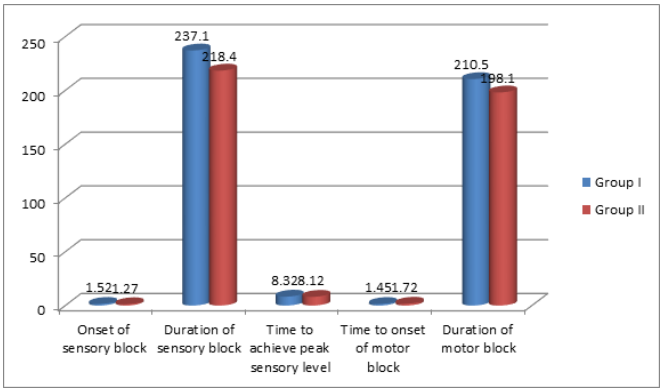

Figure 1: Comparison of parameters

As presented in [Table 2 and Figure 1], the mean 'onset of sensory block' in group A and group B was 1.52 minutes and 1.27 minutes, respectively. The 'duration of sensory block' was 237.1 minutes in group A and 218.4 minutes in group B. The 'time to achieve peak' was 8.32 minutes in group A and 8.12 minutes in group B. The 'time to onset of motor block' was 1.45 minutes and 1.72 minutes in group A and group B, respectively. The observed differences were comparable.

Table 2: Evaluation of parameters

Parameters (minutes)	Group A	Group B	P-value
The onset of sensory block	1.52	1.27	0.12
Duration of sensory block	237.1	218.4	0.05
Time to achieve peak sensory level	8.32	8.12	0.62
Time to onset of motor block	1.45	1.72	0.73
Duration of motor block	210.5	198.1	0.19

However, 'the duration of motor block' was significantly higher in group A (210.5 minutes) than group B (198.1 minutes) (P< 0.05).

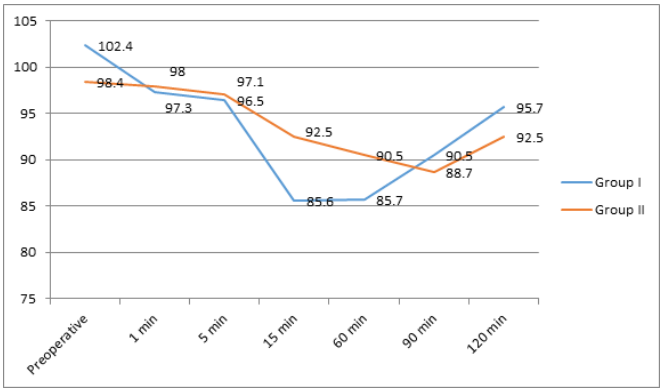

Figure 2: Comparison of mean arterial blood pressure in both groups

[Figure 2] shows a significantly higher mean arterial pressure was found in group A than group B (P< 0.05), which was recorded 1, 5, 15, 60, 90, and 120 minutes pre-operatively.

Discussion

A hernia is classified as reducible if it can be replaced into the abdominal cavity by the application of some pressure, and is considered irreducible if it cannot be pushed back.[6] The diagnosis of reducible hernia can be made clinically based on the detection of signs and symptoms. This longstanding condition can either be unilateral or bilateral with a possibility of reoccurrence after treatment (recurrent hernia).[7]

Inguinal hernias are classified as direct or indirect depending primarily on the location of the hernia sac. In a direct

hernia, the sac directly bulges through the inguinal canal's posterior wall. However, in an indirect hernia, the sac may pass through the internal inguinal ring alongside the spermatic cord, following the inguinal canal's coursing. [8]

Faruk Cicekci et al. found no difference between the groups' blood pressure when they compared unilateral and bilateral spinal anaesthesia by limiting the nerve block to the body's area of surgery in unilateral inguinal hernia patients. [9] They selected forty patients aged between 18-65 belonging to ASA grade I-II and divided them into two groups. All patients were administered 0.5% hyperbaric bupivacaine 15mg and 0.1mg morphine. Unilateral group patients were kept in lateral decubitus position for 10 minutes, whereas bilateral group patients were kept immediately in the supine position. The pre and post-operative systolic blood pressure, diastolic blood pressure, heart rate, and peripheral oxygen saturation were found to be comparable in both groups. However, they observed a significantly higher mean arterial pressure in group A than group B ($P< 0.05$) which was recorded preoperatively at 1, 5, 15, 60, 90, and 120 minutes. Singh et al. reported a faster onset of sensory block in the unilateral group. [10] They observed that the time to reach L1, T12, and T10 dermatome sensory block in the unilateral group was 2 ± 1.17 minutes, 3.34 ± 1.54 minutes, and 4.76 ± 2.11 minutes, respectively. Whereas the same in the bilateral group was 4.19 ± 1.54 minutes, 5.98 ± 2.04 minutes, and 8.06 ± 3.3 minutes, respectively.They concluded this difference to be statistically significant ($P< 0.05$).

Conclusion

Unilateral spinal anaesthesia achieves stable hemodynamics, adequate duration of the block for surgery and rapid recovery compared to bilateral.

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