E-ISSN: 2616-3470
P-ISSN: 2616-3462

www.surgeryscience.com
2019; 3(1): 364-367
Received: 08-11-2018
Accepted: 13-12-2018

Sushil Chhabra
Assistant Professor, Department of Critical Care Medicine and Anesthesia, National Institute of medical science and research Jaipur Rajasthan, India

Alok Chhabra
Assistant Professor, Department of General Surgery, National Institute of Medical Science and Research, Jaipur, Rajasthan, India

Correspondence
Alok Chhabra
Assistant Professor, Department of General Surgery, National Institute of Medical Science and Research, Jaipur, Rajasthan, India

Combined spinal-epidural versus spinal anesthesia comparison of efficacy in terms of analgesia and motor and sensory blockade for lower limb Surgery

Sushil Chhabra and Alok Chhabra

DOI: https://doi.org/10.33545/surgery.2019.v3.i1f.871

Abstract
Introduction: This study was conducted for the better understanding between Of efficacy in terms of motor and sensory blockade and prolonged time of analgesia between spinal and combined spinal epidural methods of anaesthesia.
Methods: This prospective study was conducted on 80 adult patients of both sex belonging to ASA grade I and II,
Results: in our current study we observed that the total time taken by patient for there sensory block, in group 1 patient take about 2.95 min and in group 2.25 min in sensory block in case of motor block group I 12 (30%) patients attained Bromage grade 3 and in group II 10 (25%) patient attained Bromage grade 3. In group I, 28 (70%) patients attained Bromage grade 4, and in group II 30 (75%) patients attained Bromage grade 4.

Keywords: Anaesthetic, anesthetic techniques, regional, combined spinal-epidural, spinal, motor, sensory, analgesia

Introduction

The use of combined spinal epidural anesthesia for elective caesarean section was first described by Brownridge in 1981. It has become popular for anesthesia for caesarean section, because the epidural component allows modification of the spinal block following insertion. The combined technique can be performed as either a through needle or can be separate needle technique. The separate needle technique can be used in subarachnoid block, with epidural catheter placement through a different needle. The needles may be placed at a single or in a separate vertebral interspaces [1]. The Combined spinal epidural anesthesia is similar from both its sides. As Combined spinal epidural is a kind of balanced anesthesia which utilizes techniques instead of using drugs to accomplish the ideal kind of anesthesia for the patients [2].

For the Lower limb procedures in orthopedics and general surgery are one of the most common procedures performed in day to day practice. The technique of spinal anesthesia is simple and it can be easy to perform and has a rapid onset of action.

The technique is not without its any disadvantages and complications but also they include intra-operative hypotension, postdural puncture headache and a limited duration of anaesthesia [3].

Epidural anesthesia is another most commonly used technique for providing surgical anesthesia as well as postoperative analgesia. An advantage of epidural anesthesia includes prolonged and better postoperative analgesia with flexibility of block intraoperatively by varying the degree and level sensory motor block using epidural catheter [4].

The aim of our study was to compare the degree and duration of sensory and motor block using sequential combined spinal epidural block in comparison to spinal. Anesthesia for lower limb surgeries in terms of onset of analgesia, to observe maximum height of the block achieved, to measure the duration of sensory blockade, to measure the degree and duration of motor blockade.

Material

Study population: Total 80 patient were taken in which 40 were male and rest 40 female with both sex belonging to ASA grade 1st and grade 2nd with age group belonging 25 year to 45 year.

Patients were taken from National Institute of medical science and research Jaipur Rajasthan Anesthesia department. Duration of study was 6 month from 1st July 2021 to 31th December 2021.

Method

Patients were randomly divided in two groups and name both group as group 1st and 2nd group

Group I: In group 1st patients received spinal anesthesia at the level of L_{3-4} intervertebral space with 15 mg, (3 ml) of 0.5% hyperbaric bupivacaine.

Group II: In group 2nd Patients received sequential combined spinal epidural anesthesia with 7.5 mg, (1.5 ml) of 0.5% hyperbaric bupivacaine through spinal route and 6 ml of 0.5% bupivacaine through epidural catheter.

Inclusion criteria

The Patients who were not belong ASA (American society of anesthesiologists) grade I and II patients, had age between 25 year to 45 year and duration of surgery 1.5 to 2 hours included in our the study.

Exclusion criteria

The Patients who were contraindication for spinal anesthesia, cardiovascular ailments, Bleeding disorders, Local sepsis around spine and spinal deformities were excluded from our study.

Pre-operative evaluation

All the patient who were going under anesthesia must be go under pre anesthetic checkup. There should be a detailed history and physical examination a day before surgery was done.

The Routine investigations were done in all patients like Complete Blood Count (CBC), Routine Urine examination (Urine RM), Random blood sugar, bleeding time (BT), Clouting time (CT) renal function test (KFT) and ECG, X-ray chest. Patient must be informed about study and taken their consent a written consent form given to all patients who were taken part in study also given written consent was obtained about anesthesia. The patient was explained about regional anesthesia. Tablet Ranitidine 150 mg or Ranitin 150 mg and tablet Alprazolam 0.25mg or Alltop 0.25mg was given to all patients' night before surgery and it was repeated on the day of surgery also.

Anaesthesia technique

When patients reached in operation theatre, the multipara monitor was attached and preoperative pulse rate (PR), blood pressure (BP) and oxygen saturation (SpO_2) was noted. At the Anesthesia workstation all the necessary drugs and equipment were kept ready. An intravenous access was taken using 18 G intracath. Preloading was done with intravenous ringer lactate infusion (10 ml/kg body weight) 20 minutes before surgery. Patients were randomly allocated in different group allotted by computerized generated number system.

Group I

Spinal anesthesia was given after taking all aseptic precaution at the level of L_{3-4} intervertebral space. After confirming the free flow of cerebrospinal fluid (CSF), 3 ml of 0.5% hyperbaric bupivacaine was administered.

Group II

After taking all aseptic precaution sequential spinal epidural anesthesia was administered in sitting position at the level of L_{3-4} intervertebral space. Patients received 1.5 ml of 0.5% hyperbaric bupivacaine through spinal route and 6 ml of 0.5% bupivacaine through epidural catheter immediately after giving supine position. The following intraoperative parameters were studied: Onset of analgesia, Maximum height achieved (Thoracic dermatome), Duration of analgesia in minutes, Maximum Bromage grade achieved, Total duration of motor blockade in minutes

Result

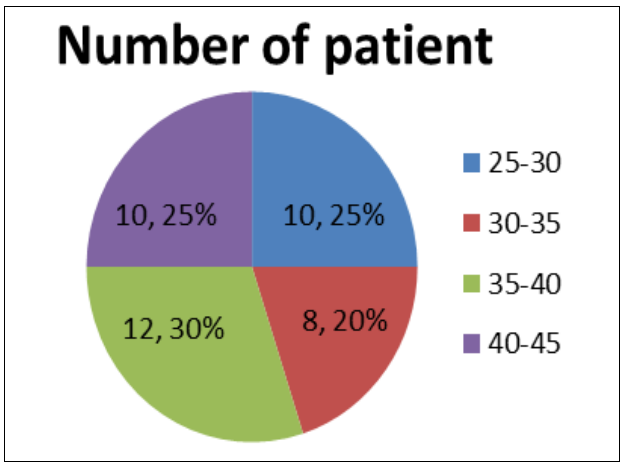
The present study was conducted in 80 adult patients with ASA grade I and II of both sex between the age group of 25 to 45 years who underwent lower limb orthopedic surgeries which was lasting for one and two hours of duration. All patients were divided into two groups containing 40 patients each.

Group I (n=40): In this group patients were received 3 ml of 0.5 % hyperbaric bupivacaine in L_3-L_4 intervertebral space in sitting position.

In our current study we observed that in our group 1 the maximum number of patient belonging to 35-40 year age group the number of patients were 12 the table no 1 gives whole date of patients with their age group.

Table 1: showing the age distribution of group 1 patients

Age distribution	Number of patient
25-30	10
30-35	8
35-40	12
40-45	10



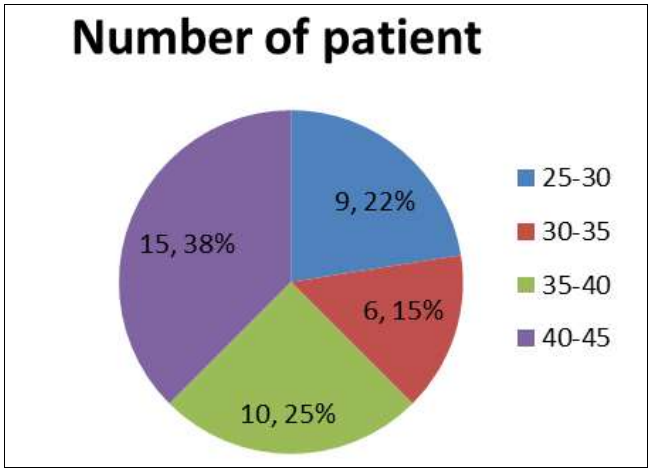
Pie Chart 1: Showing the number of patient with age distribution

Group II (n=40): this group patients received 1.5 ml of bupivacaine in L_3-L_4 intervertebral space in sitting position and 6 ml of 0.5 % isobaric bupivacaine through the epidural catheter.

In our current study we observed that in our group 2 the maximum number of patient belonging to 40-45 year age group the number of patients were 15 the table no 2 gives whole date of patients with their age group.

Table 2: Showing the age distribution of group 1 patients

Age distribution	Number of patients
25-30	9
30-35	6
35-40	10
40-45	15



Pie Chart 2: showing the number of patient with age distribution

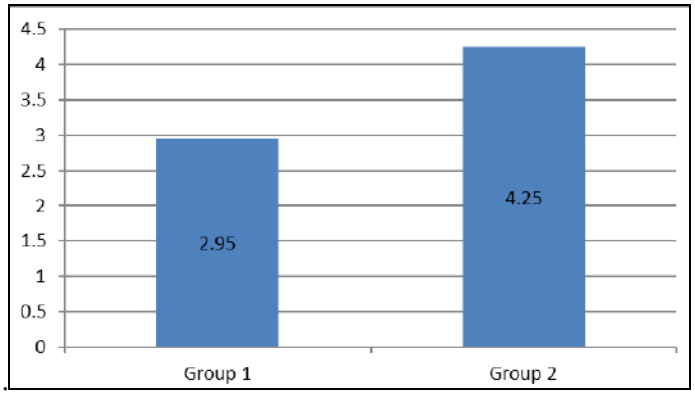
The following intraoperative parameters were recorded:

1. Demographic parameter: age, sex and ASA grade.
2. Quality of block:
 a) Onset of sensory block,
 b) Maximum level of sensory block achieved,
 c) Total duration of analgesia,
 d) Maximum Bromage grade achieved and
 e) Total duration of motor blockage.

Sensory block parameters

In our current study we observed the total time taken by patient for there sensory block, in group 1 patient take about 2.95 min and in group 2.25 min. table number 2 on showing data.

Group 1	2.95
Group 2	4.25



Bar Graph 1: showing both groups in time interval.

Motor block parameters

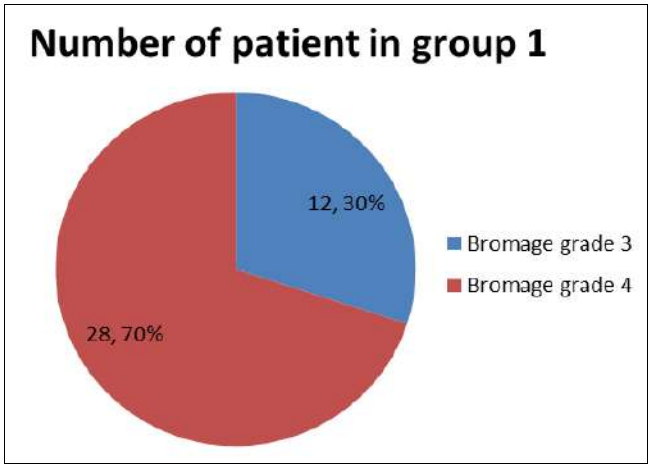
Table 6 shows the distribution of cases according to Bromage grade achieved.

In group I 12 (30%) patients attained Bromage grade 3 and in group II 10 (25%) patient attained Bromage grade 3.

In group I, 28 (70%) patients attained Bromage grade 4, and in group II 30 (75%) patients attained Bromage grade 4.

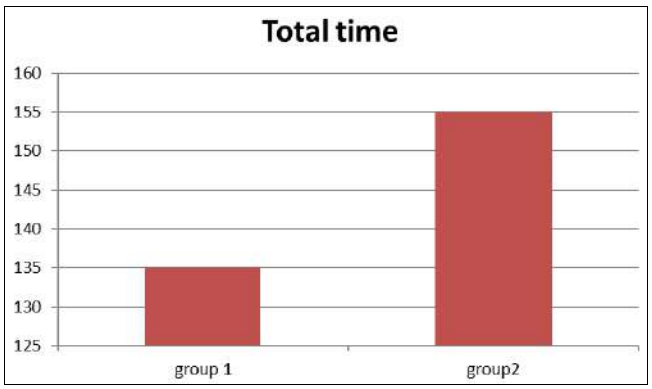
Table 3: Showing number of patient in group 1 using bromage grade 3 and grade 4

Number of Patient in group 1	
Bromage grade 3	12
Bromage grade 4	28



Pie Chart 3: Showing the number of patient who got bromage grade 3 and 4

In our current study we observed that in group 1 patient fell total duration of motor blockage was 135 min and in group 2 it was 155 min. it was show in t give below



Bar Graph 2: Showing both groups time duration of motor blockage.

Discussion

Our study was conducted to compare sequential combined spinal epidural block versus spinal block in lower limb surgery.

We compared between sequential combined spinal epidural block versus spinal block in lower limb surgeries in 80 patients, 40 in each group.

Group I: in case of spinal anesthesia given at the L_{3-4} intervertebral space after using all aseptic precaution. While we confirm the free flow of CSF, now hyperbaric bupivacaine (0.5%) of 3 ml given in space.

Group II: in group 2 we firstly instructed patient for sitting position than we injected 1.5 ml of 0.5% hyperbaric bupivacaine through spinal route and 6 ml of 0.5% bupivacaine through epidural catheter immediately after giving supine position at the level of position at L_{3-4} intervertebral space.

Sensory block

Our current study we observed that the total time taken by patient for their sensory block, in group 1 patient take about 2.95 min and in group 2.25 min. while comparing our study with Akif Mutahar Shah *et al.* [5]. While studding them observed In group I onset of sensory block was 3.25±0.41 and in group II it was 5.07±O.55 minutes, and total duration of analgesia 161.00±29.98 and in group II it was 176.00±25.81minutes which was similar with our study. While comparing with C. R.

Mcandrew *et al*. [6] observed that there was a significantly higher incidence of paraesthesiae with spinal needle insertion in needle-through-needle CSE (37%) versus SSS anesthesia (9%). Another study of Karim Youssef Kamal Hakim [7]. They observed that the Hemodynamic changes were insignificant. Anesthesia readiness time was significantly faster in EVE (Epidural volume extension) group. Motor block and sensory block were better in SCSE (Sequential combined spinal epidural). Postoperative bupivacaine consumption was statistically insignificant between the two groups.

Motor Block.

In our current study we observed that the in group I 12 (30%) patients attained Bromage grade 3 and in group II 10 (25%) patient attained Bromage grade 3. In group I, 28 (70%) patients attained Bromage grade 4, and in group II 30 (75%) patients attained Bromage grade 4. While comparing our study with Akif Mutahar Shah [5] they observed that the mean duration of motor block with SD in group I was 133.00±20.37 and in group II was 150.00±36.10. which was similar with our study, another study of Sunanda Gupta *et al*. [8] study and observed that the motor block characteristics were comparable in all the three groups ($P > 0.05$). The lowest attained values of heart rate, systolic, and diastolic blood pressure were significantly less in Group EVE-S versus Group NEVE ($P = 0.019$, 0.008, and 0.001, respectively), while hemodynamic parameters in Group EVE-H were intermediate. Incidence of hypotension was significantly more in Group EVE-S ($n = 20$, 60.6%), as compared to Group NEVE ($n = 9$, 27.3%, $P = 0.02$) and Group EVE-H ($n = 13$, 39.4%).

Conclusion

The Combined spinal epidural technique has been described in the medical literature for the various uses in many type of surgery, like in orthopedics, trauma surgery of a lower limb, and urological and gynecological surgery. With the help of this technique, surgical anesthesia is established rapidly, saving 15-20 minutes compared to epidural anesthesia.

References

1. Brownridge P. Epidural and subarachnoidal analgesia for elective caesarean section Letter. Anaesthesia 1981; 36:70.
2. Eldor J. Combined spinal epidural general anaesthesia. Reg anaesth. 1994;19:365-6.
3. Felsby S, Juelsgaard P. Combined spinal epidural anaesthesia. Anesthanalg. 1995;80;821-6.
4. Sharma K, Chari P, Gupta S. Combined spinal anaesthesia for lower limb orthopedic procedures. J anaesth clin pharmacol. 1994;10:257-60.
5. Mutahar Shah Akif, Shah Aliya, Riaz Safura, Zaman Muzzafar. Combined spinal-epidural versus spinal anesthesia comparison of efficacy in terms of analgesia and motor and sensory blockade International Journal of Advances in Medicine Shah AM et al. Int J Adv Med. 2021 Apr;8(4):580-585. http://www.ijmedicine.com pISSN 2349-3925 | eISSN 2349-3933
6. Mcandrew CR, Harms P. Paraesthesiae During Needle-through-Needle Combined Spinal Epidural Versus Single-shot Spinal for Elective Caesarean Section Anaesth Intensive Care. 2003;31:514-517.
7. Karim Youssef, Kamal Hakim. Comparative study between sequential combined spinal epidural anesthesia versus epidural volume extension in lower limb surgery Ain – Shams Journal of Anaesthesiology Hakim Ain-Shams Journal of Anesthesiology. 2020;12:4. https://doi.org/10.1186/s42077-020-0055-5
8. Gupta S, Naithani U, Sinha N, Doshi V, Surendran K, Bedi V. Comparison of hydroxyethyl starch versus normal saline for epidural volume extension in combined spinal epidural anesthesia for caesarean secation j obstet Anaesth crit care [serial online] 2021[cited 2022 feb 6];2:16-22.