

A Study on Outcome of Combined Spinal Epidural Anaesthesia in Patients Undergoing Lower Limb Orthopaedic Surgeries in a Rural Tertiary Care Hospital

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Abstract: *Aim: To evaluate the complications and postoperative analgesia with combined spinal - epidural in patients undergoing lower limb orthopedic surgeries. Methods and materials: The study was conducted in 90 patients in age group of 18 – 80 years of ASA 1 and 2 scheduled for lower limb orthopedic surgeries. The double - space combined spinal epidural technique was performed using 2 - 2.5 ml 0.5% H bupivacaine and an additive and after five minutes, a 10 ml 0.25% Bupivacaine solution with 25 - 50 mcg Fentanyl was given epidurally. Onset and level of sensory blockade, duration of analgesia, quality of analgesia using visual analogue scale (VAS), vital parameters were recorded at 0, 5 minutes (min) then at regular intervals. Postoperative analgesia with epidural infusion of 0.125% Bupivacaine with 1mcg/ml fentanyl [at] 5ml/hr for 20 hours. Quality of post - operative analgesia (VAS), BP & HR, need for rescue analgesia were monitored post operatively. Results: Maximum patients attained T8 level (58.9%). The mean duration to achieve grade IV motor blockade was 8.83 ± 1.21 min, the mean duration of analgesia is 10 ± 2.6 hr. This VAS score is almost less than 2 in all patients in the first 4 - 6 hours, 40% of patients needed rescue analgesia after 10 hours. No significant changes in hemodynamic parameters. Conclusion: The CSE technique is an easy method to provide adequate analgesia with stable hemodynamics and less side effects.*

Keywords: combined spinal epidural, orthopedic surgeries, rescue analgesia, VAS

1. Introduction

Major surgeries below the umbilical level need excellent surgical conditions and prolonged and effective postoperative analgesia. Combined spinal - epidural anesthesia (C. S. E.) has been proposed as an alternative technique to standard spinal anesthesia (S. A.)¹. Combined spinal - epidural Anesthesia/Analgesia offers the advantage of both spinal and epidural anesthesia, which includes rapid onset and profound level of anesthesia, the need for supplementary doses, and postoperative analgesia². With the combined spinal - epidural techniques, surgical anesthesia rapidly established, compared with epidural anesthesia.³The majority of lower limb orthopedic surgery patients are old age and have multiple coexisting medical problems⁴. To maintain hemodynamic stability in these patients requires appropriate techniques of regional anesthesia, focusing on maintaining a safe and desirable level of the blockade and limiting extensive sympathetic blockade. Hence this study is focused on the outcome of combined spinal - epidural and postoperative analgesia in lower limb orthopedic surgeries and its complications in tertiary care hospitals with a rural background.

2. Aims and Objectives

Aim

To evaluate the complications and postoperative analgesia with combined spinal - epidural in patients undergoing lower limb orthopedic surgeries.

Primary Objective:

- 1) Pain score on the VAS scale postoperatively.
- 2) The time at which the first rescue analgesia is needed
- 3) Intra - operative heart rate and blood pressure variations
- 4) Complications observed

Secondary Objectives

- 1) Level of maximum sensory and motor blockade
- 2) Time to reach the maximum sensory and motor blockade

3. Materials & Methods

This study was conducted in PESIMSR, Kuppam. After approval from institutional ethical committee, 90 patients of both sexes of age 18 – 80 years, scheduled for lower limb orthopaedic surgeries who were classified as ASA grade 1 and 2 were enrolled after informed consent.

Inclusion Criteria:

- Patients aged between 18 - 80 years.
- Patients with American Society of Anesthesiologists (A. S. A.) grade I & II of either gender.

Exclusion Criteria:

- Patient refusal.
- Patients with A. S. A. grade III, IV of either gender.
- History of allergy to Local anesthetics.
- Patients with bleeding diathesis or clotting abnormality.
- Local infection at the site of combined spinal - epidural block spaces.

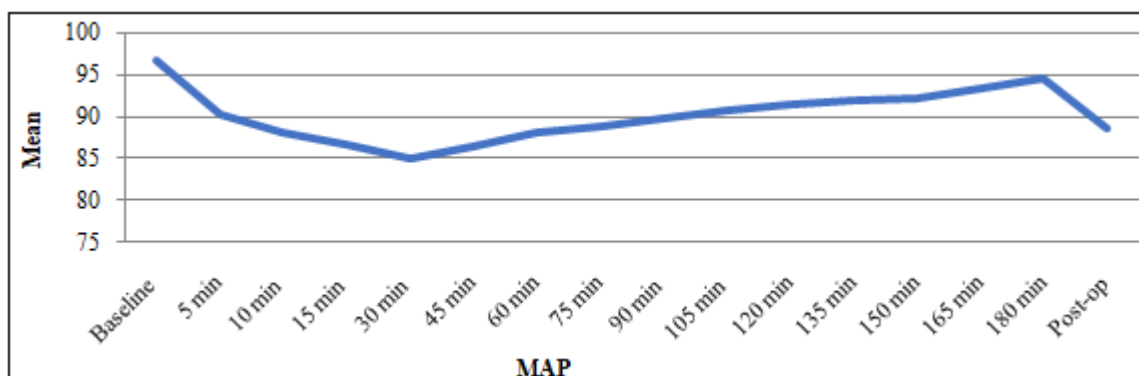
All 5 ASA standard monitors were connected, started on Ringer Lactate 500ml. The double - space combined spinal epidural technique was performed in sitting position. The epidural space was identified at L2 - L3 space with an 18G Tuohy needle using Loss of resistance, epidural catheter was fixed at 8 - 10 cm. Subsequently, sub arachnoid block given using a 25G Q. B. spinal needle in L3 - L4 space using 2 - 2.5 ml 0.5% H bupivacaine and an additive. After five minutes, a 10 ml 0.25% Bupivacaine solution with 25 - 50 mcg Fentanyl was given epidurally. Vital parameters were recorded at 0, 5min then at regular intervals. Sensory blockade assessed by a spirit swab, degree of the motor block using a modified Bromage scale. Hypotension was defined as a fall in baseline systolic blood pressure by 30%. It was treated by intravenous Mephenteramine 6mg intravenously (iv). Bradycardia is defined as the heartrate < 50 bpm was treated by bolus of 0.6mg of atropine iv. Postoperative analgesia was given with epidural infusion of 0.125% Bupivacaine with 1mcg/ml fentanyl[at]5ml/hr for 20hours. Quality of post - operative analgesia (VAS), BP & HR, need for rescue analgesia were monitored post operatively.

for Social Sciences (SPSS) for Windows software (version 22.0; SPSS Inc, Chicago). Descriptive statistics such as mean and standard deviation (S. D.) for continuous variables, frequencies, and percentages were calculated for categorical variables were determined. The paired t - test was used to compare the mean of quantitative variables. Bar charts and Pie charts were used for visual representation of the analyzed data. Level of significance was set at 0.05.

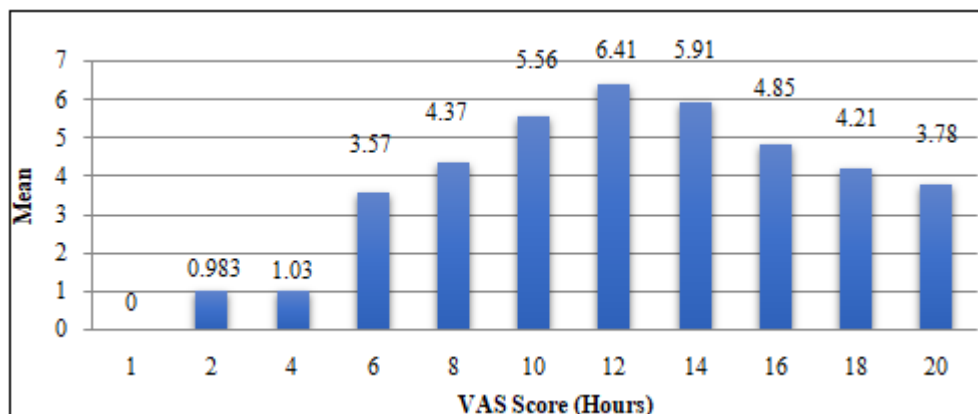
A total of 90 patients were taken up for study and the results showed the average height, weight of study population is 166.11±7.04 cms 60.30±8.35 kgs. The average duration of the surgery is of 2.64±0.32 hours. No significant change in the pulse rate when compared with baseline values in both intraoperatively and postoperatively. Baseline MAP was 96.77 (5.89) mmHg reduced to 85.11 (4.21) mmHg at 30 min, thereafter remained significantly stable throughout the study (Graph 1). Maximum patients attained T8 level (58.9%). The mean duration to achieve grade IV motor blockade was 8.83 ± 1.21 min, the mean duration of analgesia is 10+ 2.6hr. This VAS score is almost less than 2 in all patients in the first 4 - 6 hours, after 8 hours mean VAS score is (4.37+/- 1.84), requiring rescue analgesia. >40% of patients needed rescue analgesia after 10 hours (Table 1). The side effects like nausea (15.6%), PDPH (6.7%) pruritis (6.7%), hypotension (1.1%) were seen

4. Results

Data was entered into Microsoft Excel (Windows 7; Version 2007), and analyses were done using the Statistical Package



Graph 1: Variability of MAP over time



Graph 2: Distribution of VAS scores

Table 1: Distribution of Study Subjects according to the Rescue Analgesia

Rescue Analgesia (Hours)	No.	Percent
6	13	14.4
8	11	12.2
10	17	18.9
10 - 12	32	35.6
12 - 16	17	18.9
Mean (SD)	10.58 (2.60)	
Range	6 - 16	

5. Discussion

Pain is a complex subjective experience, which is difficult to measure in a reproducible way.⁵Satisfactory postoperative analgesia has always been a task in clinical practice⁶. There is a need for satisfactory pain relief for early recovery to decrease postoperative stress.⁷A wide range of options exists to combat pain, both pharmacologically and non-pharmacologically. Combined spinal - epidural anaesthesia found to be superior to Spinal and other methods as it can achieve desired block levels without significant hemodynamic disturbances and for postoperative analgesia.

From our study, we observed that the mean duration of onset of analgesia with 0.25% Bupivacaine + 25mcg fentanyl 10 ml is 4.81 ± 1.47 min whereas other studies such as **Suraj Dhale and Vaishali Shelgaonkar**⁸, in 2000 studied different doses of epidural fentanyl (25µg, 50µg, 75µg) with 0.5% bupivacaine for perioperative analgesia found that 50µg had onset of analgesia within 9.53 min. MAP from baseline was around 96.77 (5.89) mmHg fell to 85.11 (4.21) mmHg at 30 min then picking up slowly to 91.59 (3.56) mmHg at 120 min thereafter remained significantly stable throughout the study. These results were correlated with the study conducted by **Rajan S et al.**,⁹ in which the incidence of hypotension in SCSE was 10%, whereas in spinal it was 80%. Thus, in SCSE, hemodynamic parameters are maintained. In our study. Almost all patients had postoperative VAS score less than 4, which shows good to fair analgesia up to 6 hours (330 - 360 minutes) followed by complaining of pain to which rescue analgesia has been given, and doses of rescue analgesia are also less comparatively which is correlating the study done by **Karaman et al.** 2011¹⁰ showed that the time to first analgesic requirement in fentanyl group was 4.2 ± 3.9 h. **Suraj Dhale et al**⁸. Studied epidural Bupivacaine and epidural Bupivacaine with Fentanyl for perioperative analgesia; they concluded that Fentanyl 50 mcg with Bupivacaine has a longer duration of analgesia (256.66 mins) and ideal for postoperative analgesia with minimum side effects and thus correlating with our study that addition of opioids will reduce the dose of local anesthetics and have prolonged duration of action. In our study, the incidence of nausea is 15.6%, showing similarity with **Parate LH, Manjrekar SP, et al.** 2015¹¹ studies. The incidence of pruritus in our study was 6.7%, which was similar to the study on the incidence of pruritus was around 23%, 8%, 4%, and 4% in obstetric patients receiving epidural fentanyl of concentrations 4, 3, 2, and 1 mcg/ml, respectively

6. Conclusion

Various other methods are available for postoperative & intraoperative analgesia, such as pharmacological methods which are associated with side effects and regional blocks which are technically challenging, and require higher imaging techniques for identifying the anatomy which is difficult in many settings. Therefore, the CSE technique is an easy method to provide adequate analgesia with stable hemodynamics and less side effects.

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