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Original Research Article

Study of Comparison of Ropivacaine With and Without Tramadol for Postoperative Epidural Analgesia at a Tertiary Care Hospital

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ABSTRACT

Background: Untreated pain produces devastating results therefore proper postoperative pain management is essential component of good anaesthetic practice. Bupivacaine, local anaesthesia initially used for epidural analgesia is now replaced by ropivacaine because of its lesser side effects on central nervous system at similar plasma levels. Combination of local anaesthesia with opioids has provided an improved analgesia. The aim of present study was to compare ropivacaine with or without tramadol for postoperative epidural analgesia following lower limb surgeries.

Materials and Methods: A randomised prospective study was conducted on patients undergoing lower limb surgery. A total of 48 patients took part in the study. Epidural anaesthesia was given at L_3- L_4 space and the groups were compared for onset and duration of sensory block and pain scores. Data was compiled and SPSS software was used for analysis.

Results: The duration of sensory block in Group II was much more than Group I with the mean being 3.87 hours in Group I and 6.18 hours in Group II. Pain scores were lower in Group II patients but there was no significant difference between the groups.

Conclusion: Combination of ropivacaine and tramadol provided better and effective analgesia over ropivacaine alone.

Keywords: Analgesia, Bupivacaine, Pain, Ropivacaine.

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INTRODUCTION

Epidural nerve block is widely used for postoperative analgesia. Untreated pain produces devastating results therefore proper postoperative pain management is essential component of good anaesthetic practice.[1] Epidural analgesia with or without adjuvant has provided various advantages over other modalities.[2] Bupivacaine , local anaesthesia initially used for epidural analgesia is now replaced by ropivacaine because of its lesser side effects on central nervous system at similar plasma levels.[3] But it is seen that motor block with ropivacaine is comparatively lesser.[4] Combination of local anaesthesia with opoids has provided an improved analgesia. Tramadol is a mu opoid agonist and interacts with central nervous system and inhibits the withdrawal of nor adrenaline and serotonin.[5] Several trials have proved tramadol to be safe and effective during epidural analgesia.[6,7]

Initially fentanyl was used[8] but side effects associated with fentanyl restricted its use during perioperative procedure.[9] Few studies have been performed comparing epidural analgesia with or without tramadol for postoperative analgesia but most of them have been done in labour setting.[10] The aim of present study was to compare ropivacaine with or without tramadol for postoperative epidural analgesia following lower limb surgeries.

MATERIALS AND METHODS

A randomised controlled trial was conducted in Department of Anesthesia, M M Medical College & Hospital, Kumarhatti, Solan, Himachal Pradesh (India) in a prospective manner. All the patients were informed about the study and a written consent was obtained from all of them. Ethics approval was also obtained from the institutional ethical committee.

A total of 48 patients were enrolled. Patients belonging to ASA grade I and ASA grade II who required lower limb surgery under spinal epidural anaesthesia were included in the study. Patients with history of ischemic heart disease, severe liver disease, contraindication or allergy to regional analgesia, history of diseases predisposing to altered sensation like diabetes mellitus and neuropathies, patients with spinal deformities were not included in the study.

Patients were randomly allocated into two groups. Group I patients received 0.2% ropivacaine and Group II patients received 0.2% ropivacaine with 5 mg/ml of tramadol. Intraoperatively and postoperatively infusion was given according to the drug. Drugs were prepared by a person who was not involved in the operation theatre. All the patients were premedicated with 0.5 mg alprazolam and 150 mg ranitidine a night before surgery.

Patients were shifted to operation theatre and baseline parameters like heart rate, blood pressure, oxygen saturation were recorded. 10 ml/kg of normal saline was administered over a period of 20 minutes after obtaining iv access. Patients were administered epidural black under complete asepsis in sitting position. After infiltration at L_2-L_3, a 16 G tuohy's needle was inserted and epidural catheter was inserted about 4-5 cm in the epidural space and held in place by antiseptic dressing. A 26 G Quincke's spinal needle was inserted at L_3-L_4 in the subarachnoid space and the test solution was injected. Patients were assessed for sensory block till T_9-T_{10}. A score of 2 was considered as complete anaesthesia. Sensory tests were conducted at regular interval and considered successful if it occurred in 25 minutes. The duration of sensory block was considered from the time of onset till the return of sensation.

Motor block was evaluated by movement of lower limb. Time of onset and duration of motor block was recorded. Duration was taken as the time from onset to recovery of movement of limb. Pain was recorded on the basis of verbal rating which is 5 point scale with 0 meaning no pain and 5 meaning unbearable pain. The time of first analgesia was noted. Analgesic efficacy was assessed on the basis of time of first analgesia required. All the parameters like heart rate, blood pressure and oxygen saturation were monitored intraoperatively. Any adverse effects like vomiting, dizziness, respiratory depression was recorded. Data was analysed using SPSS software and expressed as mean +/- Standard deviation. Chi square test was applied as a test of significance. P value of less than 0.05 was considered significant.

RESULTS

A total of 48 candidates took part in this randomised study. Table 1 demonstrates the demographic data related to the patients. Age and weight expressed as mean +/- standard deviation. Ratio of male and female candidates is also given. The onset of both sensory and motor block did not show any significant difference between the two groups. The duration of sensory block in Group II was much more than Group I with the mean being 3.87 hours in Group I and 6.18 hours in Group II. The p value was significant amongst the two groups. The duration of motor block was also higher in Group II compared to Group I ($p<0.05$). (Table 2) Pain scores were lower in Group II patients but there was no significant difference between the groups. The mean first analgesic time was 7.8 hours in group II, which was significantly higher as compared to Group I. In group I the mean time was 5.2 hours. (Table 3) All the parameters like heart rate, blood pressure, oxygen saturation remained stable throughout the study and there was no significant difference between them. No adverse events were noted during the entire study.

Table 1: Demographic Data of Group I and Group II

	Group I	Group II
Age	42.2+/- 10.8	39.7 +/- 12.5
Weight	63.43 +/- 5.31	59.34 +/- 6.21
Male: Female	14/10	18/6

Table 2: Sensory and Motor Block in Group I and Group II

		Group I	Group II	P value
Sensory Block	**Onset (mins)**	11.15 +/- 2.76	10.40 +/-2.31	>0.05
	Duration (hrs)	3.87 +/-0.78	6.18 +/- 1.67	<0.05
Motor Block	**Onset (mins)**	14.51 +/-2.51	12.93 +/- 2.94	>0.05
	Duration (hrs)	3.54+/- 1.21	5.56 +/- 1.02	<0.05

Fig 1: Sensory and Motor Block in Group I and Group II

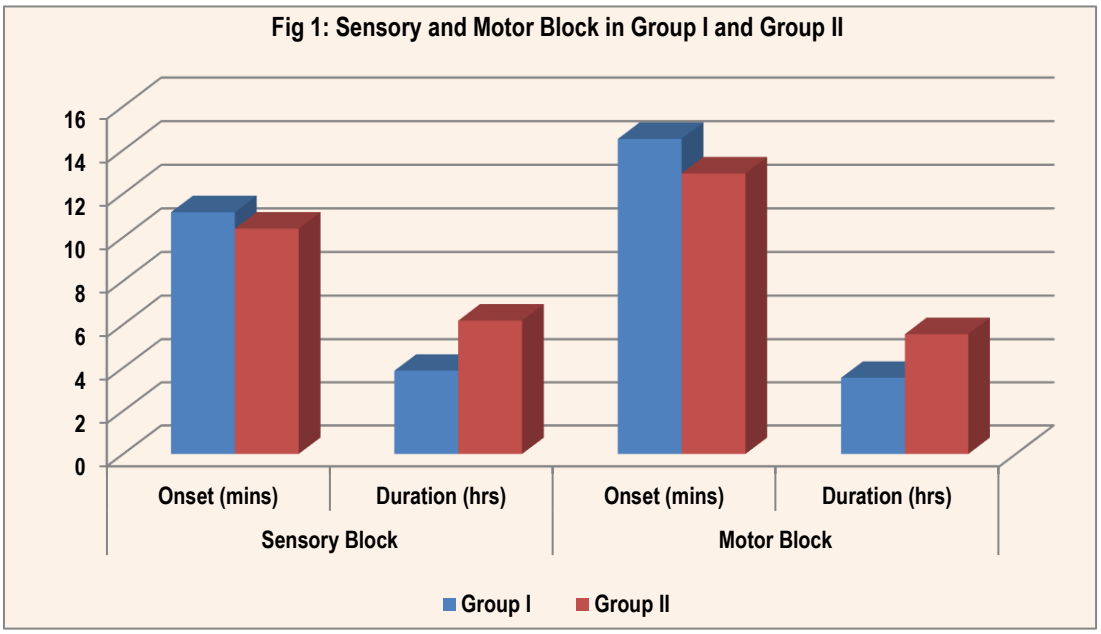

Table 3: Pain scale and First analgesia time

	Group I	Group II	P value
Pain scale	0.45 +/- 0.57	0.37 +/- 0.43	>0.05
First analgesia time (hrs)	5.2 +/- 2.63	7.8 +/- 1.66	<0.05

DISCUSSION

Regional anaesthesia is becoming popular these days in orthopaedic surgery owing to the various advantages it offers. It provides better pain relief, decreased side effects and risk as associated with general anaesthesia.[11] Since the introduction of ropivacaine, there has been increased interest to evaluate its safety and efficacy. Various studies have been undertaken to compare 0.125% ropivacaine and 0.125% bupivacaine as epidural block.[12]Combination of local anaesthesia with opioids has been used widely to enhance the onset of sensory and motor block.[13] Tramadol and fentanyl are the two most widely used adjuncts.[14] Tramadol is a synthetic mu receptor agonist that inhibits nociceptive transmission by increasing the inhibitory activity of descending pain pathway.[15] According to our study, no difference was observed in heart rate, systolic blood pressure, diastolic blood pressure and oxygen saturation during the entire period. The results of the study were in accordance with the study conducted by Sawhney et al.[16] According to a study by Berti et al[17] on patients undergoing major surgery, no difference in hemodynamic status was observed.

According to our study there was significant difference in the duration of sensory & motor blockage between the groups. The results were comparable to the study conducted by Ravi Madhussudhara in which better VAS scores &prolonged duration of block was achieved. But the only difference with our study was that in them supraclavicular brachial plexus block was given.[18] Geze et al compared tramadol and fentanyl as in adjunct to local anaesthesia in axillary nerve block and found that tramadol provided better postoperative analgesia and improved quality of block.[14] In a study by yunxia fan et al[19] comparing tramadol & fentanyl as adjunct to ropivacaine in epidural analgesia for labour pain, they found that tramadol was more effective as compared to fentanyl .In our study, there were no reported side effects. The results were comparable to a study conducted by Krishan Yogesh Sawhney et al[16] who showed a similar incidence of side effects in all their groups. The 1st analgesia time was prolonged in our study in Group II. There was a significant difference between the groups. There were few limitations in our study that a larger sample size should be included and we should have also assessed the degree of ambulation.

CONCLUSION

From the above study we can conclude that combination of ropivacaine and tramodol provide better results compared to ropivicaine alone. It prolongs the duration of motor and sensory block and hence is better and safer choice for postoperative analgesia following lower limb surgery.

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