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Original Research Article

To evaluate the efficacy of Tramadol administered epidurally along with 0.375 % Bupivacaine in patients undergoing lower limb surgeries.

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Abstract:
Background & Method: The aim of this study is to evaluate the efficacy of Tramadol administered epidurally along with 0.375 % Bupivacaine in patients undergoing lower limb surgeries. Patients with absolute contra- indication for epidural block like bleeding disorders or patients on anticoagulant therapy or MAO inhibitors, with raised intra–cranial tension, infection at the site of injection, with neurological deficit and with psychiatric diseases were not included in this study. Patients who were chronic abusers of benzodiazepines and painkillers were also excluded from this study.
Result: The time required for sensory blockade to reach maximum level and then regression to L_1 level. There was no statistically significant diffrerence between the two groups. Mean value for the onset of sensory blockade was found to be 11.55 ± 1.71 in group I and 11.35 ± 2.28 in group II. Max level of blockade achieved was usually between T_7 to T_{10} . The time required for motor blockade. There was no statistically significant diffrerence between the two groups. None of them had any patient scoring bromage scale 2 . time of regression of motor blockade from bromage scale 1 to 0 were 141.10 ± 4.59 & 144.65 ± 2.22 in groups I & II respectively.
Conclusion: No sedative or analgesic was given as preoperative or intraoperatively. Group I. patients received 20ml of 0.375% bupivacaine 0.5% plain + 100mg tramadol (2ml) at different intervals. Addition of tramadol to Bupivacaine epidurally proved to be efficacious for treatment of postoperative pain than analgesic effect of Bupivacaine alone.

Keywords: efficacy, tramadol, bupivacaine & limb surgeries.

Study Designed: Observational Study.

1. INTRODUCTION

Epidural space is a potential space formed by the splitting of the Duramater in the spinal canal, within the cranium, the endosteal and meningeal layers of Duramater are closely united but below the foramen magnum, the two layers separate, the outer becoming periosteal lining of the spinal canal while the inner layer forms the spinal Duramater[1].

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In the embryo, the epidural space is very narrow because Duramater and its contents almost completely fill the vertebral canal. Later the vertebral canal grows faster in both the length and width than does the dural sac, and the epidural space therefore becomes larger especially posteriorly[2].
The posterior part of the epidural space is wider than the anterior part as the anterior part of the Duramater is applied fairly closely to the posterior longitudinal ligament, over the vertebral bodies and intervertebral discs[3]. Thus anterior epidural space is little more than potential.
Because dura adheres firmly to the periosteum around the foramen magnum, the spinal and cranial epidural space does not communicate, the spinal and cranial epidural space does not communicate[4]. The posterior dura and the ligamentum flavum between cervical first, second and third lies closely together so that for all practical purposes there is no epidural space. Below the level of C3 the space is very narrow as the cervical spinal cord is large and the vertebral canal is small, so that cervical approach above C5 is not recommended[5].

2. MATERIAL & METHOD

Present study is conducted at Amaltas Institute of Medical Sciences, Dewas, M.P. from July 2021 to June 2022. 60 patients, all of ASA grade I and II and of age ranging from 18-55 years were selected randomly. All the patients were selected from the routine and emergency operative lists that were scheduled to undergo lower limb surgery.
Patients with absolute contra- indication for epidural block like bleeding disorders or patients on anticoagulant therapy or MAO inhibitors, with raised intra–cranial tension, infection at the site of injection, with neurological deficit and with psychiatric diseases were not included in this study. Patients who were chronic abusers of benzodiazepines and painkillers were also excluded from this study.
All the patients were examined preoperatively. A thorough general physical examination and systemic examination was done to rule out contra – indicating factors for epidural block. Systemic examination was carried out to assess the cardio – respiratory status to rule out any gross dysfunction. Age, PR, HR, B.P., R.R., sex, height, and weight of all the patients were noted.

3. RESULTS

Table 1: DEMOGRAPHIC DATA (MEAN ± SD)

	Group I		**Group II**		**P Value**
	Mean	SD	Mean	SD	
Age (years)	30.65	7.19	34.1	8.94	0.91
Weight	61.75	7.49	64.11	7.14	0.14

Height	157.4	7.66	159.9	8.23	0.52

The demographic data. No statistically significant diffrerence between the two groups as regard the age , weight and height is SDen.

Table 2: TIME OF SENSORY BLOCKADE (MEAN ± SD)

	Group I		**Group II**		**P Value**
characteristics	Mean	SD	Mean	SD	
Time for onset of sensory block (min)	11.55	1.71	11.35	2.28	0.21
Time to reach max level (min)	23.95	2.57	21.75	2.35	0.32
Time to regress to L_1 level (min)	153.33	2.36	151.84	2.39	0.78

The time required for sensory blockade to reach maximum level and then regression to L_1 level. There was no statistically significant diffrerence between the two groups. Mean value for the onset of sensory blockade was found to be 11.55 ± 1.71 in group I and 11.35 ± 2.28 in group II. Max level of blockade achieved was usually between T_7 to T_{10} .

Table 3: TIME OF MOTOR BLOCKADE (MEAN ± SD)

	Group I		**Group II**		**P Value**
Characteristics (min)	Mean	SD	Mean	SD	
Time to reach Bromage scale 1	33.58	1.31	32.75	1.96	0.09
Time to reach Bromage scale 0	141.10	4.59	144.65	2.22	0.23

The time required for motor blockade. There was no statistically significant diffrerence between the two groups. None of them had any patient scoring bromage scale 2 . time of

regression of motor blockade from bromage scale 1 to 0 were 141.10 ± 4.59 & 144.65 ± 2.22 in groups I & II respectively.

4. DISCUSSION

Tramadol is a weak agonist at all types of opioid receptors, with some selectivity for mu receptors. It has also, non-opioid receptors mechanisms of action that may contribute to the analgesia profile .Tramadol inhibits noradrenline and serotonin reuptake, it stimulate, serotonin release. Noradrenaline and serotonin are transmitters in the descending inhibitory pathways which enhance analgesia[6].

Previous reports have shown that the combination of an opioid as an a2 adrenergic agonist may act synergistically for the analgesia response without potentiating respiratory depression[7].

Many trials were done to justify the dose of tramadol and the best route of administration, and conduced that, in adults, the optimal initial dose of tramadol would be 3mg/kg for acute pain of moderate to severe intensity[8]. Although intravenous route gives rapid action but the epidural route has the benefits of longer duration of action especially if used with local anesthetics and less side effects as nausea and vomiting.

Analgesia the present study showed that both 100 and 200mg epidural tramadol provide adequate postoperative pain relief following lower limb orthopedic procedures as evidenced by lower pain scores, longer mean time to the first analgesia request, and less requirement for supplementary analgesics than in patients receiving epidural bupivacaine alone, postoperatively. The delayed onset of the analgesic action of tramadol was only observed in the control group[9]. They needed longer time to be satisfied with fair pain relief. That was not observed in the groups which received tramadol preoperatively. This could be explained by the pharmacokinetic properties of the drug.

5. CONCLUSION

No sedative or analgesic was given as preoperative or intraoperatively. Group I. patients received 20ml of 0.375% bupivacaine 0.5% plain + 100mg tramadol (2ml) at different intervals. Addition of tramadol to Bupivacaine epidurally proved to be efficacious for treatment of postoperative pain than analgesic effect of Bupivacaine alone.

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