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A study of pain score: A comparative pain score evaluation of lumbar epidural block using 0.5% bupivacaine and 0.5% bupivacaine with ketamine

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Abstract

Intrathecal and epidural administration of opioids are widely used even now. Opioid administration intrathecally or epidurally causes dependable method of pain relief without affecting motor functions or other sensory modalities such as touch sensation. This study is an effort to find the efficacy of lumbar epidural block using 0.5% bupivacaine vs 0.5% bupivacaine with ketamine.

Keywords: Epidural, bupivacaine, ketamine, pain score

Introduction

Epidural block using local anaesthetic drugs are used in clinical practice since many years [1-3]. It further got revolutionized with the better understanding of opioid receptors by Martin & Coworkers in 1976. Intra spinal morphine was first used in 1979, which opened up a new exciting way of pain management [4, 5].

Mankowitz E *et al.* (1982) [6] first used epidural ketamine. Ketamine hydrochloride 4 mg in 10 ml of 5% dextrose water was administered epidurally to 7 patients suffering from intractable pain in the back, lower abdomen and legs. Pain relief was obtained in all cases. Duration of action varied from half an hour to more than six hours. Naguib M *et al.* (1986) [7] studied thirty-four patients ASA physical status I or II scheduled for gall bladder surgery in a comparative prospective trial to evaluate the efficacy of epidural and intramuscular ketamine for post-operative pain relief. They were divided randomly into three groups. Group I (11 patients) received 30 mg intra muscular ketamine. Group II (10 patients), Group III (13 patients) received 10 and 30 mg ketamine in 10 ml Saline respectively through epidural catheters. Pain was evaluated every two hours for first 24 hours post operatively by using linear analogue pain scale from 0 — 10. Ketamine was given on patients' request and whenever pain score exceeded three. Ketamine produced analgesia in all the patients studied. Reduction of pain score after two and four hours in Group I and III was significant when compared to Group II. Seven patients (54 percent) in Group III did not require further analgesia after the initial injection. However, following 10 mg epidural ketamine or 30 mg IM ketamine, post-operative pain was more frequent. Four patients who received epidural ketamine complained of transient burning pain in the back during injection. This study is an effort to find the efficacy of lumbar epidural block using 0.5% bupivacaine vs 0.5% bupivacaine with ketamine.

Aims and Objectives

This study is an effort to find the efficacy of lumbar epidural block using 0.5% bupivacaine vs 0.5% bupivacaine with ketamine.

Materials and Methods

A prospective randomized double-blind study was conducted in 60 patients admitted at for various elective surgical procedures during the period 2018 -2019. Surgical procedures which required blockade below T6 dermatome was only selected.

Inclusion criteria

- ASA physical status — I- patients
- Both male and female

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- 20 -40 years age groups
- Weight 40 -90 kgs

Exclusion criteria

- Difficult airway
- Previous history of anaesthetic complications
- History of local anaesthetic allergy
- Spinal deformities
- Preexisting neurological deficits
- Cases with contra indication to regional anaesthesia

Total sample sizes of 60 patients were randomly allocated into two groups. Control groups-Group-I-received 0.5% bupivacaine, 1.5 ml. spinal segment to be blocked (n=30); (Not exceeding 2mg /kg body weight) and Group-II(n=30) received bupivacaine 0.5% 1.5ml.spinal segment to be blocked plus preservative free 1% ketamine in a dose of 0.5mg.kg body weight.

On the previous day of surgery, a detailed pre anaesthetic evaluation were done in all cases. Procedure was explained and written informed consent were obtained from the patients and relatives. All patients were kept nil per oral from 10.00 P.M on the previous day of surgery and premedicated with tablet. Diazepam 0.2mg.kg body weight.

Procedure

On the day of surgery, in the operating room 18-gauge

intravenous cannula was placed in a peripheral vein in the non-dominant upper limb and patients were connected to monitors. Non-invasive blood pressure (NIBP). Pulse oximetry and continuous ECG were recorded on Philips monitor (Agilent 1204 A model). All patients received intravenous premeditation with Injection diazepam 0.2mg.kg body weight mixed with 21.3mg of lignocaine 2% over 5 minutes. Base line blood pressure and heart rate were recorded. All patients were preloaded with intravenous fluid-ringer lactate 10ml.kg body weight before performing epidural block.

All patients were put in left lateral position and under all aseptic precautions lumbar L3-L4 interspace was identified and infiltrated with 1ml of 2% Lignocaine. Epidural space were identified by introducing a 18 gauge Tuohy needle using loss of resistance technique. Group-I-patients (n=30) received bupivacaine 0.5% 1.5ml. spinal segment to be blocked and Group-II-Patients (n=30) received bupivacaine 0.5% 1.5ml. spinal segment to be blocked plus preservative free ketamine 1%, 0.5mg.kg body weight as single shot epidurals. Patients were made to lie down supine and an independent fellow resident recorded the following study parameters. Post-operative pain score by modified visual analogue scale (VAS)

Results

Table 1: Shows the distribution of patients according to pain score.

Score Scale	Number of patients			
	Group I	%	Group II	%
0	0	0.0	0	0.0
1	0	0.0	1	3.3
2	1	3.3	5	16.7
3	2	6.7	20	66.7
4	1	3.3	2	6.7
5	5	16.7	0	0.0
6	9	30.0	2	6.7
7	8	26.7	0	0.0
8	4	13.3	0	0.0
9	0	0.0	0	0.0
10	0	0.0	0	0.0
Total	30	100.0	30	100.0

Discussion

About 90% of the patients in Group I has a pain score of ≥ 4 compared to 13.4% in Group II corresponding to the same score. The means (\pm SD) pain score for Group II (3.03 ± 1.0) was significantly less than Group I (5.97 ± 1.52) (Table 10, $p < 0.05$, based on Mann-Whitney - u-test for independent samples) Mean pain score for Group II (3.03 ± 1.0) was significantly less than Group I (5.97 ± 1.52) based on Mann-Whitney U test for independent samples at $P < 0.05$. Intrathecal and epidural administration of opioids are widely used even now. Opioid administration intrathecally or epidurally causes dependable method of pain relief without affecting motor functions or other sensory modalities such as touch sensation. Epidural block using local anaesthetic drugs are used in clinical practice since many years. It further got revolutionized with the better understanding of opioid receptors by Martin & Coworkers in 1976. Intra spinal morphine was first used in 1979, which opened up a new exciting way of pain management.

Conclusion

Mean pain score for Group II (3.03 ± 1.0) was significantly less than Group I (5.97 ± 1.52) based on Mann-Whitney U test for independent samples at $P < 0.05$

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