



A COMPARISON OF COMPLICATIONS FACED DURING LUMBAR EPIDURAL BLOCK USING 0.5% BUPIVACAINE VS 0.5% BUPIVACAINE WITH KETAMINE

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ABSTRACT

Life threatening complication of intra spinal morphine in the form of delayed respiratory depression limit it's usage in the present era of day care surgery and anaesthesia. Search for better intraspinal drugs continued which are devoid of major side effects . presently fentanyl, sufentanyl, Clonidine, ketamine etc are in use. These agents are used in combination with local anaesthetics or alone with various comparable results. This study was undertaken to compare the complications of lumbar epidural block using 0.5% bupivacaine with and without preservative free ketamine.

KEYWORDS : Complications, Lumbar Epidural, Bupivacaine, Ketamine.

INTRODUCTION:

Life threatening complication of intra spinal morphine in the form of delayed respiratory depression limit it's usage in the present era of day care surgery and anaesthesia. Search for better intraspinal drugs continued which are devoid of major side effects . presently fentanyl, sufentanyl, Clonidine, ketamine etc are in use. These agents are used in combination with local anaesthetics or alone with various comparable results. Ketamine a phencyclidine derivative was synthesized in 1962 by Stevens and was used in human by Corssen and Domino in 1965. Ketamine was released for clinical use in 1970 and it is widely used even now as an induction agent under specific conditions. Unique feature of ketamine when comparing to other induction agents is it's significant analgesic property. Epidural ketamine was first used by MankowitzE et al in 1982¹. Ketamine hydrochloride 4mg in 10ml 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 6 hours. No adverse effects were noted and no detectable neurological damage resulted in majority of the studies^{2,5}. Intra spinal ketamine offers the advantage over opiates in that delayed respiratory depression is unlikely to occur.

Epidural ketamine acts by depressing the excitation of a class of dorsal horn neurons classified as wide dynamic range neurons (WDR). These cells have been associated with central processing of pain. There had been evidence to suggest that ketamine binds stereo specifically to opioid receptors in brain and spinal cord. Ketamine has local analgesic property. It acts as a non-competitive NMDA (N-Methyl-D-Aspartic acid) receptor antagonist and it plays a role in alpha adrenergic mediation and serotonergic mediation. This study was undertaken to compare the complications of lumbar epidural block using 0.5% bupivacaine with and without preservative free ketamine.

AIMS AND OBJECTIVE:

To compare the complications faced during 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 A.J.Institute of Medical Sciences for various elective surgical procedures during the period 2016 -2017. Surgical procedures which required blockade below T6 dermatome was only selected.

INCLUSION CRITERIA

- ASA physical status -I - patients

Exclusion Criteria

- Difficult airway
- Previous history of anaesthetic complications

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 parameter.

- Intra or post operative complications

Patients were monitored for 24 hours in postoperative ward after surgery.

RESULTS:

Table 1 and figure 1 shows distribute of patients according to complications. It was observed that the percentage of patients with shivering, Shivering and urinary retention, and urinary retention were not significantly different between the two groups. However, the overall percentage of patients with post-operative complications were significantly lower in Group II (20.0%) than that in Group I (50%) (Table 1; P<0.05, based on normal distribution Z –test).

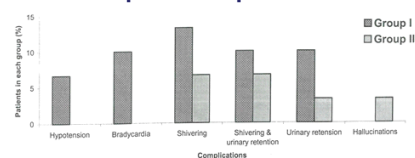
Table 1 Distribution of patients according to complications

Hypotension	2	6.7	0	0.0	#
Bradycardia	3	10.0	0	0.0	#
Shivering	4	13.3	2	6.7	0.43
Shivering & Urinary retention	3	10.0	2	6.7	0.99
Urinary retention	3	10.0	1	3.3	0.52
Hallucinations	0	0.0	1	3.3	#
Total	15	50.0	6	20.0	2.17*

*Significant at P<0.05

Statistical comparison not possible

Figure 1. Distribution of patients according to complications, n=30 in each of Group I and Group II



DISCUSSION:

In our study we found that Intra and postoperative complications were comparable between bupivacaine plus ketamine group and

bupivacaine group. However over all complications were more in bupivacaine group (Statistically significant $p < 0.05$). Clinically hypotension requiring vasopressor therapy were seen in 2 patients and bradycardia requiring treatment with injection atropine were seen in 3 patients. This side effects were not observed in bupivacaine plus ketamine group probably because of the sympathetic stimulation caused by ketamine. This observation correlates with the study of **Jankovic Z et al (1999)**⁶. They did a randomized double blind study to know the effects of intra operative epidural administration of ketamine added to bupivacaine compared with fentanyl added to bupivacaine. One group received 20ml of 0.125% bupivacaine plus 50 mcg of fentanyl and other group received 20 ml of 0.125% bupivacaine plus 50 mg ketamine. They observed higher systolic blood pressure in ketamine bupivacaine group. No statistically significant difference between groups in heart rate during operation. They also observed that fentanyl added to bupivacaine caused higher incidence of hypotension than ketamine added to bupivacaine.

In our study shivering was also less in bupivacaine-ketamine group (67%) when compared to plain bupivacaine group (13.3%). This result can also be attributed to the sympathetic stimulation caused by ketamine.

One patient in bupivacaine plus ketamine group had hallucinations. In our study we found that ketamine in adose of 0.5mg.kg body weight combined with 0.5% bupivacaine in lumbar epidural block provided good postoperative analgesia and low mean pain score (modified visual analogue scale). But this result does not correlated with the study of **Weir PS et al (1998)**⁷ who concluded that addition of ketamine even at a dose of 0.67mg.kg along with 0.5% bupivacaine did not improve extra dual block in adult patients undergoing total knee replacement: In our study majority of the patients in both groups were operated for inguinal herniorraphy. Pain produced by a total knee replacement may be much more severe than an Inguinal herniorraphy pain. This my explain the inefficiency of epidural ketamine to relieve postoperative pain in Weir PS et al study, since the intensity of pain can vary with different surgical procedures.

CONCLUSION:

Intra operatively epidural bupivacaine plus ketamine group showed lower incidence of hypotension and bradycardia.

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