

**A Clinical Study of Intrathecal Ketamine with Adrenalin for Lower Abdominal Surgeries**

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**Citation this Article:** Dr. Jayesh shakeet, Dr. Naveen Kumar Singh, “A Clinical Study of Intrathecal Ketamine with Adrenalin for Lower Abdominal Surgeries”, IJMSIR- February - 2020, Vol – 5, Issue -1, P. No. 32 – 35.

**Type of Publication:** Original Research Paper

**Conflicts of Interest:** Nil

**Abstract**

**Background:** Ketamine, a phencyclidine derivative has recently been found to be effective by epidural and intrathecal routes. It possesses some definite advantages over the conventional local anaesthetic agents as it stimulates cardiovascular system and respiratory system

**Methods:** Hospital based prospective study conducted on randomly selected 100 Patients for elective lower abdominal surgeries. Patients with severe systemic disease metabolic disorders, neurological, congenital or cardiovascular diseases were excluded from this study.

**Results-** In the present study the maximum level achieved ranged from T6-T10. The time taken to achieve maximum sensory blockade ranged from 2-8 minutes. Intra-operatively, nystagmus was seen in all patients. Sedation and delirium was seen in 76 patients and 3 patients respectively.

**Conclusion:** We conclude that intra thecal ketamine with adrenaline produces a reliable anaesthesia, better operative conditions and patients comfort with minimal side effects in elective lower abdominal surgeries.

**Keywords:** Anaesthesia, Ketamine, Adrenaline, Intrathecal.

**Introduction**

Spinal anaesthesia is simplest regional anaesthesia technique which was first performed by August Bier. Safe practice of spinal anaesthesia depends on proper selection, preparation of patient with appropriate drugs and managing the physiologic side effects throughout the procedure as well as in early recovery phase<sup>1</sup>

Over a 100 years, local anaesthetics were used for neuraxial blockade and in subsequent time after discovery of opioid receptors in spinal cord, usage of opioids as adjuvants in neuraxial anaesthesia became famous. This lead to research on discovery of transmitter and receptors involved in pain transmission and modulation by using different pharmacological agents<sup>2</sup>

Ketamine, a phencyclidine derivative has recently been found to be effective by epidural and intrathecal routes. It possesses some definite advantages over the conventional local anaesthetic agents as it stimulates cardiovascular system and respiratory system.<sup>3</sup> The onset of anaesthesia (sensory block) and motor paralysis is found to be earlier than the conventional local anaesthetics.<sup>4</sup> Intensity of sensory block is 100% as it is described to be due to potent analgesic effect of ketamine.<sup>5-6</sup>

**Material and Methodology**

After informed and written consent, ASA Physical status I and II aged 18-65 years, of either sex randomly selected 100 Patients for elective lower abdominal surgeries were been enrolled after inclusion and exclusion criteria. Patients with severe systemic disease metabolic disorders, neurological, congenital or cardiovascular diseases were excluded from this study. On the eve of surgery, all the patients were visited and a detailed examination is done along with routine investigations like CBC, Urine routine, random blood sugar ECG, chest X ray, blood grouping, blood urea and serum Creatinine whenever necessary. Once the patient was shifted to the operating room, patient was connected to routine standard monitors and keeping ready anaesthesia trolley and machine.

**Results**

In the present study, the 64% patients were male and 36% patients were female.

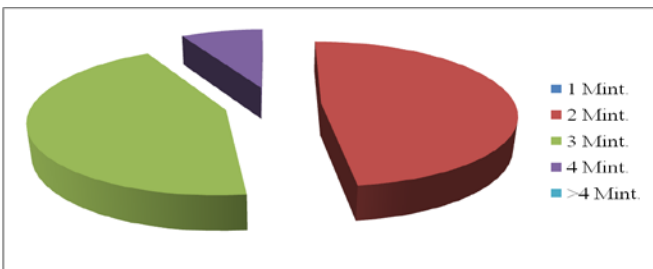


Fig.1: Onset of sensory Blockade (minutes)

In the present study, the onset of analgesia ranged from 2- 4 minutes.

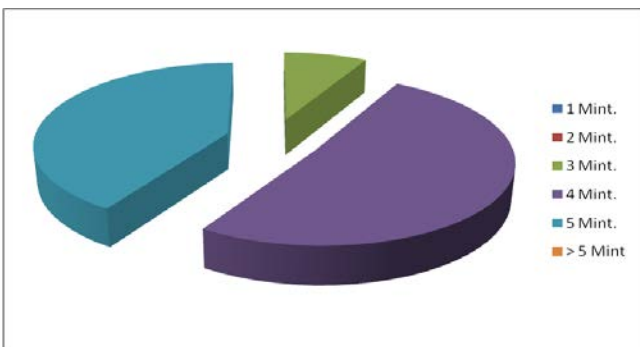


Fig.2. Onset of motor Blockade (minutes)

In the present study, the onset of motor blockade ranged from 2- 5 minutes.

Table 1: Duration of Sensory Blockade (Minutes)

Duration of Sensory Blockade (Minutes)	No of patients	Percentage
40-60	6	6.00
61-80	33	33.00
81-100	58	58.00
101-120	3	3.00
>120	0	0.00
Total	100	100.00

In the present study, the duration of sensory blockade ranged from 61-100 minutes.

Table 2: Duration of Motor Blockade (Minutes)

Duration of Motor Blockade (Minutes)	No of patients	Percentage
80-90	11	11.00
91-100	15	15.00
101-110	27	27.00
111-120	24	24.00
121-130	23	23.00
>130	0.0	0.00
Total	100	100.00

In the present study, the duration of motor blockade ranged from 80-130 minutes.

Table 3: Maximum Level Achieved

Maximum Level Achieved	No of patients	Percentage
T6	4	4.00
T8	19	19.00
T10	77	77.00
>T10	0	0.00
Total	100	100.00

In the present study the maximum level achieved ranged from T6-T10.

Table 4: Complication

Complication	No of patients	Percentage
Nausea	0	0.00
Vomiting	0	0.00
Hypotension	0	0.00
Delirium	3	3.00
Neurological	0	0.00
Sedation	76	76.00
Nystagmus	100	100.00
Dizziness	0	0.00
Total	100	100.00

In the present study, the most common complication was nystagmus, which was present in all patients, followed by sedation, which occurred in 76 patients.

There was no significant variation in heart rate, mean systolic and diastolic blood pressure.

### Discussion

Spinal anaesthesia is a time honoured procedure for producing surgical analgesia and its importance is increasing day by day as it possesses certain advantages over general anaesthesia.

Though a number of drugs have been used for inducing spinal anaesthesia their use has been usually associated with the occurrence of undesirable side effects such as hypotension and bradycardia in lower abdominal surgeries. Therefore, there is a need for find out a safer, effective and reliable spinal anaesthetic, which has rapid onset of action, excellent analgesia, and satisfactory muscle relaxation with a wide margin of safety.

Ketamine a phencyclidine derivative is a potent analgesic and its sympathomimetic effects may be useful in trauma and emergency cases. The present study is to evaluate the efficacy of Ketamine given

intrathecally as spinal anaesthesia agent and to study its onset of sensory blockade, duration of sensory blockade, motor blockade and the occurrence of delirium reaction and other complications if any and whether Ketamine can be safely recommended for lower abdominal surgeries.

In the present study the onset of sensory blockade ranged from 2-4 minutes. In the study conducted by Dipasri Bhattacharya et al<sup>7</sup>, it was reported that onset of sensory blockade ranged from 1-2 minutes with a mean of  $1.38 \pm 0.05$  (SE).

In the present study duration of sensory blockade ranged from 60-100 minutes. In the study conducted by Dipasri Bhattacharya et al<sup>7</sup>, it was reported that duration of sensory blockade ranged from 90-140 minutes with a mean of  $122 \pm 3.34$ .

In the present study, the maximum level achieved ranged from T6-T10. In majority of the male and females, the maximum level achieved was T10. In the study conducted by Bion JF et al<sup>8</sup>, they reported that the maximum level achieved ranged from T10-T12 in majority of them the maximum level achieved was T0. The present study was in accordance with their study.

In the present study, the onset of motor blockade ranged from 2-5 minutes. In the study conducted by Dipasri Bhattacharya et al<sup>7</sup>, the onset of motor blockade ranged from 2-4 minutes with a mean of  $2.35 \pm 0.07$ .

In the present study, the duration of motor blockade ranged from 80-130 minutes. In the study conducted by Dipasri Bhattacharya et al<sup>7</sup>, it was reported that the duration of motor blockade ranged from 90 to 140 minutes with a mean of  $127 \pm 1.79$ .

In the present study the most common complication was nystagmus, which occurred in all the patients. Sedation was seen in 76 patients and delirium reaction was seen in 3 patients.

In the study conducted by Chris Hawksworth et al<sup>9</sup>, nystagmus occurred in six out of ten patients, four patients developed psychomimetic disturbance. One complained of simply feeling strange and three patients had frank hallucination.

### **Conclusion**

We conclude that intra thecal ketamine with adrenaline produces a reliable anaesthesia, better operative conditions and patients comfort with minimal side effects in elective lower abdominal surgeries.

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