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Original Research

Effectiveness of ketamine in patients with chronic low back pain

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ABSTRACT:

Background: Chronic low back pain is a persistent discomfort or ache in the lower back that lasts for an extended period. The present study was conducted to assess the effectiveness of ketamine in chronic low back pain patients. **Materials & Methods:** 50 patients with chronic low back pain were divided into 2 groups of 25 each. Group I patients were given 25 mg ketamine and Group II patients were given 50 mg ketamine as adjunct to 40 mg triamcinolone in total 6 ml volume given epidurally. The pain and side effects were recorded. **Results:** The mean age in group I was 465.7 years and in group II was 46.2 years. The mean weight was 65.2 kgs in group I and 64.4 kgs in group II. The mean height was 155.2 cm in group I and 156.8 cm in group II. The difference was non- significant (P> 0.05). The mean VAS at baseline in group I was 72.3 and in group II was 82.4. At 2 weeks, in group I was 46.2 and in group II was 52.6, at 4 weeks in group I was 42.6 and in group II was 41.7, at 8 weeks in group I was 36.8 and in group II was 30.5. At 12 weeks was 31.5 in group I and 30.2 in group II. The difference was significant (P< 0.05). Common complications were nausea seen in 5% in group I and 14% in group II, hallucinations 4% in group I and 12% in group II, hypertension 7% in group I and 2% in group II and tachycardia 3% in group I and 5% in group II. The difference was significant (P< 0.05). **Conclusion:** Authors found that when treating patients with chronic low back pain, ketamine at a dosage of 50 mg is more effective than 25 mg.

Key words: Chronic low back pain, Hypertension, Ketamine

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INTRODUCTION

Chronic low back pain is a persistent discomfort or ache in the lower back that lasts for an extended period, typically for more than three months. It can have various causes, and the pain may range from mild to severe. Chronic low back pain can significantly impact an individual's quality of life, daily activities, and overall well-being.[1]

The neuropathic feature of chronic pain is caused by pre-synaptic NMDA receptor sensitization, which increases glutamate release and its phosphorylation at the post-synaptic location, resulting in the wind-up phenomena.[2] Based on this idea, ketamine, an NMDA receptor antagonist with local anesthetic and modest opioid receptor action, has been utilized for acute postoperative and chronic neuropathic pain problems in a variety of doses via intrathecal and epidural routes. The aforementioned experiments do not indicate a single effective medication dosage.[3]

According to current theories of pain, inflammation causes a rise in glutamate and aspartate, which has a known involvement in central sensitization and end up. Wind up can increase the amplitude and duration of dorsal horn neurons' responses by up to 20 times.[4] NMDA receptor antagonists stop the central sensitization process from starting and continuing, which is typically expressed as a drop in pain threshold following injury and hypersensitivity of the withdrawal reflexes.[5] Ketamine is commonly used as an analgesic in emergency medicine and as an adjuvant drug in the perioperative setting. In addition, it is used as a third-line adjuvant drug for opioid-resistant pain in palliative care and for intractable chronic noncancer pain.[6,7] The present study was conducted to assess the effectiveness of ketamine in chronic low back pain patients.

MATERIALS & METHODS

The present study was conducted on 50 patients with chronic low back pain of both genders. All were informed regarding the study and their written consent was obtained.

Demographic data of patients such as name, age, gender was recorded. Patients were divided into 2 groups of 25 each. Group I patients were given 25 mg ketamine and Group II patients were given 50 mg

ketamine as adjunct to 40 mg triamcinolone in total 6 ml volume given epidurally. The pain was recorded using visual analogue scale (VAS). Side effects were also recorded. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II	P value
Age (years)	45.7	46.2	0.79
Weight (Kgs)	65.2	64.4	0.82
Height (cm)	155.2	156.8	0.93

Table I shows that the mean age in group I was 465.7 years and in group II was 46.2 years. The mean weight was 65.2 kgs in group I and 64.4 kgs in group II. The mean height was 155.2 cm in group I and 156.8 cm in group II. The difference was non- significant (P> 0.05).

Table II Comparison of VAS in both groups

VAS	Group I	Group II	P value
Baseline	72.3	82.4	0.02
2 weeks	46.2	52.6	0.05
4 weeks	42.6	41.7	0.92
8 weeks	36.8	30.5	0.96
12 weeks	31.5	30.2	0.86

Table II, graph I shows that the mean VAS at baseline in group I was 72.3 and in group II was 82.4. At 2 weeks, in group I was 46.2 and in group II was 52.6, at 4 weeks in group I was 42.6 and in group II was 41.7, at 8 weeks in group I was 36.8 and in group II was 30.5. At 12 weeks was 31.5 in group I and 30.2 in group II. The difference was significant (P< 0.05).

Graph I Comparison of VAS in both groups

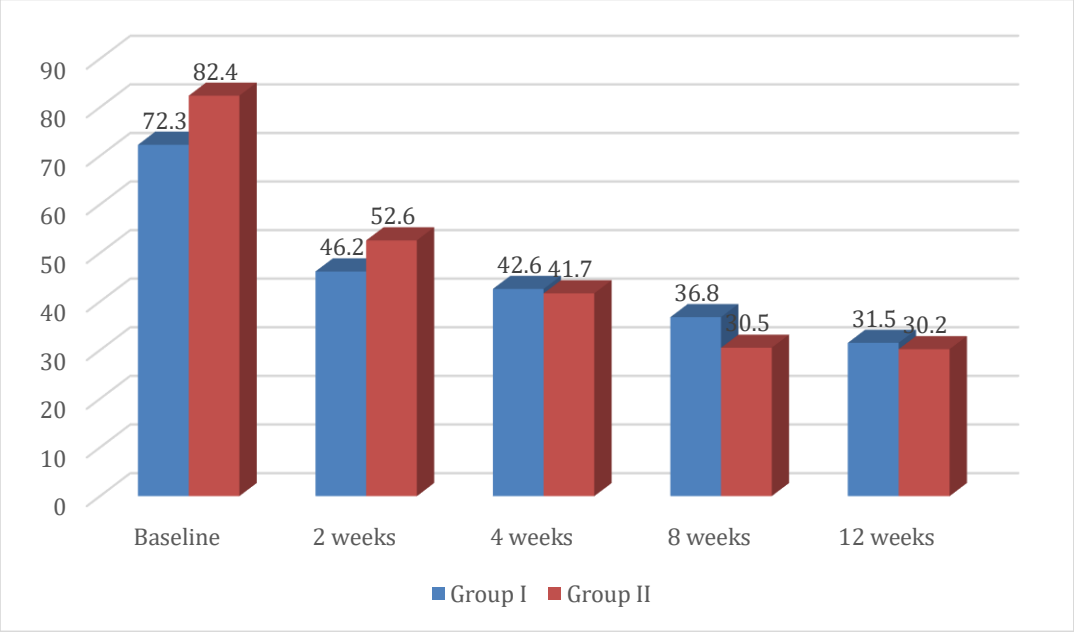

Table III Assessment of complications

Complications	Group I	Group II	P value
Nausea	5%	14%	0.01
Hallucinations	4%	12%	0.03
Hypertension	7%	2%	0.05
Tachycardia	3%	5%	0.81

Table III shows that common complications were nausea seen in 5% in group I and 14% in group II, hallucinations 4% in group I and 12% in group II, hypertension 7% in group I and 2% in group II and tachycardia 3% in group I and 5% in group II. The difference was significant (P< 0.05).

DISCUSSION

Chronic low back pain (LBP), a multifactorial and multidimensional problem with both sensory and emotional components, is challenging to manage. It is one of the leading causes of chronic pain.[8] The most frequent cause of LBP is intervertebral disc pathology, ranging from a ligamental tear to disc degeneration, herniation, protrusion and extrusion. Epidural steroid injection (ESI) acts by multiple mechanisms like anti-inflammatory, antinociceptive, decreased capillary permeability and reduced intra-neuronal oedema.[9]

Ketamine is a strong anesthetic and analgesic that is an NMDA receptor antagonist. In recent years, ketamine has been utilized in pain management more frequently and in more publications.[10] The treatment of serious depression and other mood disorders with ketamine is becoming more and more popular. Being a noncompetitive antagonist of the N-methyl-D-aspartate (NMDA) receptor is one of ketamine's most significant pharmacological characteristics.[11] It is thought that the analgesic activity of ketamine at subanaesthetic doses is predominantly caused by NMDA receptor antagonism in the brain and spinal cord. The NMDA receptor is critical for memory, synaptic plasticity, and learning.[12] The present study was conducted to assess the effectiveness of ketamine in chronic low back pain patients.

We found that the mean age in group I was 465.7 years and in group II was 46.2 years. The mean weight was 65.2 kgs in group I and 64.4 kgs in group II. The mean height was 155.2 cm in group I and 156.8 cm in group II. Khezri et al[13] in their study sixty patients scheduled for cesarean section under spinal anesthesia were divided into two groups to receive either bupivacaine 10 mg combined with 0.1 mg/kg ketamine, or bupivacaine 10 mg combined with 0.5 mL distilled water intrathecally. The time to the first analgesic request, analgesic requirement in the first 24 hours after surgery, onset times of sensory and motor blockades, the durations of sensory and motor blockades, and the incidences of adverse effects such as hypotension, ephedrine requirement, bradycardia, and hypoxemia, were recorded. Patients who received ketamine had a significantly prolonged duration of anesthesia compared with those who did not in the control group. The mean time to the first analgesic request was also significantly longer in ketamine group. The total analgesic consumption in the 24 hours following surgery significantly lessened in the ketamine group compared with that of the control group. The two groups did not differ significantly in intraoperative and postoperative side effects.

We observed that the mean VAS at baseline in group I was 72.3 and in group II was 82.4. At 2 weeks, in group I was 46.2 and in group II was 52.6, at 4 weeks in group I was 42.6 and in group II was 41.7, at 8 weeks in group I was 36.8 and in group II was 30.5. At 12 weeks was 31.5 in group I and 30.2 in group II. We found that common complications were nausea seen in 5% in group I and 14% in group II, hallucinations 4% in group I and 12% in group II, hypertension 7% in group I and 2% in group II and tachycardia 3% in group I and 5% in group II. Kathirvel S et al[14] studied 30 healthy female patients undergoing intracavitory brachytherapy applicator insertion for carcinoma of the cervix under spinal anaesthesia. Patients were randomly allocated to receive either intrathecal bupivacaine 10mg alone or bupivacaine 7.5mg combined with preservative-free ketamine 25mg. Spinal block onset, maximum sensory level, duration of blockade, haemodynamic variables, postoperative analgesic requirements and adverse events were recorded. Onset of sensory and motor block and duration of spinal analgesia were comparable between groups. Duration of motor blockade was shorter and requirement for intravenous fluids in the peri-operative period was less in the ketamine group. Significantly more patients in the ketamine group had adverse events, such as sedation, dizziness, nystagmus, ‘strange feelings’ and postoperative nausea and vomiting. Although the addition of ketamine to spinal bupivacaine had local anaesthetic sparing effects, it did not provide extended postoperative analgesia or decrease the postoperative analgesic requirements. Moreover, the central adverse effects of ketamine limit its spinal application.

The shortcoming of the study is the small sample size.

CONCLUSION

Authors found that when treating patients with chronic low back pain, ketamine at a dosage of 50 mg is more effective than 25 mg.

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