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MANAGEMENT OF NEUROPATHIC PAIN FOLLOWING SPINAL CORD INJURY: A CASE CONTROL STUDY

Medical Science

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ABSTRACT

Summary: Central neuropathic pain is a disabling condition physically as well as in spinal cord injury. Pregabalin and gabapentin and amitriptyline drugs have been tried alone and in combination with varying results. Pregabalin has resulted superiority over gabapentin in SCI neuropathic pain.

KEYWORDS

Neuropathic pain, pregabalin, gabapentin, VAS score, Spinal Cord injury

Introduction

International Association for the Study of Pain (IASP) has defined neuropathic pain as all pain initiated as caused by a primary lesion or dysfunction of the nervous system. Sensations in neuropathic pain are often multiple, like burning, gnawing, aching, shooting or lancinating qualities. Neuropathic pain with a sensory deficit and local autonomic dysfunction has invariable association.

Nociceptive and neuropathic pains are caused by different neurophysiological processes and therefore they respond to different modalities of treatment. Nociceptive pain is mediated by receptors on the delta and C fibres which are located in skin, bone, connective tissues muscles and viscera. Nociceptive pain usually responds to opioids and non-steroidal anti-inflammatory drugs (NSAIDS).

Neuropathic pain in contrast to nociceptive pain, is produced by damage to or pathological changes in the peripheral or central nervous system. So most neuropathic pain respond poorly to NSAIDS and opioid analgesics. The main stay of treatment are predominantly the tricyclic antidepressants (TCA's), the anti convulsants, serotonin and norepinephrine uptake inhibitors, tramadol.

Pregabalin is a novel, centrally acting neuromodulating agent that was approved by US FDA in 2004 for the treatment of painful diabetic neuropathy and post herpetic neuralgia. Pregabalin is also approved by the European Medicines Agency for the treatment of peripheral and central neuropathic pain in adults.

Gabapin and pregabalin bind to alpha 2 delta subunit of voltage dependent calcium channels and may modulate neurotransmitters (e.g Substance P, Glutamate) release from primary afferent terminals, via an action on interneurons in the dorsal horn of spinal cord.

Material and methods

A case controlled variable dose study of pregabalin in the treatment of neuropathic pain was conducted. Patients attending opd of Department of Physical Medicine and Rehabilitation of King George's Medical University, Lucknow and SIPS hospital Lucknow with the diagnosis of neuropathic pain were included in this study. Informed consent was taken from patients or their legally acceptable representative. Study was approved by IEC. Patients were divided into two groups, Group A – patients receiving pregabalin 75/ 150 mg daily. Group B- patients receiving Pregabalin more than 300 mg or upto 450 mg in divided doses.

Follow up was every 2 weeks interval after starting drug upto 8 weeks. During the first week patient was assessed by application of Visual Analogue scale and Quality of pain assessment scale.

Assessment parameters: Following parameters were assessed during the visit. Effectiveness parameters. Primary outcome measures- visual analogue scale (VAS) at first visit and follow up visits at 2, 4, 8 weeks.

Secondary outcome measures: Pain Quality Assessment Scale (PQAS) – it includes 20 criteria for assessing pain quality like burning, tingling, numbness, cramping, radiating nature of pain, activities of daily living. After calculating VAS score and total score in pain quality assessment scale at 0, 2, 4, 8 weeks visit of each patient statistical measures were applied.

Results

Total 20 patients were followed up among them 12 were male and 8 were females.(Table 1) Age range varied from 21 years to 64 years with mean age 52.6 years. Out of the 20 patients enrolled 12 were paraplegic and 8 were quadriplegic. Both groups were comparable in VAS score and PQAS scale at baseline visit.

There was significant difference in VAS score in paraplegics and quadriplegic patients in between 0 and 8 weeks but non-significant difference between 0 and 2 weeks. Response in VAS score and PQAS was significant in group B particularly quadriplegics at 8 weeks.
There was no adverse effect apart from drowsiness in some patients.

Discussion

Pregabalin can affect the pain quality very significantly as evidenced in this study. Response was significant at 8 weeks in quadriplegics. Pregabalin's increased binding affinity for the alpha 2 delta protein subunit of voltage gated calcium channel and more linear pharmacokinetics may be the reason for this difference.

Pregabalin exhibits linear pharmacokinetics after oral administration with low intersubject variability. This provides a more predictable dose response relationship. Pregabalin may provide additional pain relief and improvement in quality of life over a 8 weeks period.

Cost effectiveness analysis of pregabalin in the management of neuropathic pain due to diabetic polyneuropathy or post herpetic neuralgia has shown that pregabalin is more cost effective.

In spinal cord injury, central neuropathic pain is a disabling condition physically as well as emotionally. Over the years number of drugs have been tried but none of them has produced desired results.

Tricyclic antidepressants and anticonvulsants have been tried but response to the drug was average in the treatment protocol for central neuropathic pain following spinal cord injury. Amitriptyline exerts its effect in two ways inhibiting uptake of serotonin and nor epinephrine and degradation of endogenic opioids inhibition to make them more available to modulate pain messages and thus provides pain relief with antidepressant action.

Both amitriptyline and pregabalin produce some benefit when administered alone for central neuropathic pain in spinal cord injured patients but fails to provide a consistent and complete relief which is obtained by the combination of these drugs. Thus an overall

improvement in patient status can be expected with this combination in terms of pain relief, anxiolytic and antidepressant effect and improved sleep.

Because the pathophysiology of neuropathic pain encompasses all the biopsychosocial complexities of chronic pain, the best way to help patients is to adopt a systemic, stable, empathic, and above all, interdisciplinary approach that addresses all of the mechanisms. A consideration of nondrug and noninterventional should be foremost, as they demonstrate a favourable cost benefit ratio, and not an after thought.

Conclusion

Pregabalin has significant better result in reduction of pain quality and intensity in spinal cord injury patient for a long duration.

Conflict of interest: None

Table 1 : Gender distribution

Male	Female
16	4

Table 2 : Patient profile

Paraplegia	12
Quadriplegia	8

Table 3: Subject Distribution in Groups

	Paraplegia group No of cases :12	Quadriplegia group N = 8
Pregabalin 75mg	6	4
Pregabalin 150 mg in divided dose	4	2
Pregabalin 300 mg or more in divided dose	2	2

Table 4: Follow up

	0 week	2 week	4 week	8 week
VAS	7.30 ± 2.88	4.0 ± 2.0	2.30 ± 1.29	1.13 ± 1.01
PQAS	50	30	20	10

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