



# Chronic pain after spinal cord injury: a survey of practice in UK spinal injury units

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**Objective:** To determine current practice regarding assessment and management of patients with chronic pain after spinal cord injury (SCI) in the UK.

**Methods:** A postal questionnaire sent to the medical directors of the 12 spinal injury units in the UK.

**Results:** A response was received from nine of the 12 units. Chronic pain was felt to be a significant problem amongst patients with SCI, with inconsistent opinion between respondents regarding prevalence, aetiology and classification of chronic pain after spinal cord injury. Only one unit had established protocols for the investigation and management of pain, and most units felt that guidelines would be useful. Most felt that there was a need for further information on the subject.

**Conclusion:** Our survey has demonstrated the uncertainty that exists amongst specialists dealing with pain after SCI, and emphasised the need for more research into the problem.

**Keywords:** pain; spinal cord injury; dyesthesia; central pain

## Introduction

There is a widespread appreciation of the physical disability that accompanies injury to the spinal cord. However, it is less well recognised that a significant proportion of these patients suffer with chronic pain. The aetiology and characteristics of chronic pain after SCI are diverse. They include the pain associated with spasticity, accelerated degeneration of the musculoskeletal system, visceral dysfunction, syringomyelia and neurogenic pain.<sup>1</sup> Chronic pain can disrupt rehabilitation, inhibit work and social activity, necessitate hospital admission, and ultimately lead to depression.<sup>2</sup> It may prove extremely refractory to therapy. Review of the literature provides little guidance as to its effective management.

## Objective

To determine current practice regarding assessment and management of patients with chronic pain after spinal cord injury in the UK.

## Methods

A detailed questionnaire was sent to the medical directors of the 12 spinal injury units in the UK. This consisted of 70 direct questions requiring yes or no answers, seeking information on the assessment and management of chronic pain. An additional 6

questions required free hand response on prevalence and classification of chronic pain. These were as follows:

- 1 What is the population your spinal injuries unit serves (approximately)?
- 2 What would be an approximate figure for the incidence of SCI in your catchment area (new cases per million population per year)?
- 3 What would be an approximate figure for the prevalence of SCI in your catchment area (cases per million population)?
- 4 Approximately what proportion of your patients do you think suffer with some type of chronic pain? .....%  
.....%
- 5 Regarding the different types of chronic pain suffered by spinal injury patients, how do you personally classify the chronic pain that they suffer?
- 6 Which drug(s) do you find effective intrathecally in treating pain after SCI?

Response was encouraged with repeated circulation of the questionnaire and telephone contact. A time interval of 6 months was allowed for data collection.

## Results

We received responses from nine of the 12 units.

### Prevalence

The estimated prevalence of SCI ranged from 15–300 per million population (average 230 per million).

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Estimated prevalence of chronic pain after SCI ranged from 1–70% between units (average 34%). One factor that was considered to affect the prevalence of pain was the type of spinal injury, (Table 1), seven of the nine units recognised chronic pain as a major problem

**Table 1** Type of injury considered likely to be associated with chronic pain

Type of injury	Yes	No	N/A
Incomplete lesions	6	1	2
Complete lesions	3	5	1
Cervical injury	2	5	2
Thoracic injury	2	4	3
Lumbar injury	2	4	3
Cauda equina injury	5	2	2

(N/A—Not answered)

amongst their patients, with specific problems including disrupted rehabilitation and depression. Eight out of nine felt that once established, pain was unlikely to resolve spontaneously, could prove refractory to therapy, and in some cases constituted the patient's worst problem. All but two of the units had found it necessary to admit patients for pain control.

#### Classification and assessment

Units were asked how they classified pain after SCI. All respondents described their systems using a list of categories. In total 31 different categories were identified from the eight classification systems described. To allow some sort of comparison between systems, the categories provided by each unit have been grouped together, depending on which aspect of pain they appear to relate to, (Table 2). Classification was

**Table 2** Classification systems of pain after SCI in different units

Unit	Nature of Pain	Site of origin or proposed aetiology of pain	Severity of pain	Consequences of pain
1	*Centrally mediated dyesthesia *Hyperalgesic border reactions	*Centrally mediated dyesthesia *Hyperalgesic border reactions Deafferentation Dyaeesthetic	Phantom	
2	Hyperaesthetic Lancinating/radicular	Gastrointestinal		
3	*Perineal dyesthesia Hyperaesthesia	*Perineal dyesthesia Leg pains in those with flaccid lesions Hand pain Shoulder pain in tetraplegics		
4	Paraesthesia Odd sensations *Phantom sensations	Root pains Bony pain *Phantom sensations		
5		Neurogenic pain Root pain Phantom pain Physical pain (syringomyelia, arthritis) Functional pain		
6		Neuropathic central Neuropathic radicular Musculoskeletal		
7	Hyperaesthetic	Neurogenic	Ladder of analgesia (for severity)	Anxiety/depression score
8			No pain Minimal pain (no analgesia) Moderate pain (occ analgesia) Moderate pain (reg analgesia) Severe pain (reg analgesia)	Other features social behaviour, suicide

\*Categories appropriate to two groups are cited in both columns

based on personal observation in five cases and on literature findings in three cases. Six out of eight units felt it would be useful to have an internationally agreed taxonomy. Only one unit had protocols for the investigation of chronic pain in their patients. Five out of the nine respondents felt it would be useful to have guidelines for the investigation and management of chronic pain in their patients.

#### *Management*

Generally it was felt the issue of chronic pain was adequately addressed, although three units cited both lack of funding and lack of suitable expertise as reasons for shortcomings. A variety of treatment options had been used. Respondents were asked the treatments which in their experience they had found to be effective. (Tables 4 and 5). Of the units who had utilised intrathecal infusions, three out of four using morphine reported success; one suggested intrathecal alcohol to be effective, and the other failed to state which drugs they had used intrathecally. Other options that had been tried by single units included psychotherapy, diversional therapy and laser therapy. Only two respondents thought that starting some form of treatment immediately after injury might have an influence on the number of patients who develop chronic pain.

**Table 3** Table to show medical disciplines involved in the management of pain on spinal injuries units

Disciplines	Units
Consultant in spinal injuries	9
Clinical psychologist	9
Physiotherapist	9
Surgeon	6
'Consultant in pain'	4
Pharmacist	2
Consultant in palliative care	1
Alternative medicine specialist	1
Psychiatrist	1
Hypnotherapist	0

#### *Research*

Seven out of the nine units felt that there was a need for more information on chronic pain after SCI, and three units said they were presently conducting research on the subject.

#### **Discussion**

The prevalence estimates of 1–70% of SCI patients suffering chronic pain are in keeping with the wide variation quoted in the literature.<sup>3</sup> The reasons for this diversity are unclear, but may reflect inconsistencies in pain measurement and definition, patient reporting and consultant attitudes, as well as a genuine variation in prevalence.

In our study, patients with chronic pain were felt more likely to be those with incomplete lesions and injury to the cauda equina. We cannot say if this is based on respondents' personal experience or reflects their knowledge of previous studies which have suggested this.<sup>4,5,6</sup> Other investigators have disputed any association between type or level of injury, and the incidence of chronic pain.<sup>7,8</sup>

Our results highlight the lack of a specific taxonomy for pain after spinal cord injury. Pain has been classified differently by various units according to nature, site of origin or proposed aetiology, severity or consequence of pain. This inconsistency has been

**Table 4** Treatments tried for chronic pain, and their perceived efficacy

Treatment	Tried	Effective	Comments
Antidepressants	8	8	
Anticonvulsants	8	8	'High doses' – 1 respondent
Opiates	7	5	
Non steroidal anti-inflammatory	7	3	
Ketamine	1	1	
Muscle relaxants	1	1	'in combination with other things'
Benzodiazepines	1	N/A	
Topical non steriodals	1	N/A	

N/A – Not answered

**Table 5** Procedures tried for chronic pain, and their perceived efficacy

Procedure	Tried	Effective	Comments
Dorsal root entry zone procedures (DREZ)	6	4	'sometimes effective' – 1 respondent
Dorsal column stimulators	4	4	'1 case only'
Transcutaneous nerve stimulation (TENS)	8	7	'sometimes effective' – 2 respondents
Acupuncture	5	4	'sometimes effective' – 2 respondents
Corpectomy	0	0	
Anterolateral cordotomy	0	0	
Intrathecal infusions	6	4	

noted by others, who have suggested it hampers effective communication of information, and may be the major stumbling block to advances in the understanding and management of pain after SCI.<sup>1</sup> An International Association for the Study of Pain (IASP) working group has been created to address this issue.

Regarding the treatment of pain after SCI, most of the published work concerns neurogenic pain, and consists of case reports or small, retrospective studies that have not been repeated to determine validity.<sup>9,10,11</sup> For this survey, we did not ask respondents to state what type of pain particular treatments had been used for. Consistency in classification amongst workers is needed before this information can be obtained. However, the general pattern of treatments used reflects practice in other areas of chronic pain work, with antidepressants, anticonvulsants and TENS being widely used; and to a lesser extent opioids, non steroidal antiinflammatory drugs and acupuncture. Invasive techniques such as dorsal column stimulation find less favour, probably due to the extra resources needed, and their unproven benefit.<sup>12</sup>

Results suggest that in the UK, cordectomy and anterolateral cordotomy are now rarely used for the management of pain after SCI. The DREZ procedure, compared to other destroying operations on the spinal cord, seems to be the only method that is still acknowledged. Exponents of this relatively new technique suggest it to be most effective for pain limited to one or two dermatomes around the lesion area.<sup>13</sup>

Interestingly, only two respondents thought that treatment measures started immediately after injury might influence the number of patients who subsequently experience pain. This question was asked in light of recent experimental evidence to suggest that the hypersensitivity induced by an ischaemic SCI can be reduced by preemptive administration of an NMDA antagonist.<sup>14</sup>

In the management of chronic pain in their patients, only four of the units involved a pain specialist. We can only presume that in the other units, responsibility for this task lies with those who have different clinical priorities and for the most part limited training in chronic pain work.

Extra funding and facilities required to address this issue might be offset by a reduction in resources presently spent on prolonged rehabilitation, inappropriate treatments and admitting patients for pain control.

## Conclusion

We acknowledge the fact that this study has limitations. It is a postal survey, confined to the UK, and the limited number of respondents combined with incomplete answering negates statistical analysis. In addition, the information is based on the perception of

those questioned and may not be fact, especially concerning issues such as pain prevalence and treatment efficacy. Nevertheless, the survey has demonstrated the uncertainty that exists amongst specialists dealing with pain after SCI, and emphasized the desire for more information. Compared to other groups, patients with SCI provide a good cohort for research. They are often young and otherwise healthy, and information regarding the timing and extent of their injury is readily available. Today we seem no nearer to understanding and effectively treating pain after SCI, than those who commented on the need for greater research into it over 30 years ago.<sup>15</sup>

Hopefully, new experimental models may help in our understanding of the pathophysiology involved,<sup>16</sup> and a definitive classification system will enable more accurate transmission of information.

## References

- 1 Siddall PJ, Taylor DA, Cousins MJ. Classification of pain following spinal cord injury. *Spinal Cord* 1997; **35**: 69–75.
- 2 Cairns DM, Adkins RH, Scott MD. Pain and depression in acute spinal cord injury: Origins of chronic problematic pain? *Arch Phys Med Rehabil* 1996; **77**: 329–335.
- 3 Bonica JJ. Introduction: Semantic, Epidemiologic, and Educational issues. In: Casey KL (ed). *Pain and Central Nervous System Disease: The Central Pain Syndromes*. Raven Press Ltd. New York, 1991, pp. 13–29.
- 4 Botterell EH, Callaghan JC, Jousse AT. Pain in Paraplegia: Clinical management and surgical treatment. *Proc R Soc Med* 1953; **47**: 281–288.
- 5 Davidoff G et al. Function limiting dysesthetic pain syndrome among traumatic spinal cord injury patients: a cross sectional study. *Pain* 1987; **29**: 39–48.
- 6 Beric A. Post spinal cord injury pain states. *Pain* 1997; **72**: 295–298.
- 7 Anke AJ, Stenehjem AE, Stanghell JK. Pain and life quality within 2 years of spinal cord injury. *Paraplegia* 1995; **33**: 555–559.
- 8 Stormer S et al. Chronic pain/dysesthesia in spinal cord injury patients: results of a multicentre study. *Spinal Cord* 1997; **35**: 446–455.
- 9 Fibso JC, White Jr. LE. Denervation Hyperpathia: a convulsive syndrome of the spinal cord responsive to carbamazepine therapy. *J Neurosurgery* 1971; **35**: 287–290.
- 10 Sandford PR, Lindblom LB, Haddox JD. Amitriptyline and carbamazepine in the treatment of dysesthetic pain in spinal cord injury. *Arch Phys Med Rehabil* 1992; **73**: 300–301.
- 11 Banerjee T. Transcutaneous Nerve stimulation for pain after spinal injury. *New Eng J Med* 1974; **291**: 796.
- 12 Cole JD, Illis LS, Sedgwick EM. Intractable central pain in spinal cord injury is not relieved by spinal cord stimulation. *Paraplegia* 1991; **29**: 167–172.
- 13 Friedman AH, Nashold BS. DREZ lesions for the relief of pain related to spinal cord injury. *J Neurosurg* 1986; **65**: 465–469.
- 14 Hao JX et al. The excitatory amino acid receptor antagonist MK-801 prevents the hypersensitivity induced by spinal cord ischaemic in the rat. *Exp Neurol* 1991; **113**: 182–191.
- 15 Kaplan LI, Grynpaum BB, Lloyd KE, Rusk HA. Pain and spasticity in patients with spinal cord dysfunction; results of a follow up study. *JAMA* 1962; **182**: 918–925.
- 16 Yezierski RP. Pain following spinal cord injury: the clinical problem and experimental studies. *Pain* 1996; **68**: 185–194.