

ton of People With SCI

By Steven Kirshblum, MD, and Kevin O'Connor, MD

C.K. is a 37-year-old male with a history of C7 complete quadriplegia following a football accident 18 years ago. He was referred to the pain clinic at Kessler Institute for Rehabilitation with a two-year history of upper-extremity neuropathic pain. Although he had tried multiple medications, including acetaminophen, ibuprofen, amitriptyline and narcotics, his pain was progressing.

On examination, he had minimal spasticity, full range of motion and a sensory level of C6 to pinprick and light touch. A strength exam revealed elbow flexors (C6) bilaterally 4/5 and wrist 2+/5. His skin was intact.

Preliminary clinical diagnosis was of post-traumatic syringomyelia because of the presumed ascending motor and sensory level with progressive pain. An MRI of the cervical spine demonstrated a C5 to C8 syrinx, which was treated neurosurgically with excellent relief of pain.

Chronic pain is a common complaint among people with spinal cord injury and may be a severely disabling sequela following such an injury. Estimates of the prevalence of chronic pain—a continuing or disabling disorder lasting more than six months—ranges from 5 percent to 77 percent in this population. Chronic pain can interfere with performing activities of daily living, and 50 percent of people with it report sleep disturbances. Chronic pain has also been related to depression, and relief of the pain often has a significant effect on reducing depression.

Although there is a significant lack of literature on chronic pain in SCI, it must be recognized that spinal cord injured people experience the difficulties associated with chronic pain in addition to the functional impairment of their injury. This may have a dramatic effect on their functional independence, including transferring, mobility, activities of daily living and productivity, decreasing their overall quality of life. This article gives a general review of chronic pain syndrome following spinal cord injury and its treatment.

Classification of Pain

There are a variety of classification systems for the various pain syndromes asso-

ciated with SCI. Britell and Mariano classify these pain syndromes into three etiological groups:

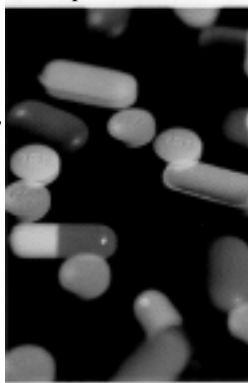
1. **Mechanical**
2. **Radicular**
3. **Dysesthetic (central)**

Mechanical Pain

Mechanical pain has its onset weeks to months after an injury and is described as dull or aching in quality. The duration is variable, and the pain characteristically worsens with activity and improves with rest. The pain often localizes to the site of the injury and may be from musculotendinous or osseous structures. Mechanical pain may be from overuse syndromes involving the shoulder, elbow and wrist and includes rotator-cuff tears, rotator-cuff impingement, osteoarthritis, osteonecrosis, capsular contracture, capsulitis and carpal tunnel syndrome.

Radicular Pain

Radicular pain is associated with injury to the peripheral nerve. The onset of pain is within days to weeks after an injury and is described as a burning or stabbing quality that often improves with activity or worsens with rest. The pain is often variable and



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may radiate in a dermatomal pattern. It may vary with position or movement or may be unrelated to mechanical factors. Finally, it is often localized to within two or three spinal segments of the zone of injury and includes pain associated with cauda equina syndrome.

Dysesthetic (Central) Pain

Central pain has an onset of weeks to months after an injury. This pain is usually constant and is often characterized as a burning, aching or tingling sensation perceived in the generalized area below the level of the lesion. The mechanism of this pain is not completely understood, although it may be from post-injury alterations in neurotransmitters or hypersensitivity of structures involved in pain perception. It is extremely important to consider a syrinx as the cause of late-onset pain, especially if the pain is progressive, as it may cause progressive neurological deficits if left untreated.

Assessment of Pain

Assessment of the SCI client with chronic pain includes taking a thorough history to evaluate the characteristics of the pain. Factors that have been found to influence pain include activity level, depression and lack of social support. Medical stability and functional disturbances of organ systems, including spasticity, constipation, urinary tract infection, pressure sores and posture, may all increase pain. Many medications, both prescription and nonprescription, including alcohol, herbs and nicotine, can further exacerbate the pain. In addition, psychological, social and cultural factors are all important considerations in the client's response to pain.

The physical examination should include a comprehensive neuromuscular evaluation for skin lesions, joint problems, tone, flexibility, strength, sensory testing, reflexes and contractures. A complete functional assessment should also be performed, including sitting posture, techniques of transfer training and weight shifts, and wheelchair propulsion and management.

Currently, the McGill-Melzack Pain Questionnaire is the instrument of choice for assessment of pain, as it has been shown to provide a comprehensive assessment for the types of pain associated with spinal cord injury. For mechanical pain, the Wheelchair Users Shoulder Pain Index was designed to measure shoulder pain and its functional effects in people who use wheelchairs. It is useful both clinically and for research purposes to detect and monitor shoulder pain and accompanying loss of function.

Diagnostic testing, including radiological (i.e., X-rays, CT scans and MRI tests), blood tests and electrophysiologic tests (nerve conduction studies and EMG), may be considered after an initial assessment and to rule out specific disorders. If a syrinx is suspected based on history and physical examination, an MRI is the diagnostic modality of choice.

Treatment of Chronic Pain in SCI

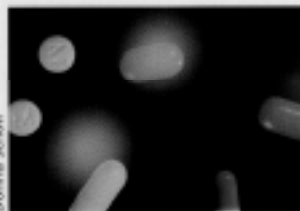
The treatment of chronic pain in people with SCI varies by the type and cause of pain. However, in many clients, the specific etiology cannot be found. Overall, the key components to the treatment include minimizing the pain, dealing with the secondary disabilities and preventing pain from recurring. All factors that impact on the pain should be minimized before initiating pharmacologic treatment.

For mechanical pain, treatment includes resting the overused joint and decreasing stresses by teaching compensatory techniques. Rest is often difficult because the person with SCI requires the use of his or her upper-extremity joints for all functional activities. However, evaluating the client's techniques in various activities can be helpful in finding the cause of the pain. This also poses the opportunity for the rehab professional to teach better techniques for such activities. The person with SCI should limit overhead activities and use a transfer board rather than relying on lateral pickup transfers. The use of anterior weight shifts rather than push-up relief will also decrease stress in the shoulders.

It is also important to make sure the wheelchair is the proper size, so the client's shoulders are not overly abducted. The greater the degree of abduction, the greater the incidence of compression of rotator-cuff musculature. A power wheelchair may be needed to minimize the use of the upper extremities to allow pain-free mobility.

For dysesthetic/central pain, various classes of medications have been trialed with limited success. All medications should be monitored regularly by a physician and should be given not on an as-needed schedule, but at regular intervals. Some of the medications that may be used include

anticonvulsive agents (carbamazepine, Neurontin, Dilantin), minor tranquilizers (Klonopin, diazepam), tricyclic antidepressants (amitriptyline, nortriptyline, imipramine),



rhythmics (mexiletine), alpha-adrenergic agents (phenoxybenzamine), antispasticity agents (baclofen) and narcotics. Some medications, such as mexiletine and valproate, have recently been found to be ineffective for pain, and many others have had indeterminate trials in the treatment of chronic pain.

Electrical stimulation has been used as an adjunct to pharmacologic management. This may include transcutaneous electrical nerve stimulation, dorsal column stimulation and functional electrical stimulation. Other adjuncts that have been reported include relaxation training, self-hypnosis, biofeedback and conventional psychotherapy.

Surgical procedures for chronic pain include dorsal-root entry-zonemicrocoagulation and implantation of intrathecal morphine pumps, although these are not performed with other interventions nor have they been explored fully.

Conclusion

Chronic pain is common and often has a significant impact on the lives of those affected by SCI. The pathophysiology of chronic pain is not well understood, and the etiology is often

undetermined. This lack of understanding necessitates a multimodal treatment strategy, which often has mixed results.

As with all chronic pain, a multidisciplinary approach, including modalities, medications, psychological counseling and other therapies, is the most effective strategy to help SCI clients with chronic pain.

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