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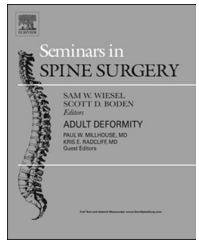

Nonoperative management of cervical disc herniations: An evidence-based approach

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ABSTRACT

This article aims to review the available evidence in support of the various nonoperative treatment options for cervical disc herniations. There is a lack of evidence to support most medications, modalities, and acupuncture. There is good evidence to support the use of anticonvulsants and antidepressants for the treatment of neuropathic pain that can be related to cervical disc herniations. Physical therapy and manual therapy have been shown to help improve acute and chronic neck pain. Cervical epidural steroid injections, using an interlaminar approach, have been shown to provide short and long-term relief in pain related to cervical disc herniation.

1. Introduction

Cervical disc herniations are a common cause of neck pain and disability. The initial management of neck pain with or without radiculopathy caused by a cervical disc herniation is usually non-surgical. There are numerous conservative care options to consider with various degrees of scientific evidence to support their use. One major challenge in examining the available literature on neck pain is that the diagnosis of a cervical disc herniation is often not made clear. In addition, the conservative treatment of neck and low back pain is very similar, but there is much more literature assessing nonoperative treatment options for low back pain. Assuming there are no signs of myelopathy or a progressive neurological deficit on exam, most patients and clinicians will choose a combination of conservative care options before considering surgical intervention. The severity of pain and impairment on function may dictate the need for stronger medications and interventional procedures.

2. Pharmacotherapy

The initial management of neck or arm pain caused by a cervical disc herniation involves the use of medications for symptom relief. Although the role of pharmacotherapy in the management of cervical disc herniations has been inadequately addressed in the literature, various medications are widely used in both the acute and chronic states. The options include non-steroidal anti-inflammatory drugs (NSAIDs), acetaminophen, oral corticosteroids, muscle relaxants, anticonvulsants, antidepressants, topical agents, and opioids. The widespread use of these medications necessitates an in-depth look into each drug classes.

3. NSAIDs

Although no standard treatment regimen exists for cervical disc herniations, many physicians consider NSAIDs the first-line agents in the treatment of neck pain. The goal is to provide adequate pain relief in order to foster participation in a rehabilitation program.[1] Treatment strategies include use of NSAIDs for several weeks as needed for pain relief. Although there is no evidence for their use specifically in the treatment of cervical disc herniations, NSAIDs have been shown to be effective in treating low back pain. A Cochrane review looked at 65 trials, of which close to half were considered high quality, where NSAIDs were found to be effective for short- and

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long-term relief in acute and chronic low back pain.[2] No similar study has been done for neck pain.

NSAIDs inhibit both cyclooxygenase 1 and 2 (COX-1 and COX-2) thereby preventing the synthesis of prostaglandins and thromboxanes, which have been implicated in the pain response in cervical radiculopathy.[3] It is believed that the selective inhibition of COX-2 provides both anti-inflammatory and analgesic effects while minimizing deleterious effects on the gastrointestinal tract. Celecoxib (Celebrex) is a selective COX-2 inhibitor that may be used in patients at risk for peptic ulcers and has been shown to have less gastrointestinal toxicity.[4] Although a patient's response to various NSAIDs may be different, there is good evidence that there is no difference in efficacy within the drug class.[5] Regardless of the NSAID used, patients on long-term treatment should be monitored for kidney, liver, and gastrointestinal toxicity. Clinicians may consider prescribing an H2 blocker or proton pump inhibitor (PPI) in conjunction with an NSAID in patients with gastrointestinal side effects. Caution should also be used in patients with cardiovascular disease, as NSAIDs have been associated with an increased relative risk of stroke and myocardial infarction.[6,7]

Acetaminophen is a mild analgesic medication that is not typically classified as an NSAID but does exhibit weak anti-inflammatory properties. There is no good evidence to support its use in neck pain related to cervical disc herniation, however, it is a commonly used alternative to over the counter NSAIDs and does not cause gastrointestinal irritation. Caution should be taken when prescribing acetaminophen as it can cause liver toxicity and overdoses can be fatal. Dosages should not exceed 3000 mg a day and are taken in divided doses approximately every 6–8 h. It is important to inform patients that acetaminophen is often found in combination with other narcotic medications (oxycodone and hydrocodone) as well as over the counter cold medications.

4. Muscle relaxants

Muscle relaxants refer to a group of medications, with different mechanisms of action, which alter muscle tone and function. Spasms occur as a result of increased tension at muscle insertion sites causing a buildup of anaerobic byproducts. Muscle relaxants are often used in patients with muscle spasms, muscle pain, and stiffness.[8] They reduce pain and local tenderness and can help increase range of motion. A common sideeffect is somnolence. This may be limiting to some patients but useful in patients with disturbed sleep secondary to painful musculoskeletal conditions. Bornstein and Korn[8] performed two randomized control trials with over 1000 patients of which one-third were patients with acute spasms in the cervical region. They found that cyclobenzaprine 5 and 10 mg three times a day (TID) had significantly higher patient rated impression of change of symptoms, medication helpfulness and relief from neck pain. Additionally, they found that 5 mg dosing was as effective as 10 mg dosing with less sedation.

The criticism of many studies looking at this class of drugs is poor methodology. Despite the lack of good-quality studies, some evidence indicates non-benzodiazepine muscle relaxants are moderately effective in providing short-term relief of up to 2 weeks.[8] Daytime sedation can be very limiting for some patients. Methocarbamol and metaxalone are often used as less sedating alternatives, but there is limited evidence of their effectiveness.[9,10] Although muscle relaxants are used for acute and chronic management of patients with cervical disc herniation, there is no evidence in the literature that shows that they alter the natural history. However, there is evidence that shows the combination of NSAIDs with muscle relaxants is better than an NSAID alone at improving pain relief in acute low back pain with muscles spasms.[11]

5. Anticonvulsants and antidepressants

Anticonvulsants such as gabapentin and antidepressants such as tricyclics and selective serotonin–norepinephrine-reuptake inhibitors (SSNRIs) are commonly used to treat chronic neuropathic pain syndromes. They are also used in patients who have cervical radicular pain. There is no evidence in the literature that addresses their use in the treatment of symptomatic cervical disc herniations. There is some evidence to suggest that tricyclic and serotonergic antidepressants have an analgesic effect independent of their antidepressant properties and reduce chronic pain.[12] It was found that serotonin-containing neurons in the raphe nuclei send descending fibers to the gray matter at all levels of the spinal cord.[13,14] Furthermore, the analgesic effect of morphine and electrical stimulation on the raphe nuclei was hampered by a serotonin antagonist P-chlorophenylalanine.[15] These findings suggest serotonin acts on descending pathways exerting its nociceptive effect.

Duloxetine (Cymbalta), an SSNRI, is FDA approved for major depressive disorder, neuropathic pain associated with diabetic peripheral neuropathy, generalized anxiety disorder, fibromyalgia, and chronic musculoskeletal pain. A recent systematic review and meta-analysis on pharmacotherapy for neuropathic pain found strong recommendations for the use of tricyclic antidepressants, serotonin–noradrenaline reuptake inhibitors, gabapentin (Neurontin), and pregabalin (Lyrica) as first-line agents in the treatment of neuropathic pain.[16] Common side effects include sleepiness, dizziness, headaches, depression, weight gain, and lower extremity edema.

6. Oral corticosteroids

Oral corticosteroids are commonly used in the setting of acute neck pain with or without radiculopathy from a cervical herniated disc. They are often prescribed as a Medrol dosepak or tapering dose of prednisone over 6–12 days. In one study, 13 out of 22 patients whose pain was inadequately treated for 6–10 weeks with a combination of NSAIDS, manual/mechanical traction and strengthening exercises got relief from a single week of oral steroid taper.[1] A recent case series of patients with cervical disc herniation with neck and radicular arm pain that failed NSAIDs and anticonvulsant therapy showed significant improvement with oral mini-pulse therapy (i.e., tapering the dose of betamethasone over 16 days).[17]