The Effectiveness of Tricyclic Antidepressants on Lumbar Spinal Stenosis

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Abstract

Tricyclic antidepressants have not been explicitly studied in the conservative treatment of lumbar spinal stenosis. A retrospective chart review was conducted in a subset of patients with chronic low back pain and lumbar spinal stenosis managed with low dose tricyclic antidepressants. Of 26 patients, 20 reported improvement in back pain. The majority of patients reported improvement with an initial dose of 10 mg of either amitriptyline or nortriptyline and remained on this dose. Patients with both leg and back pain reported improvement in greater proportion than patients with back pain alone. According to this study tricyclic antidepressants appear to be effective in controlling lumbar spinal stenosis symptoms in this patient population. Tricyclic antidepressants need to be further analyzed in randomized controlled studies as a means to conservatively manage lumbar spinal stenosis with stratification based on location of pain.

Tricyclic antidepressants (TCAs) have been recommended for treatment of low back pain, but specific studies in lumbar spinal stenosis are lacking. The prevalence of lumbar spinal stenosis in primary care patients is about 3%. The natural history of lumbar spinal stenosis has been described as a chronic course over years without rapid deterioration of clinical or functional statuses. Trials comparing surgical versus conservative treatment for lumbar spinal stenosis have proven the benefit of surgery in the short-term, with the tendency of symptoms to recur. If an initial conservative approach is chosen, surgery can be done later with good results.

Recent papers suggest that acetaminophen and nonsteroidal antiinflammatories (NSAIDs) are the drugs of choice for the conservative treatment of lumbar spinal stenosis. However, the side effects of these agents make their use problematic. One of the authors (JM) has noticed improvement in spinal stenosis symptoms with the use of TCAs. The current study was undertaken to confirm this anecdotal experience.

Materials and Methods

This study is a retrospective chart review. The intervention is standard of care, as TCAs are an option in the algorithm to manage subacute or chronic lower back pain. We retrospectively analyzed data in the subgroup of patients with lumbar spinal stenosis. The study was reviewed by the LifeBridge Health Institutional Review Board and was granted exempt status.

The computerized database of an outpatient rheumatology practice in a university affiliated teaching program was searched for a diagnosis of lumbar spinal stenosis; 110 charts of patients who were diagnosed with lumbar spinal stenosis from 2005 to 2008 were reviewed. Patients who had previous spinal surgery or epidural steroid injections and patients with concomitant depression or fibromyalgia were excluded. Thirty patients were lost to follow-up. The results of our study are based on the remaining 26 patients. This patient population consisted of 23 females and three males. The median age was 63 years, with a patient range of 39 to 87 years.

In all of the patients, an attempt was made to achieve follow-up data. Pain scores, the Modified Health Assessment Questionnaire (MHAQ), and fatigue and global assessment scores were collected prior to intervention. In those patients...
who improved and did not need follow-up visits, this data could not be collected.

Lumbar spinal stenosis was diagnosed clinically by the presence of typical symptoms of neurogenic claudication. Neurogenic claudication was defined by pain with walking or standing, relieved by maneuvers of spinal flexion such as sitting and leaning over a sink or over a grocery cart. All patients had positive answers to the classic questions for spinal stenosis described above; 15 patients had confirmatory MRI studies as well. Pain with standing that is relieved by sitting is known to have a specificity of 93% for lumbar spinal stenosis, while imaging studies are highly sensitive but specificity is unknown.

TCAs were used at starting doses lower than those recommended in other studies, due to concern for side effects in this patient population. Either amitriptyline or nortriptyline were started at 10 mg once daily in the evening. Nortriptyline was selected for patients with sicca symptoms. The dose was increased weekly by 10 mg until the patient was satisfied with the level of pain control or side effects were noticed. The assessment of response to treatment and adjustments of dose were based on reports of self-made pain in the follow-up visit or phone call. A statistical program trademarked by the CDC (Centers for Disease Control and Prevention, Atlanta, Georgia), Epi Info™ software, version 3.4.3, was used for statistical analysis.

Results

Of 26 patients on TCAs, 20 reported improvement in back pain and six reported no benefit. The TCA dose in patients with clinical improvement ranged from 10 mg to 100 mg. More than half (11, 55%) of the patients who reported clinical improvement stayed on the initial dose of 10 mg daily of either amitriptyline or nortriptyline, with good results. We had two patients (10%) on 20 mg TCA daily, two patients (10%) on 30 mg TCA daily, three patients (15%) on 40 mg TCA daily, one patient (5%) on 50 mg TCA daily, and one patient (5%) on 100 mg TCA daily (Fig. 1). In the six patients who reported no improvement, TCAs were discontinued after three to four follow-up visits or phone calls.

TCAs were well tolerated and no significant side effects occurred at these doses. There appears to be a difference in efficacy, based on symptoms on the initial presentation. Twelve of 13 patients with both leg and back pain (92.3%) and seven of nine patients with leg pain alone (77.8%) reported improvement on TCAs, compared to one of three patients with back pain alone (33%) (Fig. 2).

Discussion

Based on a number of studies, TCAs provide mild to moderate benefit in chronic low back pain, and there is conflicting evidence whether they improve functional status. TCAs are included in current recommendations for the conservative treatment of subacute or chronic low back pain. TCAs doses proven to have analgesic effects in low back pain or neuropathic pain are in the range of 50 mg to 150 mg/day. Starting doses recommended in geriatric patients are in the range of 10 mg to 25 mg/day in the evening. Starting doses recommended in geriatric patients are 50 mg/day in divided doses for amitriptyline hydrochloride and 30 mg to 50 mg/day in single or divided doses for nortriptyline hydrochloride. In our study, a starting dose of 10 mg was used, and dose adjustments were made on an individual basis.

TCAs have not been explicitly studied in the conservative treatment of lumbar spinal stenosis. Pharmacologic treatment options mentioned in the medical literature for lumbar spinal stenosis symptoms are acetaminophen, NSAIDs, cyclooxygenase-2 inhibitors, opioids, lumbar epidural steroid injections, and gabapentin. None of these treatment options have been consistently validated in studies, and there are a limited number of trials.

According to this study, TCAs appear to be effective in controlling lumbar spinal stenosis symptoms (neurogenic

![Figure 1](image1.png) **Figure 1** Percentage of patients with symptom control on different TCA doses.

![Figure 2](image2.png) **Figure 2** Effectiveness of treatment based on symptoms on presentation.
claudication and back and leg pain) in this patient population. The effect appears to correlate with the symptoms on the initial presentation, as TCAs tend to be more effective in patients with both back pain and leg pain than in patients with back pain alone. No major side effects were observed at these doses. TCAs need to be further analyzed in randomized controlled trials as a means to conservatively manage lumbar spinal stenosis with stratification based on location of pain.

Disclosure Statement
None of the authors have a financial or proprietary interest in the subject matter or materials discussed, including, but not limited to, employment, consultancies, stock ownership, honoraria, and paid expert testimony.

References