Psychiatric and Psychologic Issues in NTOS

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Abstract

People with chronic pain are more likely than those without to have concomitant problems with depression, anxiety, and substance misuse. Such problems can add to the negative impact of NTOS on quality of life and greatly complicate the clinical picture. Many patients find themselves in a vicious cycle of chronic pain, emotional distress, and physical and social dysfunction. The optimal treatment approach for these patients should thus be carried out within the interdisciplinary model of chronic pain management with mental health professionals fully involved. Psychotherapeutic treatment approaches have been developed and empirically demonstrated to improve mood, function, and overall quality of life in patients with chronic pain.

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Critical Take-Home Messages

1. Mental health is often negatively impacted by NTOS.
2. Depression and anxiety can, in turn, complicate the clinical picture.
3. Mental health practitioners should be included on the interdisciplinary NTOS treatment team.
4. Specialized psychotherapeutic techniques have been shown to decrease suffering and improve functioning.
5. Certain psychotropic medications can improve both emotional functioning and pain.

20.1 Introduction

People who develop chronic pain see their lives change in a myriad of ways. Unremitting physical pain is often accompanied by significant deficits in physical function, a decrease in income and financial security, and unwelcome alterations in family and social relationships. All of these changes can conspire to negatively impact mental well-being and overall quality of life, thus complicating the needs of the patient as well as the demands placed on healthcare providers. People with neurogenic thoracic outlet syndrome (NTOS) represent a special case of this complex situation, given the added problems of loss of function of arms and hands as well as the often long and distressing road to accurate diagnosis

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and appropriate treatment. The role of mental health professionals on the interdisciplinary team is therefore key to fully addressing the bigger picture of NTOS and its many unfortunate ramifications.

20.2 The Impact of NTOS on Mental Health

Individuals with NTOS are at risk for developing mood difficulties such as depression. Due to the loss of functionality in their arms and hands and the pain they may experience, individuals with TOS are often unable to perform many of the important roles or daily activities that they have been accustomed to doing, such as working, taking care of their home, caring for their family, sports, exercise, or other leisure activities. Because of this, they may experience threats to their identity, leading to feeling down, having difficulty enjoying activities, and feeling worthless. Catastrophic worry and negative emotions are overlapping processes that are often present in both chronic pain and depression, and can contribute to the maintenance of these chronic conditions. In general, depression is noted to increase the probability of developing long-term pain difficulties and disability [1]. Also critical are two common and related issues: Many patients with NTOS do not receive this diagnosis until many physicians have been seen and months or years have passed, and many patients with NTOS are initially labelled as having no organic problem—they are told "it's all in your head." Thus, psychologists and mental health professionals play a key role in helping patients adjust to the changes they experience and improve their functioning through treatment of their mood and emotional responses.

Anxiety may also be a problem with NTOS patients. A community-based study of over 5000 adults found that those people with chronic pain at any site were more than twice as likely to have a diagnosed anxiety disorder compared to those without chronic pain [2]. That relationship appears to be bidirectional, in that individuals with chronic pain are more likely than those without chronic pain to develop an anxiety disorder, and individuals with a pre-existing anxiety disorder are more prone to develop chronic pain than those without an anxiety disorder [3, 4]. This complex relationship is further supported by neuroimaging studies showing that certain areas of the brain are activated by both chronic pain and anxiety [3]. In addition, emotional and motivational factors may act to perpetuate the vicious cycle of anxiety and chronic pain [4]. For example, the "fear-avoidance model" posits that the fear of pain can cause avoidance of a variety of physical activities, which can then lead to deconditioning, invalidity, and further emotional distress [5]. In a study of 183 patients with NTOS, those patients who held extreme and catastrophic beliefs about their pain had greater levels of functional disability [6]. The combination of chronic pain and anxiety can complicate the clinical picture and thus require an interdisciplinary treatment approach in order to achieve optimal results. In addition to clinical depression and anxiety, chronic pain can obviously impact overall quality of life. And, when compared to patients with other forms of peripheral nerve injuries, TOS patients reported a significantly greater negative impact on quality of life [7].

Problematic substance use—including both misuse of prescribed medications and concomitant use of illicit drugs—can also become a complicating factor in patients with chronic pain. For example, it has been found that as many as half of patients who have been prescribed opioid medications have used them in a manner other than how they were prescribed. Occasional misuse that does not significantly depart from recommendations may be relatively inconsequential. However, a regular pattern of opioid misuse can lead to potential health problems as well as unintentional overdose [8], and unintentional opioid overdose deaths are most likely to occur when those medications are taken in combination with sedatives, alcohol, or illicit drugs [9]. Repeated misuse of opioids appears to be much more common than frank addiction, affecting as many as one in four patients taking opioids for chronic pain [10]. Opioid misuse is much more likely to develop among males, younger patients, and

those with a personal or family history of substance use problems. Patients who are prone to negative affect or emotional distress are also more likely to misuse opioids, perhaps as a means of "chemical coping" [11].

20.3 Treatment Considerations

The most effective treatment of NTOS should take into account the complexity of its impact on patients' physical, psychological, and social functioning. Hence, the treatment of NTOS is now best carried out within the biopsychosocial model of chronic pain which has—over the past few decades—slowly supplanted the once prevailing biomedical model [12]. Pain psychologists play an important role on the interdisciplinary chronic pain management team, which is to help patients regain or improve functioning in domains of their life that have been negatively affected by NTOS [13, 14]. A number of psychotherapeutic strategies have been developed and are often combined and tailored to best meets the needs of the individual patient.

Chronic Pain Self-Management: At the core of the biopsychosocial approach is the notion that patients form collaborative partnerships with their providers for the purpose of learning more effective skills for managing the whole chronic pain experience. Patients thus take more responsibility for their care on a day-to-day basis while periodically being tutored and coached by their provider. The umbrella term "self-management" covers such areas as chronic pain education, pacing daily activities, regular but moderate exercise, healthy eating, and communication skills [15]. There are also a variety of "self-help" books on managing chronic pain that providers may recommend to patients to complement in-person sessions.

Cognitive Behavior Therapy: Cognitive behavior therapy (CBT) is a psychotherapeutic modality that was devised several decades ago to treat depression, although it has been further developed to assist individuals with a variety of conditions including chronic pain [16]. The theoretical basis of CBT is the idea that "dysfunctional" thoughts and beliefs give rise to maladaptive emotions and behaviors which, in the case of chronic pain, can increase suffering and disrupt healthy functioning. Treatment thus entails assisting the patient in testing the veracity of negative thoughts and beliefs through Socratic questioning and/or behavioral experiments. Homework assignments are an integral component of CBT and reinforce the idea that patients plan an active role in their care. CBT also involves examination of physical and behavioral contributors to pain; patients typically receive relaxation training, instruction in activity pacing, sleep management, and support for increasing their involvement in enjoyable activities [16]. CBT has been shown effective in improving mood and in reducing pain intensity, disability, and catastrophizing compared to waitlist or usual treatment controls post-treatment, although improved mood was the only significant benefit at 6- and 12-month follow-up. When compared with active control conditions, however, CBT resulted in reduced disability both at post-treatment and at 6- and 12-month follow-up [17].

Acceptance and Commitment Therapy: Acceptance and Commitment Therapy (ACT) is considered a contextual cognitive behavioral therapy and is based on approaches that use acceptance and mindfulness [18]. ACT has been specifically applied to the treatment of chronic pain and as such has a "strong" research support rating from Division 12 of the APA [19]. ACT makes strong use of metaphor and has psychological flexibility, or the ability to behave according to one's values based on contact with the present-moment situation, as the overall goal. Within ACT, the goal is not to reduce pain but to increase acceptance of experiences, including pain, and to increase valued behavior. ACT conceptualizes experiential avoidance, such as attempts to stop or guard against pain, as the source of suffering, rather than the pain itself. Treatment sessions typically include identification of a patient's life values, metaphors that help a patient to understand the concept of experiential avoidance, practicing cognitive defusion techniques (observing thoughts as simply products of our busy minds), mindfulness

training, and problem-solving perceived barriers to committed action toward valued behavior. A recent meta-analysis of ACT for chronic pain trials found, when compared to controls, a medium to large effect size for increases in pain acceptance and psychological flexibility and decreases in depression, a small effect size for improvement in functioning and decreases in pain intensity, and medium effect sizes for decreases in anxiety [20].

Group Therapy: Both CBT and ACT can be delivered in group formats in addition to individually. Benefits to group administration include social support, social learning, and connectedness. In addition, group therapy is typically more cost-effective, and providers may be able to reach more patients [21]. Group CBT has the benefit of allowing members to learn from observing and identifying difficulties in the thought and behavior patterns of others, which is often easier than self-reflection and identification [21]. The variety of problem-solving strategies and perspectives of the group can increase flexibility of thought and approaches to living with pain within the individual. The content of group ACT is very similar to that of individual treatment and includes mindfulness training, values identification, cognitive defusion, decreasing attempts to control pain, increasing acceptance, and developing plans for committed action. The groups typically last from 4 to 10 sessions depending upon the manualized protocol being adopted. Group-based ACT has been shown to produce significant improvement in pain interference, illness-focused coping, and global distress for Veterans [22] and in pain acceptance for non-Veteran populations [23]. Across all forms of psychological intervention for chronic pain, group-based treatment is generally superior to individual treatment [24].

Pharmacotherapy: A variety of medications can be effective in treating mental health conditions, such as depression and anxiety, as well as chronic pain [25]. This is particularly important for those patients who require treatment for both, although nondepressed patients can also benefit from antidepressant medications for pain relief. Two classes of medications that were developed to treat depression have also been effective for chronic pain. First, tricyclic antidepressants (TCAs) such as amitriptyline and nortriptyline have demonstrated some efficacy in the treatment of neuropathic pain, although the findings have been mixed [25]. Second, serotonin and norepinephrine reuptake inhibitors (SNRIs) such as duloxetine, venlafaxine, and desvenlafaxine are also effective in the treatment of neuropathic pain. Medications that were first introduced as anticonvulsants, i.e. gabapentin and pregabalin, are often considered the first line treatment for neuropathic pain [26] but have also been used to treat depression and anxiety [27].

20.4 Conclusions

The onset of NTOS is often associated with negative emotional functioning, due not only to the pain and loss of function of NTOS but also to changes in family and social life, recreation, and financial security. Depression and anxiety can then exacerbate the pain experience and contribute to a "vicious cycle" of pain, depression/anxiety, and decreased functioning. Mental health treatment should thus be a key element of the interdisciplinary approach to helping people with NTOS. Cognitive Behavior Therapy (CBT) and Acceptance and Commitment Therapy (ACT) have proven efficacy for the treatment of chronic pain and should be preferred over other psychotherapeutic approaches. If used, psychotropic medications that can safely address both chronic pain and emotional functioning should be selected.

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