

Treatment Approaches of Juvenile Fibromyalgia Syndrome

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Abstract

Juvenile fibromyalgia syndrome (JFMS) is an idiopathic long-term health condition characterized by widespread musculoskeletal pain in children and adolescents. The syndrome is associated with additional symptoms including multiple tender points, fatigue, non-restorative sleep, joint stiffness, headaches, cognitive dysfunction, anxiety and irritable bowel. Children and adolescents with JFMS suffer for months before the diagnosis is determined. There are various pharmacological and nonpharmacological treatments approaches for JFMS. Restoration of function, relief of pain and increasing the quality of the life are the the goals of the these treatment approaches. This brief review discusses the pharmacological and nonpharmacological treatment approaches of JFMS.

Keywords: Juvenile fibromyalgia syndrome; Rheumatism; Musculoskeletal pain; Treatment approaches

Introduction

The term “rheumatism” was firstly used by the The French Physician Guillaume de Baillou to describe the clinical manifestations of muscular pain and acute rheumatic fever in 1592. Literature on muscular rheumatism was published mostly by European Physicians from the beginning of 1800s. In 1904 British Neurologist Sir William Gowers introduced the term “fibrositis”. In the middle of 20th century, physicians initiated a growing interest in fibrositis. In 1972 Symthe was the first one who described fibromyalgia syndrome (FMS) exclusively as a generalized pain syndrome, along with fatigue, poor sleep, morning stiffness and multiple tender points [1].

FMS is generally considered to be the second most common “rheumatic” disorder, behind osteoarthritis. FMS has no known etiology, it affects approximately 4.2 % of the total population and found to be more prevalent among women. Based upon the studies, The American College of Rheumatology (ACR) developed diagnostic criteria for FMS in 1990. According to the criteria, chronic widespread pain plus the presence of at least 11 of 18 specific tender points for a duration of 3 months. But these results have not been validated for children. A new, alternative set of diagnostic criteria for FMS published in 2010. The criteria includes no longer tender points to make diagnosis and instead asking about somatic symptoms like fatigue, sleep disturbances, memory and mood problems in addition to widespread pain [2-4].

Juvenile fibromyalgia (JFMS) also known as juvenile primary fibromyalgia syndrome, is an idiopathic condition characterized by chronic widespread musculoskeletal pain, fatigue and sleep disorder. The diagnosis of JFMS has been traditionally based upon criteria developed by Yunus and Masi in 1985. The list of criteria requires negative laboratory findings for inflammation as a major criterion to differentiate it from organic disease. Fewer tender points for the diagnosis of FMS in a child than in an adult (5 instead 11) for at least 3 month and 3 of 10 minor somatic complaints include anxiety, fatigue,

headaches, poor sleep, irritable bowel syndrome, numbness, soft tissue swelling, pain modulation by weather, physical activity and distress must also be present [5-8].

JFMS most frequently affects children at approximately 10 years of age in a male : female ratio of 1:4-8. Patients with JFSM complain of pains of unknown etiology of musculoskeletal system as well as persistent headache. The pain is not caused by local inflammation but by abnormal pain receptor functions in the brain. Strong psychological stress might trigger the JFMS because the patients frequently have painful life experiences. As the disease progresses patients suffer from dyshidrosis, peripheral edema, hard to fall asleep, walking during the night and eating disorders [9]. In this report, we reviewed the literature concerning treatment approaches in JFMS.

Methods

This brief review aims to update recent information on the treatment approaches of juvenile fibromyalgia syndrome. We reviewed literature using PubMed and Sciencedirect databases respectively.

Pharmacological therapies

The etiology of JFMS is unclear, although recent studies have shown that central pain processing plays a pivotal role in its pathogenesis. It has become clear that no one therapy is broadly efficacious. The treatment approaches should be individually planned [10,11]. In terms of pharmacotherapy of JFMS, analgesics like acetaminophen and non-steroidal anti-inflammatory (NSAID) drugs are used, although less effectively for the treatment of pain. A number of different classes medications, including tricyclic antidepressants (TCAs; e.g., amitriptyline), selective serotonin reuptake inhibitors (SSRIs; e.g., sertraline and fluoxetine), serotonin norepinephrine reuptake inhibitors (SNRIs; e.g., duloxetine and milnacipran) and anticonvulsants (e.g.; pregabalin) have been approved by the US FDA for the treatment of FMS in adults. There is no strong evidence demonstrating the superiority of one medication compared to others. Most medications appear to have limited long-term effectiveness. None of these medication therapies have been tested in well-controlled

trials in JFMS, resulting in relatively limited treatment options for children with JFMS. Furthermore black box warnings are in place for amitriptyline, milnacipran and duloxetine regarding the increased risk of suicide in children treated with these medications [9,12-17].

Oxidative stress may play role in the pathophysiology of fibromyalgia. Blood mononuclear cells derived from patients with FMS have reduced levels of coenzyme Q10. Coenzyme Q 10 is a lipid-soluble substance that functions as an essential cofactor in the mitochondrial respiratory chain. Its reduced form ubiquinol-10, is an important antioxidant which directly scavenges free radicals. In a study, it was reported that FMS was associated with coenzyme Q10 deficiency, increased mitochondrial superoxide formation and lipid peroxidation level. In another study, it was found that JFMS patients were hypercholesterolemic and coenzyme Q10 deficient. Also general fatigue and hypercholesterolemia of these patients were ameliorated by ubiquinol-10 supplementation [18,19]. Vitamin D deficiency should be kept in mind in treating chronic musculoskeletal pain. Vitamin D level was negatively correlated with pain level. The presence of low vitamin D levels have been described in fibromyalgia patients in various studies [20-22].

Nonpharmacological therapies

Children and adolescents with JFMS demonstrated more temperamental instability, increased level of depression and anxiety, less family cohesion and higher sensitivity of pain [23]. Chronic or recurrent pain can affect many domains of normal daily life. Although many children with pain conditions cope well, a subgroup of children and adolescents with chronic pain have poor school attendance, reduced participation in social activities and quality of life. Due to pain and activity avoidance, adolescents with JFMS are at risk for altered joint mechanisms that may make them susceptible to increased pain [24,25]. A variety of interventions are used in the management of JFMS. The best studied nonpharmacological therapies are physical exercise and cognitive behavioral therapy [26]. Exercise programs of low to moderate intensity have been found to significantly improve physical function and quality of life in children with JFMS [27]. A randomized controlled trial of 12-week aerobic exercise intervention in JFMS patients demonstrated significant improvements in physical capacity and quality of life [28]. Exercise has been shown to be effective in pediatric rheumatic conditions, including JFMS, juvenile idiopathic arthritis and juvenile dermatomyositis [29]. Objective sleep measures, including polysomnography (PSG) and actigraphy demonstrated shorter sleep duration, poorer sleep efficiency and longer sleep onset latency among patients with JFMS. In studies, it was shown that exercise therapy has been associated with greater slow wave sleep and better sleep quality in both children and adults [30]. Patients with JFMS and their parents should be instructed by physical therapists about home-exercises, to be done at least a half-hour a day. In addition, patients should be encouraged to do low-impact exercises such as walking, cycling, swimming and stretching exercises on a regular basis [31].

Cognitive-behavioral therapy (CBT) is a psychotherapeutic approach that aims to influence the maladaptive emotions, cognitions and behaviors through systematic procedure. CBT- based techniques, such as cognitive restructuring, thought stopping, distraction, relaxation and self-reward have been effectively been used in pediatric FMS. Cognitive interventions may act as modulators of the pain response and can have a positive effect on the underlying pathological basis of FMS [16,32]. In a study, it was found significantly greater

reduction in functional disability in those who received CBT compared with FMS education [33]. CBT can help promote adherence and enhance motivation to physical activity and exercise programs. Adolescents who received CBT reported greatly improved participation in school, social and daily activities at the end of treatment. According to the studies, CBT resulted in significant decreases in depressive symptoms, functional disability, pain, somatic symptoms and fatigue in adolescents with JFMS [15,34].

Conclusion

In this report, a brief review of treatment approaches of JFMS was conducted. JFMS is a chronic health condition affecting children and adolescents at a stage of their physical and psychological developments. Early diagnosis of JFMS is important for the long-term management of the appropriate multidisciplinary treatment approaches (a major role for nonpharmacological and a relatively minor role for pharmacological treatments) for children and adolescents suffering from widespread musculoskeletal pain.

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