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Fibromyalgia—Management of a misunderstood disorder

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Abstract

Purpose: The purpose of this article is to review (a) what is currently known about the pathophysiology of fibromyalgia (FM), (b) how to identify patients who are susceptible to this disorder, and (c) the recommended pharmacological and nonpharmacological treatment options.

Data sources: Data sources include reviews and original research from scholarly journals and Internet sites.

Conclusions: There are approximately 6 million individuals in the United States diagnosed with FM, making it the third most prevalent rheumatologic disorder in this country. Failure to identify a specific causal mechanism for FM has resulted in a shift in the focus of research from etiology to treatment (Baumstark & Buckelew, 2002). Based on the literature, the most successful interventions for reduction of chronic symptoms in the FM patient is a combination of education, psychological assistance, and exercise, along with medications. It is essential that nurse practitioners (NPs) understand the issues and concerns of patients afflicted with this complex disorder. Although the organic etiology of FM syndrome remains unclear, the goals of treatment are to control pain and improve adjustment, well-being, and daily functioning of these patients to the maximum extent possible.

Implications for practice: NPs are in a unique position to help identify patients who may be suffering from FM or those diagnosed with FM reporting inadequate relief of symptoms. The incomplete understanding of the biological underpinnings, as well as the multiple symptoms that characterize FM syndrome, make it a challenging disorder to diagnose and treat. It takes time and patience to care for FM patients, and there are no "quick fixes." Diagnosis is made by a combination of patient history, physical examination, laboratory evaluations, and exclusion of other causes of symptoms confused with FM. Understanding the symptomology and recommended treatments will allow NPs to give appropriate care that may include making referrals for multidisciplinary treatment of these complex patients.

Introduction

For well over a decade, researchers and clinicians have struggled to explain patients' complaints of chronic fatigue, widespread musculoskeletal pain, poor sleep, mood disorders, and a multitude of other associated symptoms. Fibromyalgia (FM), characterized by this constellation of somatic symptoms and chronic pain, is becoming an accepted clinical entity across the country. Because the etiology of this disorder is unknown, however, there are still providers who protest diagnosing a patient with FM. Instead, they attribute the patients' symptoms to being overweight and/or depressed. Hazemeijer and Rasker (2003) believe that FM tends to be diagnosed when no other reason is found for chronic pain. Ehrlich (2003) shares this skepticism in his article, "Pain is real: Fibromyalgia isn't." Many providers attribute the pain, fatigue, and cognitive dysfunction exhibited by most FM patients to depression. The truth is, FM is a poorly recognized and poorly understood entity because, to date, the exact etiology of FM remains elusive. This article summarizes what is currently known about FM syndrome and provides

evidence-based interventions for a logical progression of treatment.

Pathophysiology

The word "fibromyalgia" is derived from the Latin roots "fibro" (connective tissue), "my" (muscles), "al" (pain), and "gia" (condition of). FM is a disorder that is neither degenerative nor progressive. It is a chronic condition of unknown etiology characterized by widespread pain, persistent fatigue, nonrestorative sleep, and generalized morning stiffness (Patkar, Bilal, & Masand, 2003). In 1990, the American College of Rheumatology (ACR) convened a group of experts to better characterize the large number of chronic musculoskeletal pain patients diagnosed with "fibrositis" that crowded the offices of rheumatologists (Staud, 2004). The primary condition is suggested by meeting the two ACR criteria of (a) history of widespread pain greater than 3 months and (b) pain in 11 of 18 selected tender points on digital palpation (Wolfe et al., 1990). These 1990 criteria are still currently used and referenced in all articles describing the diagnostic criteria for FM. Tender points are generally located over muscles or over sites where muscle inserts to tendons or bone. They may be located at the occiput, low cervical, trapezius, supraspinatus, second rib, lateral epicondyle, gluteal, greater trochanter, and knee. It is important to remember that FM syndrome may require observation over time to diagnose; therefore, failure to meet the above criteria does not absolutely exclude the possibility of future diagnosis.

Our understanding of the pathophysiology of FM has evolved significantly in recent years but still remains incomplete. Research indicates a relationship between neurobiologic, psychosocial, and behavioral factors in pain syndromes (Antai-Otong, 2005). Review of the literature describes multiple explanations for the variety of symptoms associated with FM. These symptoms can include anxiety, depression, occipital headaches, dysfunctional sleep, morning stiffness, digital paresthesia, chest wall pains, irritable bowel, and irritable bladder (Russell, 2002). While the precise cause of FM is poorly understood, suspected causes include abnormalities in neuroendocrine systems such as the hypothalamic–pituitary–adrenal axis, alterations in substance P levels, and low levels of cortisol, growth hormones, norepinephrine, and serotonin (Clauw & Crofford, 2003).

Hypothalamic–pituitary–adrenal axis dysfunction

A large body of evidence supports the relationship between stress and altered activity in both the sympathetic nervous system and hypothalamic–pituitary–adrenal axis (Mease, 2005). This hypothalamic–pituitary–adrenal axis dysfunction in FM patients leads to disturbances in the stress/adaptation response. Such patients have elevated basal values of adrenocortical trophic hormone and follicle-stimulating hormone and decreased levels of insulin-like growth factor 1 and growth hormone (Mease). Comparatively, patients with endocrine deficiencies in cortisol, growth hormone, and thyroid hormones experience symptoms similar to those observed in FM (Staud, 2004). In addition, low levels of dopamine, epinephrine, norepinephrine, growth hormone, serotonin, cortisol, and thyrotropin-releasing hormone are known to exist with FM (Peterson, 2005). Although it is unclear whether these neuroendocrine abnormalities are integral to or secondary causes of the pathogenesis of FM, several neurohormones play important roles in pain perception and may therefore be relevant in FM pain (Staud).

Serotonin levels

The most widely acknowledged biochemical abnormality associated with FM is abnormally low serotonin levels. Serotonin levels in the central nervous system may be assessed indirectly and present as low tryptophan (the amino acid precursor to serotonin) and 5-hydroxyindole acetic acid (a metabolite by-product) in the cerebrospinal fluid (Katz & Katz, 2003). Several investigators have focused attention on levels of serotonin given that this neurotransmitter is involved in both stage 4 sleep and pain modulation. Low serotonin levels in patients with FM are thought to lead to depression, anxiety, pain, sleep disturbances, and impaired smooth muscle function (Werner & Malterud, 2003). To date, no studies have determined whether depression in FM patients is because of low serotonin levels or the result of chronic pain, fatigue, and loss of daily functioning. However, studies (Bennett, 2002) report that about 30% of patients with FM have diagnosed depression. These types of statistics, combined with known serotonin imbalances in patients with FM, explain why the majority of patients with this syndrome are treated with antidepressants.

Substance P

The most dramatic laboratory abnormality, found in most FM patients (>80%), is a consistently elevated, stable level of cerebrospinal fluid substance P (Russell, 2002). Substance P is involved in the transmission of pain impulses from peripheral receptors to the central nervous system. Increased levels of substance P are known to increase the sensitivity of nerves to pain and/or heighten awareness of pain. The increased secretion of the body's excitatory neuromodulators, such as substance P, and psychologic factors further escalate pain perception (Patkar et al., 2003). It is theorized that when serotonin is low and substance P is high, people feel more pain (Peterson, 2005). This helps explain the high levels of pain in most patients with FM.

Sleep disturbances

The sleep disturbance theory postulates that FM is related to sleep quality. Electroencephalographic studies during sleep have revealed that people with FM lose deep sleep (Arthritis Research Campaign, 2004). Deep (non-dreaming), "restorative" sleep is repeatedly and excessively disturbed by lighter, dreaming (rapid eye movement) sleep. The theory supposes that stage 4 (deep) sleep is critical to the function of the nervous system, as it is during this stage that certain neurochemical processes in the body reset. Circumstances interfering with stage 4 deep sleep (such as drug use, pain, or anxiety) appear to be able to cause or worsen the condition. For example, growth hormone, produced during stage 4 sleep, is involved in tissue repair. Low levels of growth hormone, presumably because of a disrupted sleep pattern, have been identified in patients with FM.

Presenting symptoms

FM affects nearly 6 million Americans (primarily women, 80%–90%) or approximately 2%–4% of the general U.S. population (Jones, Clark, & Bennet, 2002). Although it may occur at any age, FM is most common from age 40 to 75 years (Arthritis Foundation, 2001). FM is reported by 5%–6% of patients presenting to family medicine clinics (Patkar et al., 2003). In academic medical centers, long-term follow-up care of patients with FM reportedly averages 10 outpatient visits per year and one hospitalization every 3 years for problems related to FM (Winfield, 2005). Half of these patients are in constant pain and most report chronic fatigue, sleep loss, and as many as a dozen other somatic complaints. Since 1990, FM has been recognized by the ACR as a chronic, painful, noninflammatory syndrome involving muscles, rather than joints (Wolfe et al., 1990). The typical FM patient is a menopausal woman with proximal muscle pain (rated as 7/10 in severity), mostly in the neck and shoulders or proximal thighs (Waxman, 2005). Chronic widespread pain is the defining feature of FM, but patients may also exhibit a range of other symptoms, including sleep disturbance, fatigue, headache, irritable bowel syndrome, and mood disorders.

Stress

A popular theory proposes that FM is almost always a comorbid disorder, occurring in combination with some other disorder that likely served to "trigger" the FM in the first place. There are believed to be a variety of initiating factors for FM such as psychological distress, sleep disorders (sleep apnea, limb movement disorder), inflammatory bowel syndrome, trauma, and familial tendency (Wassem, Beckham, & Dudley, 2001). Environmental factors may play a role in triggering the development of FM, and a number of "stressors" have been temporally correlated with the onset of the syndrome, including trauma, infections (e.g., hepatitis C virus, HIV, and Lyme disease), emotional stress, catastrophic events (e.g., war), autoimmune disease, and other pain conditions (Clauw & Crofford, 2003). Individual stressors should be elucidated and are often prominent. These may include job loss, marital discord, or excess family responsibilities (e.g., caring for sick elders) (Waxman, 2005). Although most FM patients report the insidious onset of pain and fatigue, approximately half of all patients describe the start of chronic pain after a traumatic event (Staud, 2004). According to Simon (2006), patients with FM are more likely than the general population to exhibit abnormal psychological issues: personality changes are eight times more likely, depression seven times more likely, anxiety four times more likely, eating disorders three times more likely, and victims of physical or sexual abuse are five times more likely to have FM. Therefore, it is important for the clinician to identify any distinct "triggering events" prior to the onset of FM symptoms to help with the diagnosis and appropriate treatment.

Sleep disturbance

Virtually, all patients describe severe morning fatigue and poor sleep patterns, either difficulty falling asleep or frequent wakening (Mease, 2005). For most of these patients, sleep lasts about 4 h and is nonrestorative, with much tossing and turning (Waxman, 2005). Disturbances in sleep include delay in sleep onset, poor maintenance of sleep, nonrefreshing sleep, sleep-associated myoclonus, and restless leg symptoms. Causes may range from rapid intrusive thoughts or dreams to painful muscles or even sleep apnea in a minority of patients (Waxman). As even healthy individuals will attest, adequate sleep quantity and quality are imperative for maximum daily functioning. For patients with FM, poor sleep habits are predicative of how much pain and fatigue they experience. "Sleep quality is a barometer for controlling the symptoms of FM, particularly muscle pain and fatigue" (Peterson, 2005, p. 51). Assessment of sleep study results may help the clinician diagnose and manage some of the common sleep disorders found in FM.

Comorbid conditions

Associated problems commonly seen in individuals with FM include depression, spastic colon, mitral valve prolapse, bursitis, joint pain, constipation, diarrhea, temporal mandibular joint syndrome, and thyroid problems (Wassem et al., 2001). The high comorbidity found in patients with FM and the similarity between cardinal symptoms of this and other closely related diseases make specific assessment of the effects of treatment on FM symptoms challenging. As many as 80% of patients with FM also fulfill criteria for

chronic fatigue syndrome, up to 80% have headaches, 75% have temporomandibular disorders, and up to 60% may have irritable bowel syndrome (Aaron & Buchwald, 2001). Although in the past, the diagnosis of FM appeared only predictive for increased dysfunction and emotional distress, recent epidemiological studies provide important evidence for excessive mortality in patients with widespread chronic pain syndromes like FM (McBeth, Silman, & Macfarlane, 2003). These findings support the relevance of FM as a distinct clinical syndrome and provide impetus for the identification of relevant FM pain mechanisms that may result in better diagnosis and treatments (Staud, 2004).

Differential diagnoses

The development of specific and sensitive tools for a differential diagnosis or for assessing the effects of treatment in patients with FM is still in its infancy. These patients often require observation over time to rule out similar conditions and firmly establish the FM diagnosis. A person who meets the criteria for FM may have yet another cause of chronic pain or may instead have a different treatable condition that mimics FM (Quisel, Gill, & Walters, 2004). Other diagnoses to consider include drug-induced myopathies (particularly in patients taking colchicine, the statin class of lipid-lowering agents, corticosteroids, or antimalarials), hypothyroidism, and connective tissue, autoimmune, and rheumatologic disorders such as spondyloarthropathy, dermatomyositis, polymyositis, systemic lupus erythematosus, and polymyalgia rheumatica (Quisel et al.). Additional possibilities that may warrant testing include mononucleosis, diabetes, multiple sclerosis, hypothyroidism, Sjögren's disease, and Lyme disease (Peterson, 2005).

No blood or imaging tests help rule in FM; therefore, testing should be kept to a minimum (Hallegua & Wallace, 2005). There are no current laboratory abnormalities in FM, but laboratory assessments (i.e., complete blood count, complete metabolic panel, hepatic/renal panel, rheumatoid factor, creatinine phosphokinase, T_3 and T_4, thyroid-stimulating hormone, iron, folate, B_{12}) are usually required to rule out other conditions. Blood tests such as antinuclear antibody, C-reactive protein, or erythrocyte sedimentation rate may prove helpful when a patient has a history of unexplained rashes, fever, weight loss, joint swelling, iritis, hepatitis, nephritis, or inflammatory back pain (insidious onset before age 40, present for more than 3 months, associated with morning stiffness, improvement with exercise) (Quisel et al., 2004). Despite there being no distinguishing or consistent laboratory abnormalities observed in FM, laboratory studies are important to rule out other diseases that may have similar manifestations (see Table 1).

Physical examination findings and diagnosis

Although there are no specific diagnostic studies to confirm the diagnosis of FM, a comprehensive physical and history, rheumatology and neurology workup, and psychiatric evaluation are necessary to make an accurate diagnosis of FM (Antai-Otong, 2005). The cost of this illness for both patient and society is reported as being considerable, with more and more patients seeking disability benefits. Identification of susceptible patients and accuracy in the diagnosis of FM by family practice providers is crucial. Patients with FM may not outwardly appear sick. Without proper diagnosis and treatment, these patients' complaints will become more abundant and their well-being significantly deteriorated.

The diagnosis of FM is based on two criteria specified by the ACR (Wolfe et al., 1990): (a) a patient's report of widespread pain (right and left sides of the body, above and below the waist, and including the axial skeleton) persisting for at least 3 months and (b) the clinician's identification of at least 11 of 18 potential tender points described in Table 2. Examination will reveal areas of pain over tender points but without classic signs of inflammation such as erythema, edema, and warmth in joints and soft tissue. A difficulty with the diagnosis of FM is its dependence on patient history and examiner technique palpating tender points. In the 1990 ACR criteria, tender points are defined as a complaint of pain (or any more dramatic response) when an examiner applies 4 kg of pressure with the pulp of the thumb or first two or three fingers, calibrated with a dolorimeter (a device that can measure the amount and rate of pressure applied over a specified surface area) (Quisel et al., 2004). This technique is difficult for providers who are untrained or unaccustomed to FM assessment. Fitzcharles and Boulos (2003)

Table 1 Laboratory studies useful in FM

Thyroid-stimulating hormone: hypothyroidism shares many features with FM clinically, especially diffuse muscle pain and fatigue
Erythrocyte sedimentation rate (ESR): the normal ESR in FM contrasts with the very low ESR in chronic fatigue syndrome and high ESR in polymyalgia rheumatica in older persons. An ESR can assist in identifying an underlying inflammatory disorder
Antinuclear antibodies (ANA): many patients with systemic lupus erythematosus (SLE) have comorbid FM. A low filter ANA is quite common in the general population and may be of no clinical significance if diagnostic features of SLE or related autoimmune disorders are not present
Rheumatoid factor (RF): many patients with rheumatoid arthritis have comorbid FM. A positive RF does not support a diagnosis of rheumatoid arthritis unless objective evidence of characteristic joint inflammation is present. A positive RF is nonspecific diagnostically in other clinical settings

Note. Adapted from Katz and Katz (2003).

Table 2 Location and description of FM tender points

Occiput: at the insertions of one or more of the following muscles: trapezius, sternocleidomastoid, splenius capitus, semispinalis capitus
Trapezius: at the midpoint of the upper border
Supraspinatus: above the scapular spine near the medial border
Gluteal: at the upper outer quadrant of the buttocks at the anterior edge of the gluteus maxiumus
Low cervical: at the anterior aspect of the interspaces between the transverse processes of C5–C7
Second rib: just lateral to the second costochondral junctions
Lateral epicondyle: 2 cm distal to the lateral epicondyle
Greater trochanter: posterior to the greater trochanteric prominence
Knee: at the medial fat pad proximal to the joint line

Note. Adapted from Wolfe et al. (1990).

Table 3 Stepwise FM management

Step 1
Confirm the diagnosis
Explain the condition
Evaluate and treat comorbid illness, such as mood disturbances and primary sleep disturbances
Step 2
Trial with low-dose tricyclic antidepressant or cyclobenzaprine
Begin cardiovascular fitness exercise program
Refer for CBT or combine that with exercise
Step 3
Specialty referral (e.g., rheumatologist, physiatrist, psychiatrist, pain management)
Trials with SSRIs, serotonin and norepinephrine reuptake inhibitors, or tramadol
Consider combination medication trial or anticonvulsant

Note. Adapted from Goldenberg, Burckhardt, and Crofford (2004).

analyzed referrals for FM to rheumatologists and found disturbing inaccuracy in the diagnosis of FM. They discovered common rheumatological conditions were overlooked and incorrectly labeled as FM. This high rate of inaccuracy in FM diagnoses should alert clinicians to consider a wider spectrum of possibilities in patients with ill-defined pain and fatigue or refer the patient to a rheumatologist if there is ambivalence regarding the diagnosis.

Pharmacological management

The inability to identify a specific causal mechanism for FM has resulted in a shift in the focus of the majority of research from etiology to symptom management. Despite some success with currently used medications, there is a large unmet need for effective pharmacotherapy in FM (Mease, 2005). Many pharmacologic, physical, and other therapies have been widely used to treat this disorder, although scientific evidence of their effectiveness is still lacking (Karjalainen et al., 2003). To date, there are no treatments for FM approved by the Food and Drug Administration. The strongest evidence found in the literature supports the use of a combination of pharmacological and nonpharmacological interventions for FM symptoms (see Table 3). These symptoms usually wax and wane over time from acute exacerbations (usually because of underlying stress) to daily functioning with minimal treatment. Therefore, treatment for FM, like any other chronic illness, is an ongoing process rather than management of a single episode. Whatever the treatment, the primary goals are to control severe pain, improve sleep, and increase daily functioning.

Antidepressants

Of all the pharmacologic treatments for FM, antidepressants have undergone the most research. A review of the literature on management of FM symptoms with medication reveals the greatest evidence for the efficacy of antidepressants, most commonly amitriptyline (Elavil). Tricyclic antidepressants (TCA) block the reuptake of norepinephrine and serotonin, which can help treat sleep disturbances, fatigue, and pain, and promote a sense of well-being in patients with FM. In approximately one third of FM patients, low doses of amitriptyline produce moderate short-term improvements in pain, disturbed sleep, patient and physician global assessments, physical status, psychological status, and capacity for activities of daily living (Winfield, 2004). Quisel et al. (2004) calculated that persons with FM treated with antidepressants were four times more likely to improve than persons treated with placebo. TCAs may not be acceptable to patients, however, because of their anticholinergic and sedative effects and their tendency to cause weight gain (Winfield, 2004). Protryptiline (Vivactil, Dista Products, Lilly, Indianapolis, IN), on the other hand, is also a tricyclic but has some beneficial energy effects when given in the daytime (Simon, 2006). Standard TCA dosages should be used for at least 6 weeks before a trial is considered unsuccessful.

Selective serotonin reuptake inhibitors (SSRIs) and the large number of other antidepressants with different mechanisms of action are not effective substitutes for TCAs as analgesic agents but can be used for the frequently concomitant depression that amplifies pain (Winfield, 2005). In a randomized, double-blind, 12-week flexible dose study of fluoxetine (Prozac, Lilly, Indianapolis, IN) in the treatment of 60 women with FM, Arnold et al. (2002) showed significant improvement in the Fibromyalgia Impact Questionnaire pain, fatigue, and depression scores when compared to subjects who received placebo. Although anecdotal evidence supports the use of SSRIs in FM, published research is still limited and controversial. Clinicians should be careful to note the dose of an antidepressant as they are often used in low doses as adjunctive agents. Despite the lack of conclusive data, clinical

experience suggests that SSRIs should be tried in patients with FM, in particular those with symptoms of anxiety, depression, and fatigue (Patkar et al., 2003).

Muscle relaxants

Centrally acting skeletal muscle relaxants are generally not effective as single agents for the diffuse pain in FM. However, muscle relaxants given at low doses and in combination with a TCA or an SSRI may provide some benefit, at least over the short term (Winfield, 2004). The use of cyclobenzaprine (Flexeril, Ortho-McNeil, Raritan, NJ) is controversial, with some studies showing supporting evidence and others reporting no evidence of a positive effect. A meta-analysis of five studies conducted by Tofferi, Jackson, and O'Malley (2004) showed that cyclobenzaprine-treated patients were three times as likely to report overall improvement in global functioning and to report moderate reductions in individual functioning, particularly sleep. The clinical practice guideline (CPG) sponsored by the American Pain Society, *Management of Fibromyalgia Syndrome* (National Guideline Clearinghouse [2004]) supports cyclobenzaprine with strong evidence for efficacy (available on the National Guideline Clearinghouse Web site). A list of medications with their strength of evidence is shown in Table 4.

Table 4 Pharmacologic management

- Strong evidence for efficacy
  - Amitriptyline: often helps sleep and overall well-being; dose, 25–50 mg at bedtime
  - Cyclobenzaprine: similar response and adverse effects; dose, 10–30 mg at bedtime
- Modest evidence for efficacy
  - Tramodol: long-term efficacy and tolerability unknown; administered with or without acetaminophen; dose, 200–300 mg/day
  - Selective serotonin reuptake inhibitors (SSRIs)
    - Fluoxetine (only one carefully evaluated at this time): dose, 20–80 mg; may be used with tricyclic given at bedtime; uncontrolled report of efficacy using sertraline
  - Dual-reuptake inhibitors (serotonin-norepinephrine reuptake inhibitors)
    - Venlafaxine: one randomized control trial (RCT) ineffective but two case reports found higher dose effective
    - Milnacipran: effective in single RCT
    - Duloxetine: effective in single RCT
  - Pregabalin: second-generation anticonvulsant: effective in single RCT
- Weak evidence for efficacy
  - Growth hormone: modest improvement in subset of patients with fibromyalgia syndrome with low growth hormone levels at baseline
  - 5-Hydroxytryptamine (serotonin): methodological problems
  - Tropisertron: not commercially available
  - S-adenosyl-methionine: mixed results
- No evidence for efficacy
  - Opioids, corticosteroids, nonsteroidal anti-inflammatory drugs, benzodiazepine and nonbenzodiazepine hypnotics, melatonin, calcitonin, thyroid hormone, guaifenesin, dehydroepiandrosterone, magnesium

Note. Adapted from Goldenberg et al. (2004).

Antiepileptics

Antiepileptic drugs are effective in a variety of different types of neuropathic pain and are widely used as analgesics (Dworkin et al., 2003). Preliminary results from a large multicenter phase II clinical trial illustrated promising results from pregabalin (Lyrica, Pfizer, New York, NY), a neuromodulator that is similar to gabapentin (Neurontin, Pfizer), in the management of diffuse pain, sleep disturbances, and fatigue associated with FM (Antai-Otong, 2005). Pregabalin, a second-generation anticonvulsant agent, is about six times more potent than gabapentin (Russell, 2002). Pregabalin (up to 150 mg three times per day) was evaluated in an 8-week, randomized, double-blind, placebo-controlled, parallel group trial that included 529 patients. Patients treated with the highest dose, 450 mg/day, of pregabalin experienced significant improvement in the endpoint mean pain score ($p < .001$) compared with those receiving placebo and were more likely to experience a 50% reduction in pain from baseline to endpoint ($p = .003$) (Crofford et al., 2002). This finding adds a new medication for the therapeutic management of FM patients who have experienced intolerance to other medications.

Nonpharmacologic therapies

The first crucial element in the treatment of pain, fatigue, and other diverse symptomatology in patients with FM is empathetic listening and acknowledgment that the patient is indeed experiencing pain (Winfield, 2005). Pharmacotherapy alone is rarely, if ever, a sufficient intervention. Integrated and holistic treatment models offer the most successful outcomes for persons with FM. The American Pain Society's CPG cites strong evidence for the benefit of exercise, cognitive behavioral therapies (CBTs), and intensive patient education for patients with FM. A physical rehabilitation program and appropriate psychological interventions should also be included in the treatment plan. Exercise programs, including strength training and flexibility training, have shown positive effects in patients with FM, improving both mood and physical function (Williams et al., 2002). Although it has been shown that exercise is an important therapy, getting patients to start (because of fatigue) and continue long term (because of postexertional pain) is a challenge. Graded aerobic exercise (e.g., low-impact aerobics, walking, water aerobics, and stationary bicycle) should start gently and progress gradually to endurance and strength training. Slow graduation of intensity is crucial, with 40%

of patients in trials involving exercise discontinuing because of pain or fatigue (Waxman, 2005). Because of the high dropout rates for FM patients in exercise programs, strategies for improving compliance, such as having the patient exercise with a family member or friend, should be discussed.

Other nonpharmacologic treatments that have been studied include (but are not limited to) CBT, patient education, acupuncture, hypnotherapy, biofeedback, relaxation therapy, balneotherapy, chiropractic manipulation, massage, ultrasound, and tender (trigger) point injections. Although a review of the literature can find "evidence of effectiveness" for each of these interventions, these studies have been too heterogeneous to allow for strong conclusions across the studies (Sim & Adams, 2002). CBT, which includes components for education, training in relaxation and coping skills, rehearsals of the skills learned, and relapse prevention, shows promise but should be considered experimental at this time (Winfield, 2005). Psychological therapies may improve management of psychological and social factors that may influence perception and maintenance of chronic pain in these patients (Mease, 2005). Complementary and alternative medicine has gained popularity with FM patients for whom traditional medicine has provided inadequate benefits. Refer to Table 5 for a list of nonpharmacologic interventions with their strength of evidence.

Conclusions

FM is a relatively common disorder that encompasses symptoms of chronic, widespread pain, sleep disturbance, fatigue, and mood disorders. The pathophysiology of the disorder is increasingly focused on neurotransmitter and neurohormone dysregulation and central sensitization of the nervous system (Mease, 2005). FM is a chronic, recurrent, and debilitating condition that is often minimized or misdiagnosed and undertreated by many clinicians (Antai-Otong, 2005).

Much is still poorly understood about FM; thus, it remains a nebulous condition. Because FM cannot be verified by objective, measurable lab tests, these patients are often labeled as depressed and given inadequate evaluations and treatment. FM is an extremely challenging and frustrating disorder for patient and practitioner alike. Nurse practitioners should focus these patients on symptom reduction rather than elimination. Establishing rapport, forming partnerships with the patient, family, and interdisciplinary team members, and providing holistic interventions are crucial to modest treatment outcomes (Antai-Otong, 2005). From a meta-analysis of 10 studies, O'Malley et al. (2000) concluded that clinicians can expect one FM patient in four to have improvement in symptoms even with appropriate treatment. Educating FM patients that although complete relief of all symptoms may not be likely, studies show that combining education, psychological assistance, and exercise with medications can improve daily functioning and well-being with minimal adverse effects.

Table 5 Nonpharmacologic management

Strong evidence for efficacy (wait-list or flexibility controls but not blinded trials)
Cardiovascular exercise: efficacy not maintained if exercise stops
CBT: improvement often sustained for months
Patient education: group format using lectures, written materials, demonstrations; improvement sustained for 3–12 months
Multidisciplinary therapy, such as exercise and CBT or education and exercise
Modest evidence for efficacy
Strength training, acupuncture, hypnotherapy, biofeedback, balneotherapy
Weak evidence for efficacy
Chiropractic, manual, and massage therapy; electrotherapy, ultrasound
No evidence for efficacy
Tender (trigger) point injections, flexibility exercise

Note. Adapted from Goldenberg et al. (2004).

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