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FIBROMYALGIA: A literature review

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ABSTRACT

Objective: To inform Health care professionals about diagnostic evaluation and various mechanisms of this little known but otherwise complex and very common disorder encountered in the clinical practice called as Fibromyalgia and its potential problems with management strategies.

Data source: I searched Pubmed, Medline using key words Fibromyalgia, MFPS and chronic widespread pain, medicines and Cochrane database of systematic reviews for exercises and psychological therapies in fibromyalgia.

Conclusion/Recommendations: Establishing the diagnosis and instituting extensive treatment and rehabilitation program can greatly improve the prognosis of the patient.

Keywords: Fibromyalgia, chronic widespread pain, myofascial pain syndrome, medication, exercises in fibromyalgia

1 INTRODUCTION

Fibromyalgia is a common condition characterised by long term chronic widespread pain for more than 3 months. Fibromyalgia patients often have heightened sensitivity to pain (hyperalgesia) and non-noxious stimuli may result in pain (allodynia). These patients may present with a wide range of additional symptoms including tenderness, sleep disturbances, fatigue, morning stiffness, cognitive complaints and mood disorders and even associated irritable bowel syndrome, chronic fatigue syndrome, migraine, Gulf war syndrome, and lower back or neck pain [1, 2, 3]·FM is one of the most common Chronic Widespread Pain conditions [1]. FM is highly under diagnosed [4]..Only 1 in 5 patients suffering from FM are actually diagnosed and ddiagnosis takes an average of 5 years [5]. The Prevalence in United States is about 2%-5% of adult population [1]. In England and Wales the prevalence rates is about 11.2% and the rates were 7% higher in women than in men [6]. It Impacts a wide range of patients. It has been found that most patients are between 25 and 60 years of age and women more likely to be diagnosed than men [4].A number of studies have assessed the prevalence of Fibromyalgia in general population, with rates ranging from 1% to 11% with overall population prevalence estimated to about 2% [7].

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2 REVIEW OF LITERATURE-

Clinical symptoms

It is a clinical syndrome characterized by widespread muscular pain (usually chronic), fatigue and muscle tenderness (tender points). Additional symptoms are common and include poor sleep (almost always), headaches, irritable bowel syndrome, cognitive and memory problems ("fibro fog"), which may be characterized by impaired concentration, problems with short and long-term memory, short-term memory consolidation, impaired speed of performance, inability to do multi-tasking, cognitive overload, and diminished attention span [8]. Numbness and tingling in fingers and toes, irritable bladder, temporomandibular joint (TMJ) disorder, restless leg syndrome, dry eyes and dry mouth, morning stiffness, anxiety and depression and palpitations. Symptoms including pain may wax and wane over time.

Pathophysiology

1. Trigger Point Manifestations-

The trigger point is responsible for the clinical symptoms of Myofacial pain syndrome (MPS). Local tenderness is quintessential to the trigger point. Pain at a distance is characteristic of MPS. It represents referred pain that is the result of trigger point-induced central sensitization. Nociceptive activity that arises in foci of painful muscle activates spinal cord dorsal horn neurons and sensitizes the

central nervous system, causing central sensitization, hyperalgesia, and referred pain. Muscle weakness without atrophy occurs due to trigger point induced motor inhibition. Restricted range of motion occurs because of the shortening of the contracted taut band, and perhaps because of pain [9]. The trigger point causes pain. At its most activated state, it causes pain at rest. In less severe cases, it causes pain as the muscle is used. Such trigger points that cause spontaneous pain are called active trigger points. A trigger point that is not spontaneously painful with use or at rest is termed latent; it is recognized by a taut band in the muscle. It does not reproduce the patient's usual pain, but is painful when activated by mechanical stimulation such as palpation or needling. This descriptive terminology illustrates the dynamic nature of the trigger point, changing in its degree of irritability or activity, and raising the question of what the minimum changes are that occur in muscle when it is injured or stressed to form the nascent trigger point. The clinically evident progression from a non-tender taut band to a tender taut band suggests that the first change in muscle is the development of the contracted or taut group of muscle fibres that can then become painful when sufficiently stressed [9].

1. Central Sensitization:

Central sensitization is believed to be an underlying cause of the amplified pain perception that results from dysfunction in the CNS [2]. This may explain hallmark features of generalized heightened pain sensitivity [10]. It Includes hyperalgesia which is amplified response to painful stimuli and allodynia which is pain resulting from normal stimuli. The theory of central sensitization is supported by the increased levels of pain neurotransmitters like Glutamate and Substance P [11, 12]. CSF levels of substance P are 3-fold higher in patients with FM. FM is believed to be a chronic, central pain state. Functional Magnetic Resonance Imaging (fMRI) data provide supporting evidence that FM involves altered central pain processing [2]. Central connections of the trigger point tenderness are certainly associated with central sensitization and hypersensitivity, just as is the case with other tissues. The central representation of pain can be imaged with functional magnetic resonance scanning (fMRI) in persons with multiple trigger points (MTrPs) that is consistent with central sensitization. At matched stimulus and pain intensity, significantly enhanced somatosensory and limbic activity and suppressed dorsal hippocampal activity are seen in patients with a hypersensitive MTrPs compared to control subjects. Modulation of pain evoked from a MTrPs by electrical stimulation is centrally mediated through the periaqueductal gray centre in the brainstem, as demonstrated by fMRI is likely to be involved in the modulation of pain affect [9].

This chart shows the relationship of muscle injury to the sensory manifestations of trigger point pain, namely the activation of peripheral nociceptors and the initiation of central sensitization [9].

Despite extensive research, the pathogenesis of pain in FM is not clearly understood. However, central sensitization has emerged as a leading theory of disease mechanism.

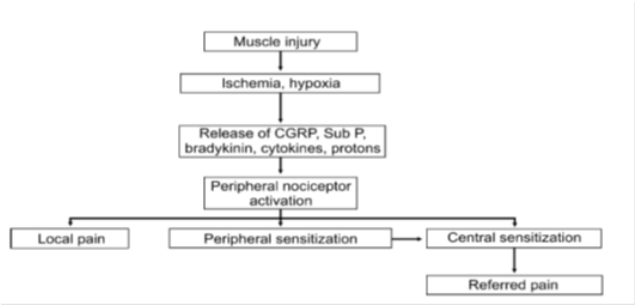


Figure 1.

1. Other theories:
2. Dopamine dysfunction
3. Serotonin metabolism:
4. Growth hormone:

- Poly-modal sensitivity:
- Sympathetic hyperactivity:

1. Cerebrospinal fluid abnormalities:

Evidence of abnormal brain involvement in fibromyalgia has been provided via functional neuroimaging. The first findings reported were decreased blood flow within the thalamus and elements of the basal ganglia and mid-brain (i.e. pontine nucleus) [18]. Differential activation in response to painful stimulation has also been demonstrated. Brain centers showing hyperactivation in response to noxious stimulation include such pain-related brain centers as the primary and secondary somatosensory cortices, anterior cingulate cortex, and insular cortex. Patients also exhibit neural activation in brain regions associated with pain perception in response to nonpainful stimuli in such areas as the prefrontal, supplemental motor, insular, and cingulate cortices. Evidence of hippocampal disruption indicated by reduced brain metabolite ratios has been demonstrated by studies using single-voxel magnetic resonance spectroscopy (1H-MRS) [19].

Diagnosis

Fibromyalgia is clinically diagnosed and there are no specific tests or investigations. American College of Rheumatology (ACR) fibromyalgia classification criteria in 1990 was used to diagnose fibromyalgia & it includes:Pain for $\geq$3 months & Pain at $\geq$11 of 18 tender points when palpated with 4 kg of digital pressure (thumb pressure with pain threshold reached at or before thumb nail blanches) or with algometer. There is history of widespread pain, which is considered widespread when all of the following are present: Pain in the left side of the body, Pain in the right side of the body, Pain above the waist, Pain below the waist, Axial skeletal pain (cervical spine or anterior chest or thoracic spine or low back). Also, important is the ain on digital palpation in at least 11 of the following 18 tender point sites

(Viz. Occiput: bilateral, at the suboccipital muscle insertion, Low cervical: bilateral, at the anterior aspect of the intertransverse spaces at C5–7, Trapezius (anterior): bilateral, at the midpoint of the upper border, Supraspinatus (anterior): bilateral, at the origin, above the scapular spine near the medial border, Second rib (anterior): bilateral, at the second costochondral junction, just lateral to the junction on the upper surface, Lateral epicondyle: bilateral, 2 cm distal to the epicondyle, Gluteal: bilateral, in the upper outer quadrant of the buttock, Greater trochanter: bilateral, posterior to the trochanteric prominence & Knee: bilateral, at the medial fat pad proximal to the joint line). Clinically digital palpation should be performed with a moderate degree of pressure. For a tender point to be considered positive, the subject must state that the palpation was painful. "Tender" is not to be considered painful.

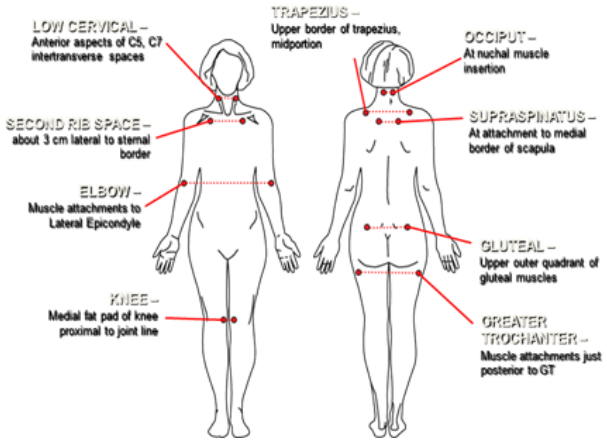
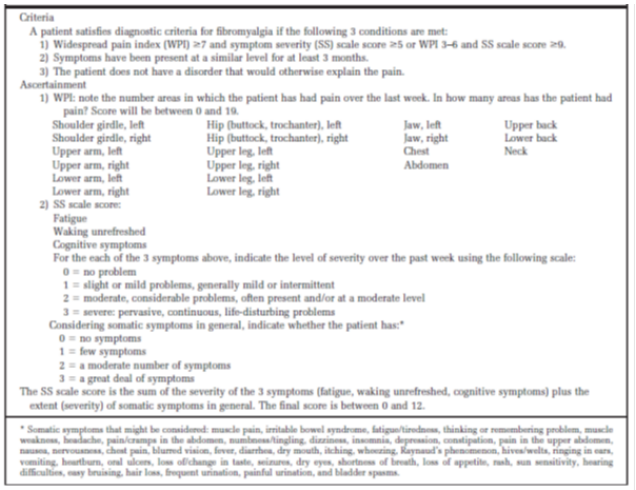


Figure 2.

Another criteria for diagnosis was introduced by the Canadians. Accordingly Canadian Diagnostic Criteria for FM Includes the ACR criteria and evaluates patients based on other symptoms commonly observed in FM (i.e., sleep disturbance and fatigue) Chronic widespread pain and tenderness are core diagnostic features. Clinical case definition of FM includes evaluation of additional clinical signs and symptoms commonly observed in patients with FM (neurocognitive manifestations, sleep disturbance, fatigue). It allows clinician to evaluate impact of entire clinical spectrum of FM and tailor treatment [20]. New ACR criteria for Fibromyalgia was introduced in 2010 as over a time, a series of objections to the ACR classification criteria developed, some practical and some philosophical. Firstly, it became increasingly clear that the tender point count was rarely performed in primary care where most fibromyalgia diagnoses occurred, and secondly, when performed, was performed incorrectly. Even many physicians did not know how to examine for tender points and some simply refused to do so. Consequently, fibromyalgia diagnosis in practice has often been a symptom-based diagnosis.

In developing new diagnostic criteria, 2 variables that best defined fibromyalgia and its symptom spectrum are Wide Spread Pain Index (WPI) and the composite Somatic Symptom (SS) scale. The WPI, which strongly correlated with the tender point count and the SS scale, best identified patients, diagnosed with the ACR classification criteria. The SS scale, a composite variable composed of physician-rated cognitive problems, unrefreshed sleep, fatigue, and somatic symptom count to measure fibromyalgia symptom severity. The WPI and the SS scale together are used to define fibromyalgia diagnostic criteria: (WPI -7 AND SS -5) OR (WPI 3–6 AND SS -9). The SS scale alone provides a measure of fibromyalgia symptom severity.


Criteria

A patient satisfies diagnostic criteria for fibromyalgia if the following 3 conditions are met:

1) Widespread pain index (WPI) ≥7 and symptom severity (SS) scale score ≥5 or WPI 3–6 and SS scale score ≥9.
2) Symptoms have been present at a similar level for at least 3 months.
3) The patient does not have a disorder that would otherwise explain the pain.

Ascertainment

1) WPI: note the number areas in which the patient has had pain over the last week. In how many areas has the patient had pain? Score will be between 0 and 19.

Shoulder girdle, left	Hip (buttock, trochanter), left	Jaw, left	Upper back
Shoulder girdle, right	Hip (buttock, trochanter), right	Jaw, right	Lower back
Upper arm, left	Upper leg, left	Chest	Neck
Upper arm, right	Upper leg, right	Abdomen	
Lower arm, left	Lower leg, left		
Lower arm, right	Lower leg, right		

2) SS scale score:

Fatigue
Waking unrefreshed
Cognitive symptoms

For the each of the 3 symptoms above, indicate the level of severity over the past week using the following scale:

0 = no problem
1 = slight or mild problems, generally mild or intermittent
2 = moderate, considerable problems, often present and/or at a moderate level
3 = severe: pervasive, continuous, life-disturbing problems

Considering somatic symptoms in general, indicate whether the patient has:*

0 = no symptoms
1 = few symptoms
2 = a moderate number of symptoms
3 = a great deal of symptoms

The SS scale score is the sum of the severity of the 3 symptoms (fatigue, waking unrefreshed, cognitive symptoms) plus the extent (severity) of somatic symptoms in general. The final score is between 0 and 12.

* Somatic symptoms that might be considered: muscle pain, irritable bowel syndrome, fatigue/tiredness, thinking or remembering problem, muscle weakness, headache, pain/cramps in the abdomen, numbness/tingling, dizziness, insomnia, depression, constipation, pain in the upper abdomen, nausea, nervousness, chest pain, blurred vision, fever, diarrhea, dry mouth, itching, wheezing, Raynaud's phenomenon, hives/welts, ringing in ears, vomiting, heartburn, oral ulcers, loss of/change in taste, seizures, dry eyes, shortness of breath, loss of appetite, rash, sun sensitivity, hearing difficulties, easy bruising, hair loss, frequent urination, painful urination, and bladder spasms.

Figure 3.

The American College of Rheumatology Preliminary Diagnostic Criteria- 2010 for Fibromyalgia and Measurement of Symptom Severity [21]

Management:

- Non Pharmacologic
- Pharmacologic

Non-Pharmacologic

1. Aerobic Exercise- Aerobic-only training has beneficial effects on physical function and some FM symptoms. Strength-only training may improve FM symptoms [22]. The group exercises 1-3 times per week, with sessions from 25 minutes to 90 minutes and the duration of the programmes from 6 weeks to 6 month have been tried. The programmes were low-intensity dynamic endurance training with a working rate at 50-70 % of maximal heart rate in relation to age. Improvements are seen on other parameters such as improvement in the number of tender points, in total myalgic scores and reduced tender point tenderness, improved aerobic capacity, physical function, subjective well-being and self-efficacy [23]. Low-to-moderate intensity aerobic exercise and strength training are strongly recommended. Chiropractic, laser therapy, magnetic field therapy, massage and transcranial current stimulation are not recommended [24]. The Ottawa Panel recommends strengthening exercises for the management of fibromyalgia as a result of the emerging evidence [25].

2. Exercises- In Cochrane Database of Systematic Reviews (2007), its documented that in people with fibromyalgia

3. Massage therapy- Short term effect of massage therapy is seen. Kalichman L suggest that massage should be painless, its intensity should be increased gradually from session to session, in accordance with patient's symptoms; and the sessions should be performed at least 1-2 times a week [27].

4. Acupuncture-

5. Cognitive-behavioural therapy (CBT)- The effects of psychological treatments for fibromyalgia are relatively small but robust and comparable to those reported for other pain and drug treatments used for this disorder. Cognitive-behavioural therapy was associated with the greatest effect sizes. Psychological treatments also proved effective in reducing sleep problems, depression, functional status, and catastrophizing. These effects remained stable at follow-up. Moderator analyses revealed cognitive-behavioural treatment to be significantly better than other psychological treatments in short-term pain reduction.

CBT can be considered to improve coping with pain and to reduce depressed mood and healthcare-seeking behaviour in FM [30].

1. Hydrotherapy- A meta-analysis of randomized controlled clinical trials on the Efficacy of hydrotherapy in fibromyalgia syndrome:

2. Psychological treatments- Psychological treatments are effective in reducing pain intensity for children and adolescents (<18 years) with headache and benefits from therapy appear to be maintained. Psychological treatments also improve pain and disability for children with non-headache pain. There is limited evidence available to estimate the effects of psychological therapies on mood for children and adolescents with headache and non-headache pain. There is also limited evidence to estimate the effects on disability in children with headache. These conclusions replicate and add to those of the previous review which found psychological therapies were effective in reducing pain intensity for children with headache and non-headache pain conditions, and these effects were maintained at follow-up [32].

Pharmacologic

Many different types of drugs have been used in an attempt to relieve symptoms of fibromyalgia–these include antidepressants, antiepileptics, and skeletal muscle relaxants. Of the drugs in this summary, only three have been approved by the FDA for the treatment of fibromyalgia. Pregabalin was approved in June 2007, duloxetine was approved in June 2008, and milnacipran was approved in January 2009. Cyclobenzaprine-treated patients were 3 times as likely to report overall improvement and to report moderate reductions in individual symptoms, particularly sleep [33]. There was no significant difference between amitriptyline compared to cyclobenzaprine at 4 weeks or compared to nortriptyline at 8 weeks. It has also been found that Amitriptyline is similar to duloxetine, milnacipran, and pregabalin on outcomes of pain and fatigue [34]. Gabapentin provides pain relief of a high level in about a third of people who take it for painful neuropathic pain. Adverse events are frequent, but mostly tolerable [35].

3 CONCLUSION/RECOMMENDATIONS

FM can be mild or disabling but often has substantial emotional & social consequences. Although FM symptoms seem to remain stable over extended periods of time, several long term studies indicate that physical function & pain worsen. Despite the good results with some of the treatments described above as found in the literature search, finding a therapy with benefit for patients with FM often is an elusive goal. FM, like many other chronic illnesses, is treatable, and remission can occur in many patients who actively participate in effective disease management programs. Working with patients of FM can be frustrating but diminution or remission of symptoms is a triumph for both the patient and the practitioner. [1–35]

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