

# DIAGNOSIS AND MANAGEMENT OF FIBROMYALGIA

FLORINA LIGIA POPA<sup>1</sup>, MIHAELA STANCIU<sup>2</sup>, MARIA ROTARU<sup>3</sup>

<sup>1,2,3</sup> "Lucian Blaga" University of Sibiu

## Keywords:

fibromyalgia, tender points, combined therapy

**Abstract:** *Introduction: Fibromyalgia is a syndrome characterized by widespread pain. The etiology is multifactorial, involving biological psychological and social factors. Purpose the work: to reveal the news regarding the diagnosis and management of fibromyalgia, highlighting the role of medical rehabilitation means within this condition. Results: Fibromyalgia diagnosis is a diagnosis of exclusion, being necessary to assess the presence of other diseases as well. Clinical and laboratory investigations are not specific. They help to diagnose the diseases which frequently coexist with fibromyalgia. Discussion and conclusions: Fibromyalgia is a complex heterogeneous disorder requiring individualized multidisciplinary approach. It is a suffering characterized by clinical polymorphism, resistant to traditional therapeutic means, also generating disability. Clinical trials have demonstrated the efficacy of the pharmacological and non-pharmacological combined therapy in fibromyalgia management.*

## INTRODUCTION

Fibromyalgia (FM) is a syndrome characterized by widespread pain that causes substantial disability, with a prevalence of 6.4% in the general population according to a recent study.(1)

Fibromyalgia etiology is multifactorial, involving biological, psychological and social factors. Possible risk factors are: female gender, genetic predisposition, menopause, poor physical condition. The inheritance is polygenic with the involvement of genes polymorphism within the serotonin catecholaminergic and dopaminergic system.(2)

### *Fibromyalgia classification:*

1. Primary or idiopathic FM is the most common form.
2. In secondary FM, there are triggering factors: infections (parvovirus, Epstein-Barr virus (EB virus), Lyme disease); injuries and physical trauma (accidents); emotional distress; major surgery; peripheral pain syndromes; hormonal disorders (hypothyroidism); drugs (statins, inhibitors of aromatase), vaccines.
3. Juvenile FM has a better prognosis than in adults. There is no evidence to support the fact that the pathophysiological mechanism would be different in the three forms.(3)

FM causes have not yet been fully elucidated. There was identified a central sensitivity and an abnormal process of central nociception, pain in FM being considered a sensorineural disorder. The biological and neuroimaging studies support this hypothesis.(4)

The pathophysiological mechanisms in fibromyalgia involve some anomalies in pain processing: excess of excitatory neurotransmitters (substance P, glutamate) resulting in neuronal hyperactivity and central sensitization; decrease of inhibitory neurotransmitters (serotonin and norepinephrine) in the antinociceptive downward pathways (5); maintaining enhanced temporal summation (by repetitive stimulation of C peripheral fibers) for secondary pain; alteration of endogenous opioid analgesic activity in several brain areas; impaired secretion of dopamine.(6)

In FM, there was identified a hypothalamic-pituitary-adrenal (HPA) axis dysfunction. Circadian adjustment and stress-induced stimulation of the HPA axis are partly regulated by serotonin. Disturbances of serotonin metabolism may explain the HPA axis abnormalities in FM.(7)

The clinical picture consists of: diffuse muscle pain and muscle tenderness symmetrically above and below the waist on both sides of the body, including the spine; joint and muscle pain, especially at night; anesthesia or tingling sensation in the hands and other parts of the body; morning stiffness (less than 1 hour); fatigue, interrupted and poor quality sleep; cognitive difficulties; anxiety and / or depression, impairment of activities of daily living (ADL); other unexplained symptoms.(8)

FM may overlap with other central sensitivity syndromes: chronic fatigue syndrome, irritable bowel syndrome, chronic pelvic pain syndrome / primary dysmenorrhea, temporomandibular joint pain, headache / migraine, post-traumatic stress disorder, multiple chemical sensitivity, restless legs syndrome, interstitial cystitis.(9)

FM frequently coexists with disorders characterized by systemic inflammation: rheumatoid arthritis (25%), Systemic Lupus Erythematosus (SLE) (50%), polymyalgia rheumatica, chronic hepatitis C.(10,11)

FM diagnosis is a diagnosis of exclusion. Assessment of other diseases should also be made: hypothyroidism, inflammatory or autoimmune disorders, cardiovascular diseases that can cause chest pain, shortness of breath and palpitations.

The American College of Rheumatology (ACR) 2010 diagnostic criteria are: diffuse pain, persistent over 3 months; hotspots (tender) at least 11 of the 18 digitally palpated in standard symmetrical locations on the body; fatigue, sleep disturbances, cognitive dysfunctions; the absence of other disorders that could have explained the pain.(12) According to the ACR 2011 modified diagnostic criteria, other symptoms within the last 6 months are also included: headache, pain or cramping in the lower abdomen and depression.

### **Pain Assessment - examining sensitive points**

1. Dolorimetry (algometry) is performed with

<sup>2</sup>Corresponding author: Mihaela Stanciu, Str. Mărăști, Nr. 6, Sibiu, România, E-mail: mihaela.stanciu@yahoo.com, Phone: +40745 301834

Article received on 02.02.2015 and accepted for publication on 06.05.2015

ACTA MEDICA TRANSILVANICA June 2015;20(2):55-57

dolormeter, which is an instrument for determining the pain pressure threshold in 4 tender points (lateral epicondyle, bilaterally, mid-trapezius muscle,  $VN \geq 4 \text{ kg / cm}^2$ ). It is a semi-quantitative method to guide the therapy.(13)

2. The pain score for each tender point is used to evaluate the response to treatment (Fibromyalgia Intensity Score - FIS 0-10).

Monitoring and assessment methods consist of general clinical, neurological, and musculoskeletal evaluation and the use of some questionnaires and scales: Fibromyalgia Oswestry Pain Questionnaire, Fibromyalgia Impact Questionnaire, Fibromyalgia Participation Questionnaire to assess the Activities of Daily Living (ADL), Short Form (SF) -36, Modified Health Assessment Questionnaire, The Physician Health Questionnaire-9 for depression, Generalized Anxiety Disorder Questionnaire for Anxiety 7.(14)

FM complications may include: extreme allodynia with high levels of distress, alcohol and opioid dependence, marked disability, marked depression and anxiety, obesity and physical deconditioning, metabolic syndrome.

Clinical and laboratory investigations are not specific. They help diagnosing the diseases which frequently coexist with FM. Antipolymer antibodies provide evidence for population subgroups with FM and are present in approximately 50% of the patients with FM. Genetic testing will be available soon, being important to establish the treatment according to genetic type.(15)

### Medical rehabilitation in FM

For the patients with FM, disability can be severe and general, reason for which the measures should be focused on improving the function. A medical rehabilitation programme in FM involves a multidisciplinary team of professionals and different individualized modalities for each patient. The team consists of a specialist physician, psychologist, physiotherapist and physical therapist experienced in treating soft tissue disorders.(16)

### Pain management - pharmacological treatment

Functional improvement in FM is difficult due to the pain barrier. There are several classes of drugs that can be used alone or in combination. Pharmacologic agents can reduce pain by increasing the levels of inhibitory neurotransmitters (duloxetine), or lowering the levels of excitatory neurotransmitters (gabapentin).

According to systematic reviews and therapeutic guidelines, there are strong evidence of efficacy for tricyclic antidepressants (amitriptyline, cyclobenzaprine), Serotonin and norepinephrine reuptake inhibitors (SNRIs), (venlafaxine, milnacipran, duloxetine), anticonvulsants (gabapentin, pregabalin), dopamine agonists (pramipexole), agents acting on the sleep-wake cycle (modafinil). Modest evidence exists for analgesics (tramadol), Selective serotonin reuptake inhibitors (SSRIs) (fluoxetine). Strong opioids are contraindicated, as well as corticosteroids, Nonsteroidal anti-inflammatory drugs (NSAIDs) and benzodiazepine hypnotics and nonbenzodiazepine.(16)

Injection of tender points/trigger leads to their mechanical interruption (myolysis) and it is useful in FM, but better results on long-term are obtained in association with physical therapy, massage, stretching exercises.

### Pain Management - nonpharmacologic treatment

**Physical Medicine:** electrotherapy, cryotherapy, thermotherapy, hydrotherapy are useful, but there is little evidence of efficacy.(17,18) For the classic massage, there is modest support regarding the beneficial effects on short term. Lymphatic manual drainage and connective tissue massage are helpful in reducing pain, improving health status and quality of

life.(19) Balneotherapy has proven effective in relieving pain and function.(20)

**Alternative medicine** (acupuncture and homeopathy) has not shown their efficacy in FM.(21,22)

**Repetitive transcranial magnetic stimulation (rTMS)** bring benefits to the quality of life in FM. Modulation of brain areas is possible with a view to correct functional abnormalities and improve FM symptoms.(23)

rTMS also bring benefits to the pain in FM. It can be considered a safe and noninvasive method, complementary to analgesics for some patients with FM, as confirmed by studies. Analgesia is induced by influencing the emotional processing associated to global pain.(23)

### Physical therapy - aerobic exercise

Low-impact aerobic exercises are recommended. The start will be with light exercise and progressivity will be slow. There will be performed at least three times a week, less than 30 minutes. Water aerobic exercises are milder and better tolerated.(24)

Meditative movement therapies (quigong, tai-chi, yoga) have modest evidence regarding efficacy in FM.(25)

**FM psychological rehabilitation strategies** are important because patients have elevated levels of stress, feelings of depression, anxiety and frustration. Treatment options include cognitive behavioral therapy, relaxation training, group therapy, biofeedback, stress management.(26)

Cognitive behavioral therapy techniques bring about changes in the thought and behaviour patterns. They are made as personal or group therapy, and the beneficial effects occur in less than 10 sessions. Superior results are obtained when they are applied in combination with exercise and/or education programmes.(27)

Poor diet exacerbates the symptoms of FM. A healthy diet rich in vitamins, minerals, antioxidants, amino acids and fiber is recommended. The patients with FM produce more free radicals than the healthy people because they have reduced antioxidant capacity.(28)

**Multidisciplinary treatment** has shown efficacy in FM. A meta-analysis that included nine randomized, controlled clinical studies (1119 patients) showed that the treatment combining at least one educational or psychological therapy with at least one kinetic method can reduce pain, fatigue and depressive symptoms.(15)

## CONCLUSIONS

Fibromyalgia is a complex heterogeneous disorder requiring an individualized multidisciplinary approach. It is characterized by clinical polymorphism, resistance to traditional therapeutic means, generating disability. Combining pharmacological treatment with the non-pharmacologic one is the ideal solution. Non-pharmacologic interventions are highly effective, but require the active participation of patients. It results the important role of medical rehabilitation in the management of patients with fibromyalgia.

## REFERENCES

1. Vincent A, Lahr BD, Wolfe F, et al. Prevalence of fibromyalgia: a population-based study in Olmsted County, Minnesota, utilizing the Rochester Epidemiology Project. *Arthritis Care Res (Hoboken)*. May 2013;65(5):786-92.
2. Jahan F, Nanji K, Qidwai W, Qasim R. Fibromyalgia Syndrome: An Overview of Pathophysiology, Diagnosis and Management. *Oman Med J*. 2012;27(3):192-195.
3. Häuser W, Eich W, Herrmann M, Nutzinger DO, Schiltenswolf M, Henningsen P. Fibromyalgia syndrome: classification, diagnosis, and treatment. *Dtsch Arztebl Int*

- 2009;106(23):383-391.
4. Burgmer M, Pogatzki-Zahn E, Gaubitz M, et al. Altered brain activity during pain processing in fibromyalgia. *Neuroimage*. 2009;44(2):502-508.
5. Ables AM, Pillinger MD, Solitar BM, Abeles M. Narrative review. The pathophysiology of fibromyalgia. *Ann Intern Med*. 2007;146:726-734.
6. Wood PB, Schweinhardt P, Jaeger E, et al. Fibromyalgia patients show an abnormal dopamine response to pain. *Eur J Neurosci*. 2007;25(12):3576-3582.
7. Tanriverdi F, Karaca Z, Unluhizarci K, et al. The hypothalamo-pituitary-adrenal axis in chronic fatigue syndrome and fibromyalgia syndrome. *Stress*. 2007;10(1):13-25.
8. Hawkins RA. Fibromyalgia: A Clinical Update. *Journal of the American Osteopathic Association*. 2013;113(9):680-689.
9. Yunus MB. Role of central sensitization in symptoms beyond muscle pain, and the evaluation of a patient with widespread pain. *Best Pract Res Clin Rheumatol*. 2007;21(3):481-497.
10. Buskila D, Press J, Abu-Shakra M. Fibromyalgia in systemic lupus erythematosus: prevalence and clinical implications. *Clin Rev Allergy Immunol*. 2003;25(1):25-28.
11. Thompson ME, Barkhuizen A. Fibromyalgia, hepatitis C infection, and the cytokine connection. *Curr Pain Headache Rep*. 2003;7(5):342-347.
12. Wolfe F et al. The American College of Rheumatology Preliminary Diagnostic Criteria for Fibromyalgia and Measurement of Symptom Severity. *Arthritis Care Res*. 2010;62(5):600-610.
13. Triñanes Y, González-Villar A, Gómez-Perretta C, Carrillo-de-la-Peña MT. Profiles in fibromyalgia: algometry, auditory evoked potentials and clinical characterization of different subtypes *Rheumatology International* 2014;34(11):1571-1580.
14. Wolfe F, Clauw DJ, Fitzcharles MA, et al. Fibromyalgia criteria and severity scales for clinical and epidemiological studies: a modification of the ACR Preliminary Diagnostic Criteria for Fibromyalgia. *J Rheumatol*. 2011;38(6):1113-1122.
15. Häuser W, Bernardy K, Arnold B, et al. Efficacy of multicomponent treatment in fibromyalgia syndrome: a meta-analysis of randomized controlled clinical trials. *Arthritis Rheum*. 2009;61(2):216-224.
16. Oral A, Ilieva EM, Küçükdevici AA, Varela E, Valero R, Berteau M, Christodoulou N. Generalised and regional soft tissue pain syndromes. The role of Physical and Rehabilitation Medicine Physicians. The European perspective based on the best evidence *European Journal of Physical and Rehabilitation Medicine*. 2014;49(4):535-549.
17. Dailey DL, Rakel BA, Vance CG, Liebano RE, Amrit AS, Bush HM, et al. Transcutaneous electrical nerve stimulation reduces pain, fatigue and hyperalgesia while restoring central inhibition in primary fibromyalgia. *Pain*. 2013;154(11):2554-2562.
18. McVeigh JG, McGaughey H, Hall M, et al; The effectiveness of hydrotherapy in the management of fibromyalgia syndrome: a systematic review. *Rheumatol Int*. 2008;27.
19. Ekici G, Bakar Y, Akbayrak T, et al. Comparison of manual lymph drainage therapy and connective tissue massage in women with fibromyalgia: a randomized controlled trial. *J Manipulative Physiol*. 2009;32(2):127-133.
20. Evcik D, Kizilay B, Gokcen E; The effects of balneotherapy on fibromyalgia patients. *Rheumatol Int*. 2002;22(2):56-59.
21. Langhorst J, Häuser W, Bernardy K, Lucius H, Settan M, Winkelmann A et al. Complementary and alternative therapies for fibromyalgia syndrome. Systematic review, meta-analysis and guideline. 2012;26:311-317.
22. Perry R, Terry R, Ernst E. A systemic review of homeopathy for the treatment of fibromyalgia. *Clin Rheumatol*. 2010;29:457-464.
23. Boyer L, Dousset A, Roussel P, Dossetto N, Cammilleri S, Piano V, Khalfa S, Mundler O, Donnet A, Guedj E. rTMS in fibromyalgia: a randomized trial evaluating QoL and its brain metabolic substrate *Neurology*. 2014;82(14):1231-1238.
24. Busch AJ, Schachter CL, Overend TJ, et al. Exercise for fibromyalgia: a systematic review. *J Rheumatol*. 2008;35(6):1130-1144.
25. Langhorst J, Klose P, Dobos GJ, Häuser W, Bernardy K, Häuser W Lucius Efficacy and safety of meditative movement therapies in fibromyalgia syndrome: a systematic review and meta-analysis of randomized controlled trials. *Rheumatol Int*. 2013;33:193-207.
26. Glombiewski JA, Sawyer AT, Gutermann J, Koenig K, Rief W, Hofmann SG. Psychological treatments for fibromyalgia: a meta-analysis. *Pain* 2010;151(2):280-295.
27. Bennett R, Nelson D. Cognitive behavioral therapy for fibromyalgia. *Nat Clin Pract Rheumatol*. Aug 2006;2(8):416-424.
28. Logan AC. Is there a fibromyalgia diet. *Fibromyalgia Aware*. Dec 2004-Mar 2005;8:46-49.