

Magdalena Atarowska, *Włodzimierz Samborski

Fibromyalgia – a disease or a pain syndrome? **

Fibromialgia – choroba czy zespół bólowy?

Department of Rheumatology and Rehabilitation, Poznań University of Medical Science
Head of Department: prof. dr hab. med. Włodzimierz Samborski

Summary

Fibromyalgia is painful, noninflammatory disease characterized by widespread pain and diffuse tenderness. The main symptoms are accompanied by fatigue, sleep disturbances, headaches and memory impairment. Etiology of fibromyalgia remains unknown and is a subject of several hypotheses. Diagnosis of fibromyalgia is based on variety of symptoms including noninflammatory generalized pain of the soft tissues. Treatment of patients with fibromyalgia is difficult and includes administration of antidepressants, muscle relaxants as well as education, psychotherapy and physiotherapy.

Key words: fibromyalgia, etiopathogenesis, symptoms, management

Streszczenie

Fibromialgia jest niezapalną chorobą z bólem, cechującą się uogólnionym bólem i rozlaną tkliwością. Głównymi objawami towarzyszącymi są: zmęczenie, zaburzenia snu, bóle głowy i zaburzenia pamięci. Przyczyna choroby jest nieznana i jest przedmiotem wielu hipotez. Rozpoznanie fibromialgii opiera się na różnorodności objawów, w tym nie zapalnym uogólnionym bólem tkanek miękkich. Leczenie chorych na fibromialgię jest trudne i obejmuje stosowanie antydepresantów, leków zmniejszających napięcie mięśni oraz edukację chorego, psychoterapię i fizjoterapię.

Słowa kluczowe: fibromialgia, etiopatogeneza, objawy leczenia

Fibromyalgia (FM) belongs to the group of soft tissue rheumatism disorders. That group includes: chronic, systemic arthralgia and myalgia, as well as allodynia in typical spots called “tender points” (1, 2). Other symptoms possible to appear during the course of the disease are: hypokinesia of muscles and joints, myasthenia gravis, chronic fatigue syndrome and persistent feeling of being shattered, sleep disorder, numerous functional and psychopathological symptoms (3,4). Progression of fibromyalgia and intensification of symptoms vary, therefore the clinical picture of fibromyalgia can be diverse (5).

Frequency of occurrence of fibromyalgia ranges from 2 to 4% of the population. In rheumatological practice that percentage is higher, reaching 7 to 8% (6). Patients who suffer from fibromyalgia are usually white, aged 20 to 50 (7), with female to male ratio from 6:1 to 9:1 (8). The number of cases of fibromyalgia observed by pediatricians is on the increase (9).

There are numerous hypotheses about factors which may trigger occurrence of the disease. Those include sleep disorder in phase IV (NREM – non-rapid eye move-

ment sleep), abnormal serotonin (5-hydroxytryptamine or 5-HT) metabolism and stress. Recently, an essential role has been attributed to the effect of so called “central sensitization”. Other concepts listed by the available literature include: decreased concentration of serum calcitonin, disturbances within the immune system, as well as the hypothalamic-pituitary-adrenal (HPA) axis disorder, which manifests with decreased secretion of cortisol due to corticotropin stimulation (corticotropin-releasing factor – CRF) or decreased synthesis of the growth hormone (GH) (10). The actual cause remains unexplained.

The most important and distinctive symptom of fibromyalgia is systemic pain. It is chronic with periods of intensification, described by the patients who suffer from it in a very dramatic and evocative way, compared to burning or mutilation of the body. The pain is usually located in the juxtavertebral and large juxtaarticular areas. Intensification of pain depends on various factors which may cause strain on the system. Those factors may be of both external and internal origin (11). External factors include excessive physical effort, viral and

**The paper dedicated to Professor Eugene J. Kucharz on his sixtieth birthday.

bacterial infections, invasive diagnostic procedures, ingested medicine, injuries and traumas, changing environmental conditions. Internal factors are: neurogenic mechanisms, hormonal disorders and hypohydration, psychosocial and personality-related factors, as well as other psychical disorders and disturbances.

Systemic, chronic pain and presence of “tender points” (second distinguishing feature of fibromyalgia) form the diagnostic criteria of the disease (12, 13). The pain should last at least 3 months and be systemic, that means affecting both sides of the body, over and under the thoracic diaphragm, in line with the body axis (in the cervical, thoracic and lumbar regions of the vertebral column or on the anterior surface of the chest. Therefore, this criterion is met if the patient describes pain as located, for example, in the right shoulder, left hip or cervical spine (14).

The second diagnostic criterion, so called “tender points”, **are hypersensitivity to pressure applied to specific points corresponding to tendon attachment points or other areas where they are located.** There are nearly 100 distinguished spots, however only 20 are the most characteristic, while 18 of them are used for examination and diagnosis (15, 16). Those points are examined by palpation in order to test their sensitivity to pressure. Palpation is conducted with a thumb or index finger, with a pressure force of about 4 kg.

Locations of those points are:

- the occiput – tendon attachments in the occipital area,
- the inferior part of the neck – intratransverse process spaces between C5-C7 vertebrae,
- a point on the superior margin of the trapezius muscle, in the middle of the distance between the shoulder and the neck,
- the supraspinatus – a point in the middle of the muscle, above the superior margin of the scapula,
- the second rib – on the superior margin, slightly lateral to the costal cartilage,
- lateral epicondyle – 2 cm distally from the lateral epicondyle of the humerus,
- *regio glutealis* – the region of superior, exterior quadrant of the gluteal sulcus,
- the greater trochanter – a point positioned behind *prominentia trochanterica*,
- the knee – the medial region of the knee (*fad pad*), proximally to the joint gap.

A spot is considered positive if applied pressure causes significant pain, reported by the patient verbally, by a grimace or wince of pain, alternatively by retraction of the extremity (*‘a jump sign’*) (17). The criterion pertaining to ‘tender points’ is met if at least 11 out of 18 examined points are hypersensitive (fig. 1).

Several symptoms may be observed in the course of FM. **Symptoms distinctive for FM include the following:**

- hypokinesia of muscles and joints, which increases in the mornings, yet can last for the whole day, affects 80% of patients and re-

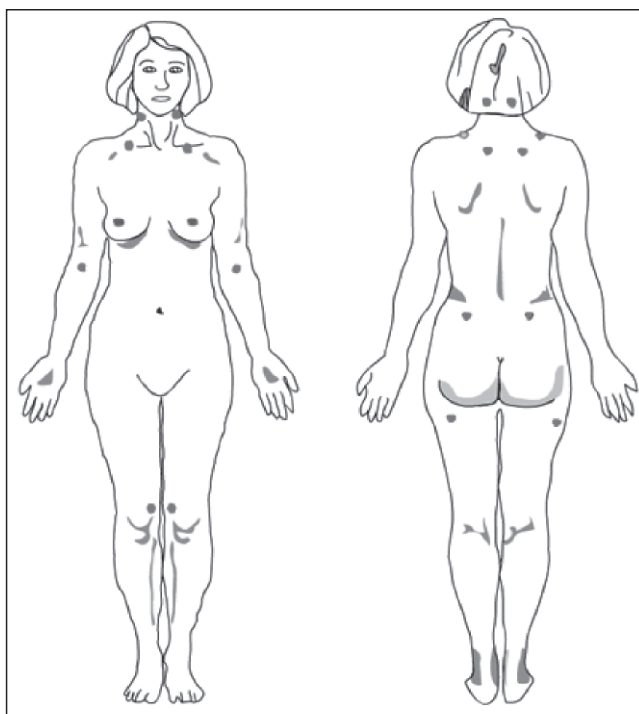


Fig. 1. “Tender points”.

Source: <http://www.ucc-ny.com/conditions-treated/fibromyalgia.html>

quires differentiation from hypokinesia distinctive for other rheumatic diseases,

- weakening of the isometric and isokinetic strength of the muscles (*myasthenia gravis*) (18), with accompanying decreased endurance, work output and grasping power,
- chronic fatigue syndrome – constant fatigue, weariness, reluctance to any physical effort,
- sleep disorder (19): shallow, short and interrupted sleep with accompanying frequent breaks and, as a consequence, morning weariness and pains in muscles and joints.

Another group of FM symptoms comprises so called autonomic disorders, which are very difficult to substantiate, even with additional tests and object examination.

The most common of those symptoms are:

- feeling of cold hands and feet,
- dryness in the mouth and throat,
- excessive perspiration,
- vertigo,
- positive dermographism,
- headaches and migraines,
- gastrointestinal disorders (irritable bowel syndrome),
- foreign body sensation in the throat,
- sensation of irregular heartbeat (palpitation),
- temporary feeling of lack of air,
- paresthesia,
- dysuria.

Moreover, many neuropsychological disorders may also be observed, like emotional disturbances:

- anxiety,
- emotional stress,

- personality disorders,
- psychasthenia,
- schizophrenia,
- depression.

Neurological symptoms include the following characteristic manifestations:

- vertigo and headaches,
- memory disorders,
- paresthesia,
- tremors and numbness of extremities,
- also dementia, which occurs in the advanced stage of the disease (6, 20).

In recent years, much attention has been drawn to one of the above mentioned, possible etiological causes of the disease, namely the effect of central sensitization. It is described by the following characteristics:

- allodynia – pain due to a stimulus which does not normally provoke pain, like a touch,
- hyperalgesia is an increased sensitivity to a painful stimulus when compared to similar reaction in healthy people.

Patients who suffer from fibromyalgia have a disturbed perception of pain, caused by intensified or prolonged attenuation of nociceptive stimuli, which may be a proof of presence of central sensitization in the course of fibromyalgia. Neuromediators, which have been researched for a long time, play an important role in that process. They participate in the process of conducting pain at the level of neurons of cornu posterius in the spinal cord. They effectuate through pre- and post-synaptic receptors and through some cytokines. The following should be listed: serotonin, substance P, neurokinin, glutamine and norepinephrine. Substance P is most probably responsible for triggering central sensitization. It participates in lowering the synaptic excitability threshold. Then, otherwise physiologically silent interspinal synapses activate and sensitization of the second neuron commences.

Research conducted in the recent years seems to confirm the concept that some biochemical disorders may be responsible for inadequate assessment of stimuli that interact with the body. Those disorders may, in turn, cause excessive nociception. During experimental research on the concentration of serotonin in the bodily fluids, significant reduction of its level in the serum and the cerebrospinal fluid was found. Thus, those experiments allow researchers to assume that disturbances in metabolism of serotonin. As a consequence, disproportions in the serotonin to substance P concentration ratio may constitute an essential problem in pathogenesis of the disease. Disturbance of equilibrium between those neurotransmitters is a cause of an increase of nociception, inadequate to the strength of a stimulus, therefore causing pain, which in turn constitutes the main symptom and diagnostic criterion of the disease (21).

Even a short characterization of the disease seems to make obvious the fact that the primary fibromyalgia syndrome constitutes a challenge for physicians of dif-

ferent specialties and patients, who very frequently are unable to cope with the disease and to learn how to live with it. Undoubtedly, one of the factors that influence such situation is multidimensional etiological aspect, which includes somatic, psychological and social factors. Detailed medical records collected by the British specialists were aimed at better and more exact cognition and understanding of the patients who suffer from fibromyalgia, to learn about their everyday life and experience gained during the many years of fighting the disease. Twelve patients under continuous supervision of a rheumatology specialist due to fibromyalgia answered questions of a survey, which was then divided into three aspects for further analysis: quality of life before and after the diagnosis (taking under consideration diagnostic difficulties and still insufficient knowledge of the disease), changes in perception of the patients' health and awareness of their bodies (clearly noticeable as suffering from emotional stress and dire moods which lead to a very limited social life), as well as the way of perception of the health care system (lack of contact with the nurses, attitude of the specialists). No differences were found in relations with patients of different sexes, whereas a group of black patients expressed a certain degree of mistrust of both attending physicians and prescribed medication. The patients expected doctors to dedicate more time to them, as well as better effects of treatment. Their subjective impressions did not correlate with the objective assessment of their physical and mental state. When interviews with the patients and assessment of the clinical practitioners were compared, it became obvious that personality of each patient and individual attitude to such issues as own health and illness, fibromyalgia in particular, have a huge influence on that assessment. Fibromyalgia is a disease which significantly worsens many aspects of the patient's life and, unfortunately, is still very vaguely known. It also causes a lot of embarrassment and confusion among the health care staff. Current diagnostic criteria are based only on a subjective assessment made by the examiner and cannot be supported by any credible and objective standard, such as a physiological or biochemical marker. According to some researched, that argument alone makes existence of fibromyalgia doubtful. Moreover, diagnostic and therapeutic problems cause the disease to require extensive expenditure. More attention should be drawn to the patient – staff relationship and, what is even more important, to relations between assumed physical, psychological and social needs of the patients who suffer from fibromyalgia. A less medical but more holistic approach in creation of new diagnostic criteria could allow for creation of a more precise somatic, and psychosocial profile of a patient with fibromyalgia. In future, that could lead to more effective treatment of the disease (22).

Experiments conducted by American neurologists aimed at assessment of type and frequency of occurrence of typical neurological symptoms in case of

patients who suffer from fibromyalgia. One hundred sixty patients with fibromyalgia and 66 people in the control group were regularly examined by a neurologist who did not have any knowledge of their condition. A standardized survey was used to assess neurological symptoms which appeared within 3 months prior to the examination. Then, an analysis of correlation between the observed symptoms and deviations found during the neurological examination was conducted. A relation was observed between reported symptoms and results of the medical examination performed in the group of patients with fibromyalgia. Noticeable deviations in neurological examination were found in the group of patients when compared to the control group, adequate in terms of age and sex. Those deviations pertained to cranial nerves IX and X (42% vs 8%), sensory nerves (65% vs 25%), motor nerves (33% vs 3%) and a way of moving (28% vs 7%). Similarly, the group of patients more often reported presence of 27 out of 29 assessed neurological symptoms. The most noticeable differences among them pertained to: photophobia (70% vs 6%), balance disorders (63% vs 4%), physical fatigue (58% vs 2%), tingling and weakness sensations in arms and legs (54% vs 4%). Balance and coordination disorders, tingling and weakness sensations in arms and legs and numbness of various parts of the body correlated with deviations found during the neurological examination. That blind, controlled placebo examination proved more frequent and intense occurrence of neurological symptoms in case of patients who suffered from fibromyalgia than in the control group. The correlation with the clinical examination was assessed as average (20).

A very distinctive feature, which at the same time makes diagnosis of fibromyalgia more difficult, is lack of deviations from the standard in results of basic laboratory tests. However, some irregularities were found in measurements of concentration of some hormones and so called neuromodulators, substances which participate in the process of feeling pain. Those are: calcitonin, somatomedin C, prostaglandin (PGE) E2, prolactin, and sex hormones (23). A research on the maintenance of levels of selected cytokines under the influence of topical injections of steroids and their influence on the muscular system of patients with fibromyalgia was conducted in Scandinavia. During that research, a decrease of PGE2 and increase in leukotriene B4 concentration was recorded, with related reduction of basal pain within muscles of rumens and accompanying increased maximum mouth opening (24).

Treatment of fibromyalgia includes use of antidepressants, muscle relaxants and tramadol-derivative drugs. Fibromyalgia patients show no response to

non-steroidal anti-inflammatory drugs and corticosteroids. Necessary supplements of the pharmacotherapy are: patient's education, psychotherapy and physiotherapy.

Physical activity is considered to be one of behavioral strategies which may protect patients with fibromyalgia against loss of fitness or, as a consequence, against disability. The purpose of research conducted at the clinical psychology ward of the Maastricht University in the Netherlands was to find empirically if stimulation of physical activity differs in any way from other behavioral strategies. The assessment was made on the available records of coping with chronic pain cases. Such issues as: necessity of patient's care, proper relaxation, help of other people, long-term effects and effectiveness of applied physical activity programs, seeking social support and coping with own beliefs (especially on the medical state) were analyzed. The above mentioned structure of chronic pain treatment records was accurately assessed with use of a subscale pertaining to the physical activities. It proved correlation between the degree of disability and the number issues that required help and care of the patient. That was in turn related to fear of physical effort and avoidance of health-promoting activities. Such behavioral patterns are very harmful, particularly in case of patients who suffer from fibromyalgia. The authors of the research recommend intense development of cognitive and behavioral therapy and actions which should help the patient face reality and challenges, encouraging them to challenge ideas and fight fears of physical effort. Stimulation of such proper behavioral patterns is an essential element in therapy of fibromyalgia and fight with the pain (27).

As a summary, there is one more controversial issue left to be decided: what is the place of fibromyalgia in the rheumatic disease classification. Some sources claim it to be a disease, while others treat it as a pain syndrome. Although the issue is complex and non-explicit, the authors of this paper incline to qualify fibromyalgia as a pain syndrome. A disease is universally considered to be related to pathological consequences within particular tissues, organs and systems. Those consequences can be confirmed with results of laboratory tests, imaging or through histopathological examination. The course of fibromyalgia, despite a wide range of symptoms pertaining mainly to the locomotor system, but also other organs of the body, usually yields no results in numerous tests and proves no deviations from the normal, healthy state. The basic symptom is always pain. Its diversity, varying intensity and extremely complex nature entitles the authors to qualify fibromyalgia as a pain syndrome.

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Adres/address:
 *Włodzimierz Samborski
 Department of Rheumatology and Rehabilitation
 Poznań University of Medical Science
 ul. 28 czerwca 1956 r. 135/147, 61-545 Poznań
 tel.: +48 (61) 831-02-44
 e-mail: samborskiw@tlen.pl