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## ORIGINAL ARTICLE

### Fibromyalgia: General Considerations. Review

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#### ABSTRACT

#### Keywords:

Fibromyalgia;  
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**Introduction:** Fibromyalgia is a clinical syndrome of an unknown etiology, characterized by the presence of diffuse and incapacitating chronic musculoskeletal pain that is normally accompanied by other symptoms like fatigue, sleep alterations, stiffness, severe headache, irritable bowel syndrome, depression, anxiety or paresthesia of the extremities and possible balance disorders.

**Objectives:** To present an updated description of the relevant clinical aspects of fibromyalgia.

**Material and methods:** We performed a literature search using Medline, ProQuest and Scopus databases, and the terms "fibromyalgia", "manual therapy" and "osteopathy".

**Results:** A retrospective, systematic review study with a sample for literature analysis, comprising 15 articles (n=15) and satisfying the screening criteria in two phases of analysis. These 15 articles represent 4.54% of the total number of found articles (n=330), and 12% of the articles fulfilling the screening criteria (n=120) (inclusion and exclusion). Fibromyalgia is a disease of an unknown cause that manifests multiple symptoms, particularly the onset of pain. The prevalence of the disease is between 1% and 5% of the population. One possible cause could be the alteration of the various levels of pain processing and modulation in the central nervous system. The diagnostic criteria used since 1990 are being questioned.

**Conclusions:** The treatment approach is currently based on reducing the intensity of the symptoms. At present, no one's treatment presents outstanding effectiveness with respect to the others used, and the patient, thus, requires a treatment applied by a multi-disciplinary team.

## INTRODUCTION

Fibromyalgia is a clinical syndrome of an unknown etiology, characterized by the presence of diffuse and incapacitating chronic musculoskeletal pain that is normally accompanied by other symptoms like fatigue, sleep alterations, stiffness, severe headache, irritable bowel syndrome, depression, anxiety or paresthesia of the extremities<sup>1-3</sup> and possible balance disorders<sup>4-7</sup>.

Pain can be considered the most common symptom, and, in fact, as explained below in further detail, is the only symptom used as a diagnostic criterion<sup>8</sup>.

In 1976, Hensch<sup>9</sup> proposed the current term, which etymologically stems from: fibro- (fibre), myo- (muscle), -algos (pain) and -ia (condition). This term is currently accepted internationally, but various authors have also employed other terms in reference to this syndrome<sup>10</sup>, such as muscular rheumatism, myalgia rheumatica, myogelosis, myofibrositis, myopathic syndrome, etc.

## MATERIALS AND METHODS

The literature review was conducted using the PubMed (MEDLINE), Sciondirect (Scopus) and ProQuest databases. The search terms entered were "fibromyalgia", "osteopathy" and "manual therapy", and all searches were restricted to publications written in English or Spanish up to 2011.

### *Eligibility and screening criteria*

Our review consisted of two search phases. We established the eligibility criteria (inclusion and exclusion) in the first phase and the screening-specific criteria for the second phase.

Eligibility criteria. In phase 1 of the search, the following inclusion criteria were applied: articles published in the indexed scientific journals, in Spanish and/or English regarding any clinical, diagnostic, therapeutic, physiological, epidemiological or socio-

economic aspect of fibromyalgia, articles related to any aspect of fibromyalgia and manual, alternative or osteopathic therapies.

Moreover, from our review, we excluded all articles published in any language other than Spanish or English, in indexed scientific and non-scientific journals, as well as any that did not meet the minimum standards for quality, such as the absence of paired reviews, the lack of a control group, and those that were not randomized.

Screening criteria. In phase 2 of our review, we applied screening criteria to the selected articles according to the Title, Abstract and Keywords, the Full Text and Bibliographic citations of the articles included in Phase 1 (Figure 1).

### *Data analysis*

Phase 1.- We performed an initial general search to obtain the published studies that generically addressed fibromyalgia in the framework of osteopathy, manual therapy and/or alternative therapies, and we developed a template for collecting general information based on the following factors: language of the publication, number of authors, public or private institution, paired review of the source journal, existence of a control group, blinded and randomized studies on fibromyalgia.

We obtained a total of 330 studies (n=330), once we had filtered out duplicates. To these, we applied the inclusion and exclusion criteria, which allowed for an initial selection of 120 articles (n=120) (Figure 1).

Phase 2.- Then, our objective was to determine the association between the specific aspects of Fibromyalgia and Osteopathy. To that end, we applied additional filters to all of the articles previously obtained in the initial search (n=330), to identify fibromyalgia studies related to osteopathy, manual techniques and alternative therapies. Thus, we screened by Title,

Abstract and Keywords, which excluded 52 (n=52) of the initially selected articles. We then filtered by full text, which resulted in the definitive inclusion of 15 studies (n=15). Lastly, we analyzed the bibliographical citations of those 15 articles to ascertain whether we could obtain additional information. This was not the case; therefore, we did not obtain any complementary studies (n=0). Considering the above, the sample for this review comprised 15 articles selected in accordance with the PRISMA criteria for systematic reviews (Figure 1).

Of all the journals we used in Phase 1 of this review, *Reumatología Clínica* was noteworthy for its articles addressing the treatments that could be employed in fibromyalgia. In Phase 2, the journals *Manual Therapy* and *Journal of Manipulative and Physiological Therapeutics* with three (n=3) and two (n=2) results, respectively, were the two publications that most contributed to our topic.

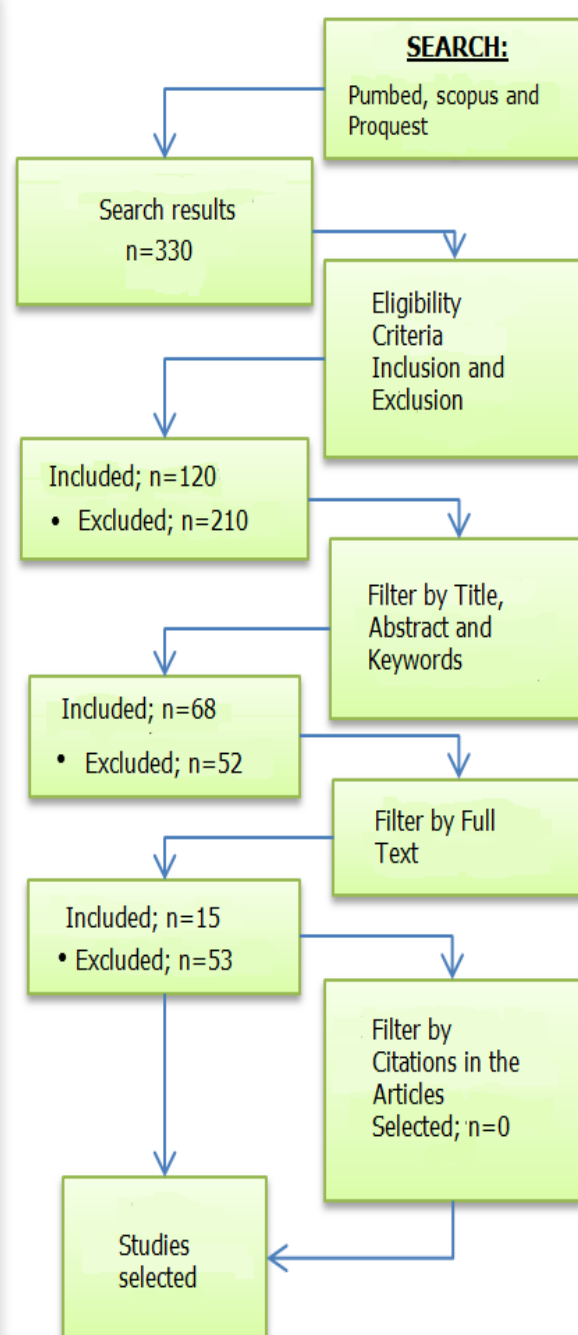
## RESULTS

Our literature analysis was made up of a total of 15 articles (n=15), satisfying the eligibility and screening criteria in two phases of analysis. These 15 articles represent 4.54% of the total number of articles found, and 12% of the articles fulfilling the eligibility criteria (inclusion and exclusion).

Our search and subsequent analysis of the various publications regarding fibromyalgia provided us information on the following aspects of the disease:

### *Etiology*

Though the cause of the disease is unknown, the studies found suggest nervous system alterations, with the possible involvement of supraspinal centers, such as the thalamus or somatosensory cortex<sup>8,11</sup>, affecting the mechanisms of transmission, modulation and processing of the nociceptive stimuli at the central nervous system level.



**Figure 1.- Flowchart for Article Selection, according to the PRISMA Statement<sup>12</sup> for Reporting Systematic Reviews and Meta-Analyses of Studies that evaluate Health Care Interventions.**

These disorders of the processing of central pain are associated with other pathophysiological alterations that lack a clear causal relationship between them, such as the hyporeactivity of the hypothalamus-pituitary-adrenal axis, growth hormone system

alterations, elevated pro-inflammatory cytokine profiles and reduced anti-inflammatory profiles, and changes in the dopaminergic and serotonergic systems<sup>13-16</sup>.

Although the majority of the current research on fibromyalgia tends to seek for a systemic explanation for the generalized muscle pain, Gerdle et al.<sup>17</sup>, in a recent study, have discovered that in muscles with pain in the fibromyalgic syndrome there is a greater objective concentration of lactate and pyruvate, thus yielding one possible explanation for the decrease in the pressure threshold.

Other suggestions include the increased probability of developing the disease in those subjects with physical or emotional stress at work, or those with a depressed demeanor<sup>14</sup>. Affective alterations constitute a risk factor for the development and maintenance of the fibromyalgic syndrome<sup>15</sup>.

There are even schools of thought that point to a possible correlation between a hormone imbalance in females and fibromyalgia pain<sup>18</sup>.

### **Epidemiology**

The prevalence of the disease in the population is between 1% and 5%<sup>8,19,20</sup>, and in Spain, in people over 20 years of age, between 2% and 2.7%<sup>1,2,21,21,22</sup>.

A recent study<sup>23</sup> on disease prevalence in 5 European countries (France, Italy, Germany, Portugal and Spain) placed it at between 2.9% and 4.7% of the population.

In terms of gender, females suffer this disease more than males, at a 21:1 ratio<sup>21</sup>.

A total of 75% of patients are females between the ages of 35 and 55 years<sup>24</sup>.

### **Diagnostic criteria**

This disease, classified as such by the WHO in 1992, has become conceptualized, due to its difficulties

in diagnosis, as a syndrome from the clinical perspective that is difficult to explain, and is occasionally considered by professionals and the public alike as a psychological disorder, due to the complexity of objectifying the findings of the physical examination, laboratory results and imaging tests<sup>3</sup>. The first formal definition of the disease was established in 1977, by Smythe and Moldofsky, and since then, several other definitions have arisen that vary in terms of the emphasis placed on the different concomitant symptoms and in the number of tender points in the syndrome<sup>25</sup>. Many rheumatologists, neurologists and pain specialists consider the disease to be a combination of pathological changes in the muscles, connective tissues and the central nervous system<sup>19</sup>.

As it has been suggested previously, generalized pain is the primary symptom of fibromyalgia, which, when combined with others, in addition to the feeling of incomprehension and uncertainty suffered by these patients, can lead the patients to a situation of anxiety and depression. These, in turn, could further aggravate their symptoms<sup>1,26</sup>. The intensity of the pain experiences appears to be related to the level of physical activity and the emotional state of the patients<sup>27</sup>.

The pain suffered by fibromyalgic patients, in addition to being generalized, is chronic and incapacitating. Together with these characteristics, multiple previously-defined points at which moderate pressure triggers pain are confirmed in the physical examination. These are known as "Fibromyalgia Tender Points" (FTP), and at least eighteen have been detected to date<sup>28-30</sup>.

The sites of the FTPs are as follows<sup>31</sup>:

- Occiput: bilateral at suboccipital muscle insertions.
- Low cervical region: bilateral, at the anterior aspect of the interspaces, between the transverse processes of C5-C7.

- Trapezius muscle: at the midpoint of the upper border.
- Supraspinatus muscle: bilateral, above the medial border of the scapular spine.
- Second rib: bilateral, at second costochondral junctions.
- Lateral epicondyle: bilateral, 2 cm distal to the lateral epicondyle.
- Gluteal: bilateral, at the upper outer quadrant of the buttocks, near the anterior fold of the muscle.
- Greater trochanter: bilateral, posterior to the greater trochanteric prominence.
- Knee: bilateral, at the medial fat pad proximal to the joint line.

In order to diagnose fibromyalgia, several criteria<sup>26,30</sup> were established in 1990, by The American College of Rheumatology, which include: the presence of generalized pain for at least 3 months and, at least, the presence of 11 FTPs<sup>11,28,32</sup>. In the assessment of points, 4kg/cm<sup>2</sup><sup>33,34</sup> of pressure is applied on each, though, according to Marquet<sup>31</sup>, there may be differences in the assessment pressure of the different points depending on their location.

The ACR criteria are currently being questioned by some parties because they were defined 20 years ago and, since then, new symptoms of the disease have been identified that should be considered in its diagnosis, such as anxiety, sleep disorders, etc.

According to Wolfe et al.<sup>35</sup>, without the need to perform a physical examination of the FTPs, but using an interview to obtain a Widespread Pain Index (WPI) and a severe symptoms scale (SS scale) value, we could achieve a more accurate diagnosis of fibromyalgia. These researchers have confirmed that these criteria identify 25% of the diagnoses excluded with the 1990 criteria. Of those patients diagnosed

using the ACR criteria, 88.1% are also diagnosed using these new criteria.

However, due to the absence of standardized tests for evaluation, caution should be exercised when diagnosing this syndrome<sup>26</sup>.

### **Treatment**

Given that the disease's origin is currently unknown, the treatment must be based on the improvement of the various clinical manifestations.

Therefore, there is no defined treatment available at this time, and treatments range from various drugs to physical activity, physical agents, psychotherapy, acupuncture, thermal therapy, homeopathy, osteopathy, etc.<sup>21,25,36-42</sup>.

Osteopaths are the most highly demanded healthcare professionals by the fibromyalgic patients, in addition to the primary care physician, rheumatologist, rehabilitation physician and psychiatrist<sup>43</sup>.

As a result of the very heterogeneous clinical presentation of this syndrome, optimized personal treatment is required for each patient, in order to attain better results<sup>44</sup>, and said treatment must be multi-disciplinary<sup>45-47</sup>.

### **Primary symptoms**

According to our literature search, in addition to pain, which we mentioned above, other symptoms manifested in fibromyalgia include:

- **Fatigue.** After pain, this is the second symptom patients hope to be improved after treatment<sup>7</sup>. It also holds the second place for the frequency of onset in patients<sup>48</sup>.

- **Cognitive impairment.** Some studies reveal the existence of a cognitive impairment in fibromyalgic patients. It seems that this impairment could depend on the chronic pain presented in the syndrome<sup>49</sup>. Patients



with fibromyalgia report memory alterations<sup>8</sup>, though other studies conclude that there are no modifications in the cognitive performance of these patients<sup>50</sup>.

- **Sleep alterations.** This symptom affects between 75% and 86% of all patients and is one of the most common symptoms<sup>20,51</sup>. It includes insomnia with 3 potential forms of manifestation: sleep maintenance insomnia, sleep onset insomnia or early-wakening insomnia. The joint manifestation of the three possibilities is the most common among fibromyalgic patients (65.6%). On the individual level, sleep maintenance insomnia is reported in the greatest number of cases (16.1%)<sup>8,46</sup>. Antidepressants are the most commonly used drugs for improving sleep quality<sup>20</sup>. These sleep alterations play an essential role in the exacerbation of other fibromyalgia symptoms<sup>52</sup>.

- **Headaches.** A total of 80% of the patients report suffering from this symptom regularly. And 48.7% of this group presents this symptom 15 or more days a month<sup>8</sup>.

- **Depression.** Although it is continuously mentioned in the list of fibromyalgia syndrome symptoms<sup>26,28,32</sup>, one study states that only 7.1% of patients included in the study fulfilled the diagnostic criterion of depression<sup>53</sup>, while other studies state (using the PRIME-MD questionnaire) that 40% of fibromyalgia patients suffer depression<sup>54</sup>. Nevertheless, the reciprocal relationship between depression and pain has been studied, and one can increase the severity of the other, and vice versa<sup>55</sup>.

- **Balance alterations.** Some studies propose studying this variable to determine the risk of falling among these patients<sup>56</sup>. Certain studies demonstrate a decrease of balance with fibromyalgia<sup>4</sup>, suffered by 63% of the subjects in this group<sup>5</sup>.

- **Joint stiffness.** This appears in 2 of every 3 fibromyalgia patients<sup>57,58</sup>. This stiffness, which in other rheumatic diseases seems to be related to the increase

of hyaluronic acid levels, may not bear any association with the fibromyalgia syndrome<sup>57</sup>.

- **Irritable bowel syndrome.** Irritable bowel syndrome is commonly presented in fibromyalgia and affects between 63% to 81% of all patients<sup>54,59,60</sup>, while in the general population, in which it is the most common gastrointestinal pathology, it is presented at 10-15%<sup>61</sup>. It is characterized by the onset of the abdominal pain and the alteration of bowel rhythm.

- **Sexual dysfunction.** Some studies suggest the correlation of fibromyalgia with sexual dysfunction, once the disease has been established<sup>62</sup>.

- Other symptoms described by some authors include hemorrhoids, epistaxis, paresthesia<sup>48</sup>, irritable bladder<sup>61</sup>, photophobia<sup>5</sup> and diverse symptoms of the cardiorespiratory, endocrine, allergy and otorhinolaryngological<sup>10</sup> spheres.

We also found that half of the patients with fibromyalgia are obese and that 30% of the rest are overweight<sup>63</sup>.

The same study that defends that data identified an important relationship between said obesity and a greater sensitivity to pain, reduced sleep quality and a decrease of physical strength and flexibility.

Recently, women with polycystic ovary syndrome have been discovered to also present fibromyalgia with greater frequency<sup>64</sup>.

### **Socio-economic aspects**

We can also state that due to the high prevalence of fibromyalgia syndrome and the fact that it is a disease whose treatment requires a large number of professionals as a result of its complex manifestation and course<sup>2,3,19,21,26,28,32,53,65</sup>, this disease involves an elevated financial cost and resource burden<sup>66-69</sup>. Therefore, it is essential that the most effective diagnostic and treatment measures be established<sup>26</sup>.

In Spain, fibromyalgia is one of the chronic processes that require the greatest number of treatments<sup>43</sup>. Despite all of this, it is difficult to quantify the healthcare expenses arising from fibromyalgia care, because the patients frequently present other simultaneous diseases, and work leaves are often classified as the cause of other syndromes<sup>70</sup>.

In other countries, where the expenses arising from the disease have been determined, we found figures that range from \$606 in Canada and \$3,056 in the US<sup>43</sup>.

From the standpoint of fibromyalgia's impact on work, we can confirm, after the literature review, that in our country there is no generalized legal recognition of the disease as the cause of work disability.

Of the 139 rulings issued between 1978 and 2008 in the Supreme Court, only 35 were in favour of the worker, and 60% of the cases resulted in permanent total disability, 22.9% permanent absolute disability, 8.6% permanent partial disability and another 8.6% of the cases were recognized as major disability<sup>71</sup>. However, one important piece of data with an economic and labor impact is the fact that 11.5% of people with fibromyalgia are found to be temporarily or permanently disabled, versus 3.2% of people without this disease<sup>43</sup>.

Reisine et al., in 2008, ensure that working women have a better state of health than those who do not work, but their symptoms evolve in the same way as those who do not work outside of the home; this initial advantage is, thus, maintained constant<sup>72</sup>.

## DISCUSSION

It is clear that fibromyalgia is a highly prevalent disease, but we remain unsure about its etiology even though, as mentioned above, fibromyalgia does not appear to be a rheumatic disease, but rather a disease originating in the central nervous system, which makes it a neurological disease.

Moreover, one of the aspects to highlight is the fact that, to date, pain has been the symptom that has been taken as reference to diagnose the disease.

However, another set of symptoms should be included, for example, fatigue and sleep alterations, to name a few.

These symptoms are as important as pain for establishing reliable diagnostic criteria. On the one hand, do not leave patients without a positive diagnosis of fibromyalgia, and, on the other, do not diagnose the disease in patients who actually do not suffer from it.

Not having the clear etiology makes it difficult to be able to act on the root of the problem; this explains why numerous different treatments that are presented only alleviate disease symptoms, but this situation, to date, have not been truly effective in treating all symptoms. Thus, the current approach for fibromyalgia requires the involvement of a wide number of different professionals, and alternative medicine such as Osteopathy is in high demand among these patients.

The need to establish reliable diagnostic criteria and effective treatments for fibromyalgia will not only serve for the purpose of providing patients with a better life quality, but it is also in demand due to the very elevated cost it involves from the perspectives of social-healthcare and pharmaceutical expenses, and temporary work leaves resulting from this disease.

## CONCLUSIONS

We can conclude this review paper by highlighting that fibromyalgia is a disease, to date, whose causes remain unknown, and therefore, for which no effective treatments that act on all triggering agents can be established, such that the current treatments are multidisciplinary and act on the symptoms manifested by the patients.

These symptoms may manifest in very diverse ways, and the diagnostic criteria used to date are being

questioned by the scientific community, due to their exclusive focus on pain-related symptoms.

### CONFLICT OF INTEREST

The authors of the manuscript declare no conflict of interest.

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