SIGNS, SYMPTOMS, AND MECHANISMS IN FIBROMYALGIA: AN EXPERIENCE REPORT AND REVIEW WITH A NEUROSCIENTIFIC FOCUS

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Abstract: This article presents an expanded analysis of the personal report of an individual with fibromyalgia, describing signs and symptoms such as chronic widespread pain, fatigue, sensory hypersensitivity, autonomic changes, and cognitive impairment. The report is integrated with contemporary scientific evidence on neurobiological mechanisms, including central sensitization, nociceptive dysfunction, neurotransmitter dysregulation, autonomic imbalance, and altered brain connectivity. Diagnostic challenges, psychosocial implications, and multidimensional therapeutic strategies are discussed. The text aims to contribute to the dialogue between subjective experience and scientific evidence, reinforcing the biopsychosocial complexity of fibromyalgia.

Keywords: fibromyalgia; chronic pain; central sensitization; neuroscience; fatigue; quality of life.

Introduction

Fibromyalgia is a syndrome characterized by diffuse musculoskeletal pain, associated with a heterogeneous set of symptoms such as persistent fatigue, sleep disturbances, cognitive changes (often called “brain fog”), and increased sensitivity to sensory stimuli (sensitivity to cold, light, noise, etc.) (Brazilian Consensus on Fibromyalgia Treatment). It is estimated that about 2% of the Brazilian population has fibromyalgia, with women being the most affected group.

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Despite the growing recognition of the syndrome, diagnosis remains challenging, because there is no specific biomarker, diagnosis is often one of exclusion and based on clinical criteria (e.g., the Generalized Pain Index and Symptom Severity Scale proposed by the American College of Rheumatology). Individual response to the syndrome is heterogeneous, and many patients report that their condition extends beyond pain, affecting daily life, mental health, and quality of life. An important aspect for scientific advancement is the incorporation of these individual reports into academic and clinical reflection.

This work takes as its starting point the case study report of a person recently diagnosed with fibromyalgia, who constructed their account based on physical, sensory, and emotional manifestations. From this, I organize a scientific discussion structured in four chapters: (1) contextualization of fibromyalgia and its relation to personal accounts; (2) catalog of signs and symptoms according to reports and literature; (3) neuroscientific mechanisms involved; (4) implications for diagnosis, management, and practical challenges. The aim is to articulate experiential voice and scientific evidence in an integrative approach.

Signs and Symptoms: Report and Comparison with the Literature.

Report of symptoms.

In the case study report, it is possible to extract a very rich set of manifestations, including:

- Chronic generalized pain, especially in the joints, neck, and lower back; Muscle spasms;
- Edema;
- Stabbing sensations in the bones and ears; Increased sensitivity to sensory stimuli: light, sound, cold;
- Autonomic and thermosensory symptoms: sensation of cold in the morning and at night, altered thermal tolerance (baths with lukewarm water);

- Feeling feverish;
- Muscle fatigue and extreme tiredness; Cognitive impairment, described as “brain fog”; Sleep disorders (insomnia);
- Visual symptoms (eye pain, blurred vision);
- Irritability and reactivity to verbal or emotional stimuli;
- Worsening of symptoms with everyday activities (talking, eating, drinking liquids) — “various triggers;
- Borderline psychological manifestation: report of “suicidal pain” — intense expression of emotional suffering.

This case study report highlights the multiplicity of domains affected: sensorimotor, cognitive, emotional, autonomic, and psychosocial.

Correlations with the scientific literature

Several clinical studies confirm that the reported symptoms are consistent with the pattern observed in patients with fibromyalgia:

Pain and sensitivityWidespread pain is the defining trait of fibromyalgia, with the presence of “tender points” and pain unrelated to any evident structural lesion. Furthermore, patients with fibromyalgia experience higher levels of pain and fatigue than patients with other chronic musculoskeletal pain conditions.

Fatigue Chronic fatigue is a prevalent complaint, often reported as even more debilitating than pain itself.

Cognitive impairment (“brain fog”)Problems with attention, memory, and executive function are frequently reported by individuals with fibromyalgia, even when no marked neuropsychological deficits are observed in objective tests. This is consistent with dysfunction in the central modulation

of pain and alterations in brain processing.

Sensitivity to sensory stimuliHypersensitivity to stimuli such as light (photophobia), sound (hyperacusis), and cold has been documented, suggesting systemic sensory amplification (not just limited to the nociceptive system).

Autonomic and thermosensory changesReports of autonomic dysfunction are recurrent in patients with fibromyalgia, with manifestations such as orthostatic hypotension, feeling cold, sweating, and peripheral visceral dysfunction, reinforcing a systemic component of the syndrome (although many of these manifestations are not yet fully elucidated).

Psychosocial and emotional factorsDepression, anxiety, and other psychiatric comorbidities are significantly more prevalent in patients with fibromyalgia, and these dimensions interact with the perception of pain and fatigue. A study on Brazilian women demonstrated that social support acts as a moderator of fibromyalgia symptoms, indicating that interpersonal support factors can mitigate the clinical impact of the syndrome.

Diagnostic and assessment challengesInstruments such as the Widespread Pain Index and the Symptom Severity Scale are widely used, but there is criticism regarding their specificity for fibromyalgia versus other chronic musculoskeletal pain conditions.

Thus, the case study report aligns well with the literature, reinforcing the heterogeneity of symptoms and the need for a multidimensional approach.

A neuroscientific approach to fibromyalgia

To understand why such diverse and seemingly disconnected manifestations occur in fibromyalgia, it is necessary to revisit knowledge about chronic pain, central modulation, and neural plasticity.

Central sensitization and nociceptive dysfunction

One of the central concepts in contemporary models of fibromyalgia is...central awareness—the process by which neurons in the spinal cord and supramedullary pathways become more reactive to nociceptive stimuli and, eventually, to non-nociceptive stimuli (allodynia). In this context:

The peripheral nociceptive afferent pathway may be normal or only slightly impaired.

The effect is altered, but the amplification occurs more proximally (in the spinal cord and brain). There is a decrease in the activation thresholds of nociceptive neurons in the dorsal spinal cord, facilitating the transmission of pain signals with weak stimuli.

Descending inhibitory pathways (e.g., involving serotonin and norepinephrine) may be compromised, reducing the central nervous system's (CNS) ability to effectively modulate pain.

Neurotransmitters, neuromodulation, and subclinical inflammation

Several neurotransmitters and biochemical mediators are implicated in fibromyalgia:

Altered levels of substances such as glutamate, substance P, and neuropeptides have been detected in studies with patients with fibromyalgia, contributing to increased central excitability.

Serotonin and norepinephrine, which are part of descending inhibitory pathways, are frequently out of balance, justifying the use of antidepressants with serotonergic and norepinephrine action in the management of fibromyalgia pain.

Emerging hypotheses suggest that low-grade inflammatory mediators (cytokines) and oxidative stress may contribute to chronic neural sensitization, although this inflammatory component is not as well characterized as in classic autoimmune diseases.

Neuroimaging and brain connectivity

Studies using functional neuroimaging techniques, such as fMRI (functional magnetic resonance imaging), have provided evidence of alterations in the brain activation pattern of people with fibromyalgia. Some findings include:

Altered connectivity between regions involved in pain processing, such as the insula, anterior cingulate cortex, prefrontal cortex, and thalamus.

Increased activation in sensory areas and decreased inhibitory modulation in pain circuits.

Differences in effective connectivity between brain regions in patients with chronic pain, pointing to functional reorganizations associated with the perception of continuous pain.

A recent integrative study (Adler et al., 2023) discusses five prominent theories of fibromyalgia: central sensitization, cytokine inflammation, muscle hypoxia, tender point theory, and small fiber neuropathy. The review suggests that abnormalities detected by fMRI and muscle elastography may reflect both structural and functional changes in tissue and central neural processing.

Integration: why so many different symptoms?

Based on these foundations, an integrative model can be proposed to explain multidimensional storytelling:

Central sensitization makes peripheral and central neurons more responsive to weak stimuli, resulting in pain from everyday stimuli (such as speech, liquid intake) - cold liquids are bad, they hurt your teeth and gums, anything natural is better.

Dysfunction of inhibitory pathways (reduced serotonin/norepinephrine and possible impairment of GABAergic pathways) compromises pain suppression.

Sensory modulation in other domains (vision, sound, cold) can be affected in an adjacent manner, as sensory circuits have interconnections with pain processing systems in the CNS, leading

to generalized hypersensitivity.

Extreme fatigue and “brain fog” can emerge from persistent cognitive overload due to maintaining pain vigilance, extremely high demand on neural resources, and subclinical neuroinflammation.

Autonomic and thermosensory changes may reflect dysfunctions of the sympathetic-parasympathetic pathways, possibly activated by chronic stress and persistent activation of the pituitary-adrenal axis (HPA axis).

Finally, emotional distress and psychosocial overload worsen the state of sensitization—there is a feedback loop between pain, stress, and cognitive changes.

This neurobiopsychosocial model helps to understand why such diverse manifestations (pain, sensory changes, fatigue, and emotional impact) coexist and reinforce each other in many patients with fibromyalgia.

Diagnostic and therapeutic implications and challenges. Challenges in diagnosis.

The heterogeneity of fibromyalgia makes diagnosis difficult. Often, professionals disregard reports that go beyond pure musculoskeletal pain. The absence of specific complementary examinations leads to diagnostic delays and prolonged suffering.

Standardized instruments (WPI, SSS) are useful, but they do not capture the full complexity of individual reports and may not discriminate well between fibromyalgia and other chronic musculoskeletal pain. It is also necessary for clinicians to value the patient’s subjective report and experience, integrating clinical, phenotypic, and psychosocial indicators.

Therapeutic approaches and multidimensional management

The Brazilian Consensus on Fibromyalgia Treatment recommends a combined approach, associating pharmacological and non-pharmacological interventions. Some important aspects:

Pharmacotherapy: use of antidepressants (e.g., duloxetine, amitriptyline), anticonvulsants (pregabalin), and adjuvant medications that modulate pain neurotransmitters. These drugs aim to rebalance the central modulation of pain.

Exercise and physical activityLight to moderate intensity activities (walking, water aerobics, stretching) have shown evidence of improving pain, fatigue, and quality of life, although adherence is often hampered by intense sensitivity and fatigue.

PsychotherapyTechniques such as cognitive behavioral therapy, mindfulness, and cognitive restructuring are useful for dealing with the emotional impact of chronic pain, promoting resilience, and modulating pain perception.

Complementary therapiesApproaches such as acupuncture, transcutaneous electrical nerve stimulation (TENS), relaxation techniques, and physiotherapy are often integrated, although results vary among patients.

Patient education and trigger managementUnderstanding and identifying personal triggers (such as certain foods, stress, cold, prolonged conversations), adjusting routines, and promoting self-awareness are essential strategies for reducing pain peaks.

Psychosocial support and interpersonal supportFamily and community support networks, support groups, and education on chronic pain can lessen the emotional impact and promote therapeutic adherence.

Limitations, gaps, and suggestions for future research.

Even with the progress, there are still significant challenges:

Most studies are cross-sectional — longitudinal trials that would allow for the assessment of causality and temporal evolution are lacking.

There is a gap in the use of reliable biomarkers or routine neuroimaging to aid in the diagnosis and stratification of patients.

Existing therapies have moderate effectiveness and vary from patient to patient; personalized medicine strategies are still in their infancy.

The integration of subjective patient reports with quantitative methods (questionnaires, scales, neuroimaging) is underexplored; research using mixed methods could improve this dialogue.

Multicenter and cross-sectional studies that include affected populations (men, different age groups, and sociocultural contexts) are needed to broaden the generalizability of the findings.

Study Case Study: Patient Report Compared with Scientific Literature

Chapter 5 integrates the direct accounts of a patient diagnosed with fibromyalgia with the scientific data presented earlier. Each topic combines: the lived experience, correlation with the literature, and a final analytical consideration, reinforcing how the case study complements the scientific evidence.

Generalized chronic pain. Report:

The patient describes intense, diffuse pain involving the cervical, thoracic, lumbar, and sacral regions, associated with a sensation of cramping without bowel movements—a visceral pain irradiated.

Confrontation with literature:

Studies indicate that patients with fibromyalgia present with diffuse musculoskeletal pain, but they also describevisceral and myofascial components, reinforcing the multisystemic nature of the syndrome. The literature confirms that the pain is not limited to the muscle:There is involvement of joints, fascia, and even poorly localized visceral perceptions., associated with central awareness.

Consideration:

The report demonstrates how fibromyalgia pain goes beyond the classic notion of "muscle pain"; it is diffuse, deep, visceral, and difficult to locate. These aspects reinforce the need for a diagnostic approach that goes beyond the conventional musculoskeletal examination.

Bone pain, jaw pain, and tooth fragility. Report:

It describes spontaneous jaw pain, a feeling of ear blockage, pain in the dental arch, enamel fragility, and worsening with acidic foods.

Confrontation with literature:

Temporomandibular joint involvement is frequently reported in individuals with fibromyalgia, partly due to muscle hyperactivity and central nociceptive amplification. Furthermore, the literature describes...orofacial hypersensitivitysuggesting that craniofacial structures are affected by the same systemic sensory dysfunction. The reported dental fragility lacks direct evidence in the literature, but it may be...secondary phenomenona:

bruxism;

tension mandibular;

xerostomia drug-induced;

hypersensitivity sensory experience of the enamel.

Consideration:

This report broadens the discussion on understudied craniofacial manifestations in fibromyalgia. It indicates the importance of integrating dentistry, otolaryngology, and rheumatology in the care of these patients.

Autonomic and thermosensory symptoms. Report:

Reports feeling cold in the morning and at night, low tolerance to extreme temperatures, a preference for lukewarm baths, and worsening of pain with cold liquids.

Confrontation with literature:

A dysfunction autonomous and widely documented in patients with fibromyalgia, including:

intolerance to the cold,

instability thermal,

changes sudomotoras,

phenotypes of sensory hypersensitivity.

Worsening pain with cold liquids suggeststhermosensory allodynia, recognized in experimental studies of central sensitization.

Consideration:

The patient's experiences clearly illustrate the thermo-sensory amplification described in neurobiological models of fibromyalgia, reinforcing the multisystemic nature of the syndrome.

Irritability and emotional reactivity. Report:

It refers to verbal aggression, “zero patience,” and an exacerbated emotional reaction.

Confrontation with literature:

Emotional changes are common due to:

overload chronic neuralgia;

failures in serotonergic inhibitory pathways; – cognitive fatigue;

changes prefrontal-limbic connectivity described in fMRI studies.

These conditions lead to areduction of emotional resilienceand increased reactivity to stress.

Consideration:

The report reinforces the idea that emotional expression in fibromyalgia should be understood as a neurobiological and psychosocial consequence, and not as a personality trait.

“The pain of suicide” and emotional suffering.

Account:

It describes a desire not to speak to anyone, a feeling of being misunderstood, abandonment and contempt.

Confrontation with literature:

Fibromyalgia presents a higher prevalence of depressive symptoms and feelings of helplessness. The concept reported as “suicidal pain” appears in qualitative studies as an extreme expression of emotional suffering and social isolation. The literature also shows that the perception of family or medical invalidation increases the risk of psychological distress.

Consideration:

The account reinforces the need for psychosocial support and clinical validation, as well as interventions that address existential suffering and not just physical pain.

Muscle and joint changes and possible dysfunctions of myelin

Report:

He mentions that the changes do not appear on MRI and refers to a sensation of muscle and joint dysfunction, questioning possible involvement of the myelin sheath.

Confrontation with literature:

Conventional MRI rarely detects changes in fibromyalgia, which reinforces the theory that the syndrome involves...functional, not structural, dysregulation.

Although fibromyalgiait is not a demyelinating diseaseThere are studies on:

neuropathy of small fibers;

micro-disorganizations functional in afferent pathways;

reduction of central inhibitory modulation.

Consideration:

The account shows how the lack of visible markers in tests generates distress and a feeling of clinical invisibility. This reinforces the importance of functional tests and empathic validation of suffering.

Pain with everyday stimuli (talking, drinking liquids)

Report:

She reports pain triggered by talking, drinking liquids, and worsened by cold liquids.

Confrontation with literature:

This phenomenon corresponds tomechanical allodynia(speech) andthermal allodynia (cold liquids), both widely described in central sensitization.

Research shows that fibromyalgia pain can be triggered by stimuli that do not normally activate nociceptors.

Consideration:

This case clearly illustrates how sensory enhancement profoundly modifies daily life, an aspect that is rarely explored in traditional clinical scales.

Frustration with diagnosis and feeling of invalidation. Report:

Report frustration for the lack of exams conclusive and sensation of to be discredited.

Confrontation with literature:

Qualitative studies on patients with fibromyalgia demonstrate:

sensation of stigma;

perception of “invisible pain”;

difficulty in obtaining medical and family recognition.

This phenomenon has a direct impact on mental health and treatment adherence.

Consideration:

This finding highlights the need for training professionals in empathetic communication and in recognizing the legitimacy of subjective reports in fibromyalgia.

Pharmacotherapy and side effects: Report.

He mentions that medications such as duloxetine, amitriptyline, and pregabalin did not provide relief.

The pain caused liver overload.

Confrontation with literature:

The literature records its effectiveness.modestOf these treatments, approximately 30% of patients experience significant improvement. Side effects are common and lead to treatment discontinuation.

Consideration:

The report reinforces the need for personalized therapy and alternatives that take into account individual pharmacological limitations.

Physical exercises, complementary therapies and responses paradoxical

Report:

Exercises They brought no improvement.

Acupuncture The pain worsened even after 10 sessions.

Activities Dance, hydrotherapy, and warm water bring improvement.

Activities Those that require effort get considerably worse.

Confrontation with literature:

Although the literature suggests benefits from light to moderate exercise, many patients, especially those with strong central sensitization, report significant worsening with physical exertion (post-exercise phenomenon).

This is also described in overlapping syndromes, such as chronic fatigue.

Hydrotherapy in warm water shows strong evidence of improving pain and mobility.

Consideration:

This case demonstrates that the response to exercise in fibromyalgia is not uniform; it depends on the sensitization phenotype and individual tolerance. This reinforces the need for individualized protocols.

Final considerations (Conclusion)

The personal account analyzed offers a vivid and profound, impressive testimony to the complexity of fibromyalgia and its multiple affected domains—sensory, emotional, cognitive, and autonomic—as well as the complexity of fibromyalgia symptoms, reinforcing its multisystemic nature. Her experience confronts and simultaneously confirms the neuroscientific models presented, reinforcing that fibromyalgia is more than a painful condition: it is a central amplification disorder that alters the body's relationship with the environment and with the self.

The findings are consistent with current neuroscientific evidence, according to which fibromyalgia involves central pain amplification, sensory alterations, autonomic dysfunction, and significant psychosocial impact.

The coexistence of chronic pain, extreme fatigue, sensory hypersensitivity, cognitive impairment, and emotional distress. This type of narrative reinforces the need for research and clinical approaches not to reduce the syndrome to a single domain (e.g., musculoskeletal pain), but to recognize its multidimensional nature.

The absence of objective markers does not diminish its clinical legitimacy; on the contrary, it reinforces the essential role of subjective reporting and skilled listening.

Neuroscientific evidence suggests that fibromyalgia can be understood as a condition ofcentral amplification, in which the neural regulation of pain, sensitivity, and cognitive-emotional

states is altered. Changes in pain modulation circuits, neurotransmitter imbalances, reorganizations of brain connectivity, and possible low-grade inflammatory components contribute to a feedback loop between pain, fatigue, and stress.

For the clinic, this means that management must be multidisciplinary, combining pharmacological interventions, physical rehabilitation, psychological support, and chronic pain education. Assessing only pain intensity without considering sensory triggers, cognitive signals, and the emotional context results in undertreatment or insufficient therapy.

It is considered that: the patient's subjective experience is a valuable source of scientific data; neurobiopsychosocial models integrate the clinical phenomenon more effectively; management should be individualized and multidisciplinary; validation of pain and the patient's experience is an essential part of care.

This study reinforces the need for greater integration between research, clinical practice, and personal accounts, contributing to a more humane and scientifically accurate approach.

Finally, this work highlights the importance of valuing the patient's voice—integrating rich subjective accounts with scientific methods is both a challenge and an opportunity. Fibromyalgia does not fit into a single model, and clinical science needs to be open to continuous dialogue between lived experience and theory.

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