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Chronic Fatigue Syndrome: Insights and Treatment Perspectives – a literature review

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ABSTRACT

Introduction: Chronic Fatigue Syndrome (CFS) is an exhausting continuous medical condition. In most cases it affects patients after a flu-like infection. CFS correlates with alterations in the nervous and immune systems, metabolism, and hormone secretion. Diagnostic process is very challenging due to the absence of a definitive diagnostic test and wide symptomatology. It negatively impacts people's both mental and physical health.

Aim of the study: The aim of this literature review is to comprehensively examine current research findings and literature on Chronic Fatigue Syndrome (CFS), understand its etiology, how it affects the body, why it's challenging to diagnose, the various treatments available, new ideas and viewpoints in the field.

Describing the State of Knowledge: Despite extensive investigation, the exact etiology of CFS remains unknown. In literature CFS is also often described as Myalgic Encephalomyelitis. In the WHO's most recent classification, the ICD-11, both Chronic Fatigue Syndrome and Myalgic Encephalomyelitis are classified as “other disorders of the nervous system” which indicates the significance of the issue.

Conclusions: This literature review underlines the importance of a comprehensive and collaborative approach in addressing the complexities of CFS and improving outcomes for individuals living with this debilitating condition.

Key words: Chronic Fatigue Syndrome; Myalgic encephalomyelitis; malaise; CFS; Neuroimmune Disorders

Introduction

Chronic Fatigue Syndrome is considered as one of the most mysterious diseases among people. It affects more than 2 million people in the United States only [1]. Women and people over 40 years old are at a particularly increased risk of getting sick [1,2]. The etiology of CFS is unclear and complex. Flu-like infections for instance mononucleosis often precede the disease, but physical trauma or psychological stress may also act as a trigger [3]. It is said that symptom profile of CFS has considerable overlap with post COVID-19 condition [4]. This fact underlines the scale of pro-inflammatory effect of viruses on human body.

Etiology

Dysregulation of the immune system is said to lie at the bottom of the disease. Symptoms may be caused by natural killer (NK) cell function impairment, increased number of B cells and activated $CD8^+$ T cells [5]. Patients can also present with hypercytokinemia [6]. Individuals with ME/CFS exhibit heightened production of complement products, elevated oxidative stress accompanied by a reduced antioxidant reaction, and increased levels of interleukin 10 and TLR4. Some of these changes are associated with the severity of symptoms experienced by the individuals [7].

Neuroinflammation has emerged as another potential fundamental mechanism in ME/CFS, offering a possible explanation for a broad spectrum of symptoms. Several research indicate the presence of neuroinflammation in cortical and limbic brain areas among patients with ME/CFS. For instance, elevated levels of brain lactate and choline, indicative of neuroinflammation, have been observed in this population [8].

Moreover, investigations in metabolic processes have pointed CFS as a condition characterized by reduced metabolic activity, marked by declines in numerous metabolic pathways [9]. Although it remains uncertain whether these deficiencies are a potential trigger or outcome of ME/CFS, heightened mitochondrial harm, diminished ATP generation and compromised oxidative phosphorylation collectively suggest that ME/CFS may be indicative of a mitochondrial disorder.

Symptoms and Diagnostic Criteria

To diagnose CFS, doctors rely on the symptoms and medical history. No specific laboratory abnormalities are officially recognized for diagnosis. Although physical irregularities may be detected, no singular observation is adequate for diagnosis. Various tests, including blood and urine analyses are employed to exclude alternative conditions potentially accounting for the symptoms. Several sets of rules and standards are available to diagnose CFS. These include the NICE guidelines, IOM criteria, the International Consensus Criteria (ICC), the Canadian Consensus Criteria (CCC), and CDC criteria. To diagnose Chronic Fatigue Syndrome (CFS) medical guidelines typically require the presence of persistent or recurring fatigue lasting for at least six months. Additionally, diagnosis requires persistent occurrence of at least four out of eight other symptoms commonly associated with the condition [10].

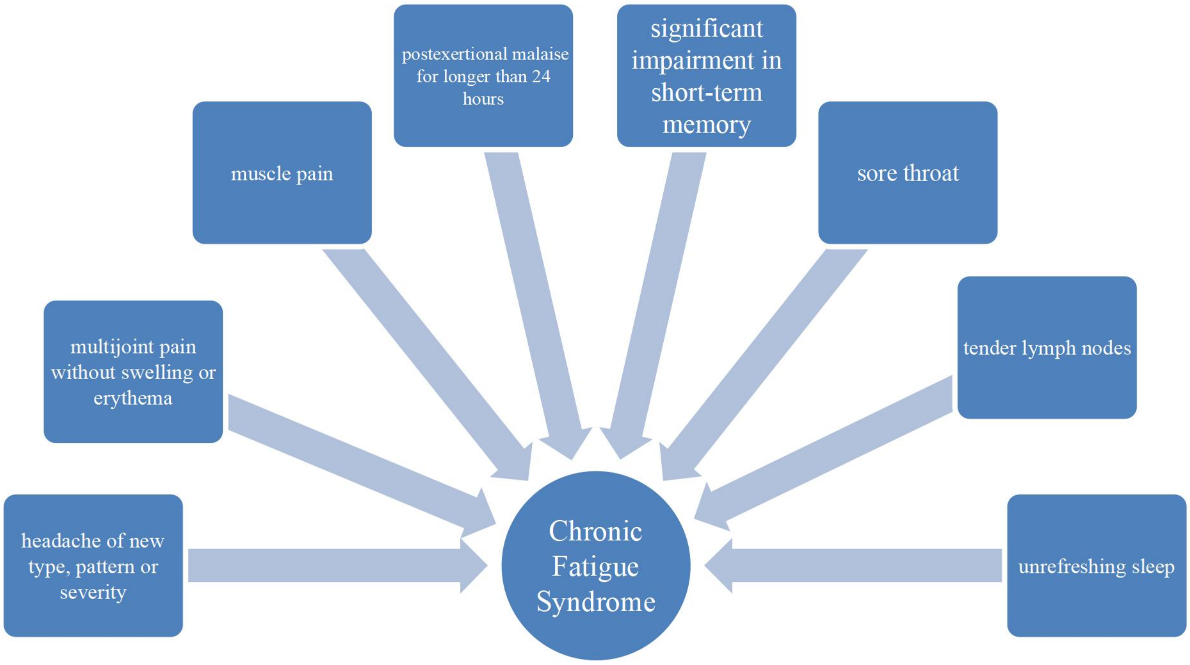

Figure 1. Graphic showing a set of CFS symptoms and diagnostic criteria.

Some common symptoms reported in the literature include gastrointestinal disturbances such as digestive issues, nausea, bloating, abdominal pain, and irritable bowel syndrome (IBS)-like symptoms, which can contribute to overall discomfort and fatigue [11]. Patients may also present with sensitivities to sensory stimuli: heightened sensitivity to light, noise, odors, and certain foods or medications, leading to sensory overload and exacerbation of symptoms [12,13]. Individuals with MCFS frequently encounter orthostatic intolerance, where symptoms exacerbate upon standing or sitting upright. These symptoms, such as lightheadedness, dizziness, and cognitive difficulties, often improve again after lying down [14].

In the ME/CFS community exists a diverse range of sleep disturbances. Patients often wake up feeling fatigued and achy rather than refreshed after a night's rest. This may stem from irregular sleep patterns, such as daytime sleeping and nighttime wakefulness, shallow or fragmented sleep [15]. However, even with a complete night's rest, rejuvenation is typically lacking. Others may encounter insomnia, excessive sleepiness (hypersomnia), or vivid nightmares [15,16].

It's important to note that the presentation of symptoms can vary widely among individuals with CFS/ME, the severity and combination of symptoms may fluctuate over time. Additionally, these symptoms often overlap with other medical conditions, making diagnosis challenging and emphasizing the need for comprehensive medical evaluation and personalized management approaches.

Management Strategies for Chronic Fatigue Syndrome

Chronic Fatigue Syndrome (CFS), also known as Myalgic Encephalomyelitis (ME), presents a significant challenge for both patients and healthcare providers due to its complex and often fluctuating nature. While there is currently no cure for CFS/ME, various treatment approaches aim to alleviate symptoms, improve quality of life, and support overall well-being. A multidisciplinary approach is widely recommended for the management of CFS/ME, involving collaboration among healthcare professionals such as physicians, psychologists, physiotherapists, and occupational therapists [17].

Energy conservation strategies, pacing techniques, and establishing realistic activity goals are central to managing fatigue in CFS/ME. Gradual increases in activity levels, balanced with adequate rest periods, can help prevent symptom exacerbation [17,18].

Pharmacological interventions such as analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) may be prescribed to reduce muscle and joint pain. Additionally, complementary therapies such as acupuncture, massage, and gentle stretching exercises may provide relief for some individuals [19].

Adopting a balanced diet rich in nutrient-dense foods may help support overall health and energy levels in patients with CFS/ME. Dietary supplements such as vitamins B12, D, and magnesium are commonly used to address nutritional deficiencies and support cellular function [20].

While traditional exercise regimes may exacerbate symptoms in CFS/ME, graded exercise therapy (GET) and supervised exercise programs tailored to capabilities have shown benefits in improving physical function and reducing fatigue severity. However, caution must be applied to prevent post-exertional malaise and symptom exacerbation [21]. Given the emerging evidence of mitochondrial dysfunction in CFS/ME pathophysiology, mitochondrial-targeted therapies such as coenzyme Q10 (CoQ10), ribose supplements, and mitochondrial membrane stabilizers are being explored for their potential in improving cellular energy production and reducing fatigue [22].

Economic Outcomes of Chronic Fatigue Syndrome

CFS not only affects patients’ health and well-being but also carries significant economic consequences. This chapter explores the economic outcomes associated with CFS/ME, including direct healthcare costs, indirect costs related to productivity losses, and the overall economic impact on society [23,27]. The management of CFS/ME involves frequent healthcare encounters, diagnostic evaluations, and treatment interventions, contributing to significant direct healthcare costs. These costs contain expenses related to physician consultations, laboratory tests, diagnostic procedures, medications and specialized healthcare services.

Additionally, individuals with CFS/ME may require referrals to various healthcare professionals, including specialists in rheumatology, neurology, and psychiatry, further augmenting healthcare expenditures [23,24]. It can severely impair individuals' ability to work or engage in daily activities, leading to substantial productivity losses. Absence from work, reduced work hours, and impaired job performance contribute to decreased productivity and income loss among people suffering from CFS/ME.

Moreover, caregivers may also experience productivity losses as they provide support and assistance to their loved ones [25]. The unpredictable nature of CFS/ME symptoms may result in financial insecurity, housing instability and difficulty accessing essential goods and services, exacerbating socioeconomic disparities and financial distress [24,26,27].

Societal Stigma and Misconceptions

CFS/ME is often stigmatized and marginalized within society, leading to misconceptions, disbelief, and discrimination against affected individuals. The portrayal of CFS/ME as a psychosomatic or "invisible" illness has contributed to skepticism regarding its legitimacy as a medical condition, hindering research funding, healthcare access, and societal support for affected people [25]. Furthermore, controversies surrounding alternative and complementary therapies, as well as conflicting narratives in the media, perpetuate confusion and uncertainty about CFS/ME among the public [24,28].

In response to the controversies and challenges faced by patients with CFS/ME, advocacy groups and research activists have played a crucial role in raising awareness, advocating for increased research funding, and promoting patient-centered approaches to care [28].

Conclusions

In conclusion, Chronic Fatigue Syndrome (CFS), also known as Myalgic Encephalomyelitis (ME), remains a challenging and often misunderstood condition with significant implications for individuals' health, well-being, and quality of life [28]. This literature review has provided valuable insights into the complex nature of CFS/ME, exploring its etiology, pathophysiology, clinical presentation, and management strategies. It is evident that CFS/ME is a multifaceted illness characterized by debilitating fatigue, cognitive impairments, and a range of other symptoms affecting various systems [29]. While the exact cause of CFS/ME remains elusive, current research suggests a multifactorial interplay of genetic, immunological, infectious, and environmental factors contributing to its onset and persistence [30,31].

In summary, this literature review underscores the importance of continued research efforts, interdisciplinary collaboration, and patient-centered approaches in addressing the complex challenges posed by CFS/ME. By advancing our understanding of the underlying mechanisms, refining diagnostic criteria, and exploring innovative treatment modalities, we can enhance the care and support provided to individuals living with CFS/ME and pave the way for improved outcomes and quality of life.

Disclosure

Authors contribution:

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Project Administration: Aleksandra Latała, Magda Przestrzelska

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