Acupressure and Quality of Life in Patients With Cancer-Related Fatigue

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Abstract

Cancer-related fatigue (CRF) is one of the most common and distressing symptoms experienced by individuals undergoing or recovering from cancer treatment. Unlike ordinary tiredness, CRF is persistent, multidimensional, and not fully relieved by rest. It significantly impairs physical functioning, emotional stability, cognitive performance, and overall quality of life. Despite advances in oncology care, effective management of CRF remains challenging, and pharmacological options often provide limited benefit. Consequently, there is increasing interest in complementary and integrative approaches such as acupressure. Acupressure is a non-invasive therapeutic technique that involves applying manual pressure to specific acupoints to regulate physiological balance and stimulate self-healing mechanisms. In the context of cancer-related fatigue, commonly targeted points include ST36 (Zusanli), SP6 (Sanyinjiao), and LI4 (Hegu), which are associated with energy regulation and systemic balance. This study examines the role of acupressure in reducing fatigue severity and improving quality of life among patients with cancer-related fatigue.

Keywords: Cancer-Related Fatigue (CRF); Acupressure; Quality of Life; Oncology Supportive Care

Introduction

Cancer-related fatigue (CRF) is one of the most prevalent and debilitating symptoms experienced by individuals undergoing cancer treatment or living in survivorship. Unlike typical fatigue that improves with rest, CRF is persistent, disproportionate to activity level, and often interferes with daily functioning. Patients frequently describe it as overwhelming physical, emotional, and cognitive exhaustion that affects work capacity, social engagement, and overall well-being. Studies suggest that a significant proportion of cancer patients, particularly those receiving chemotherapy or radiotherapy, report moderate to severe fatigue during and after treatment. The etiology of CRF is multifactorial. Contributing factors include anemia, inflammatory cytokine release, neuroendocrine dysregulation, sleep disturbances, nutritional deficiencies, pain, and psychological distress. Cancer treatments themselves can trigger systemic inflammation and hormonal imbalance, leading to prolonged fatigue symptoms. In addition, emotional stress, anxiety, and depression may intensify the perception of exhaustion through activation of the hypothalamic–pituitary–adrenal axis and autonomic imbalance. Conventional management strategies for CRF include exercise therapy, psychosocial interventions, sleep management, and in some cases pharmacological agents such as psychostimulants. Although structured physical activity programs have demonstrated benefits, adherence may be challenging for severely fatigued patients. Pharmacological treatments often provide limited relief and may carry side effects, highlighting the need for safe and supportive complementary interventions. Acupressure, a non-invasive technique derived

from traditional East Asian medicine, involves applying manual pressure to specific acupoints associated with systemic regulation and energy balance. From a biomedical perspective, acupressure may influence autonomic nervous system activity, modulate inflammatory responses, enhance endorphin release, and stabilize neuroendocrine function. These mechanisms are particularly relevant in the context of CRF, where inflammation, hormonal imbalance, and stress-related pathways play significant roles. Given the persistent impact of cancer-related fatigue on quality of life and the limitations of existing treatments, evaluating the effectiveness of acupressure as a complementary therapy is clinically important. This study aims to explore the role of acupressure in reducing fatigue severity and improving physical, emotional, and functional aspects of quality of life among patients experiencing cancer-related fatigue.

Epidemiology and Impact on Quality of Life

Cancer-related fatigue (CRF) is among the most frequently reported symptoms in oncology care. Prevalence estimates indicate that approximately 60% to 90% of patients undergoing chemotherapy or radiotherapy experience moderate to severe fatigue at some point during treatment. Even after completion of therapy, a substantial proportion of survivors continue to report persistent fatigue months or years later. The variability in reported prevalence is influenced by cancer type, stage of disease, treatment modality, and assessment methods.

CRF affects individuals across all age groups and cancer diagnoses, though higher rates are often observed in patients receiving combination therapies or high-dose regimens. Advanced-stage disease, anemia, sleep disturbance, psychological distress, and comorbid conditions further increase susceptibility. Importantly, fatigue can occur independently of disease progression, underscoring its multifactorial nature.

Impact on Physical Functioning

Fatigue significantly reduces physical capacity and endurance. Patients often report difficulty performing routine activities such as walking, household tasks, or self-care. Reduced energy levels may lead to decreased participation in physical activity, which can further weaken muscular strength and cardiovascular function, creating a cycle of deconditioning.

Emotional and Cognitive Effects

Beyond physical symptoms, CRF contributes to emotional distress and cognitive impairment. Many patients experience irritability, reduced motivation, difficulty concentrating, and memory lapses. Persistent exhaustion can intensify anxiety and depressive symptoms, particularly when patients perceive fatigue as a loss of independence or personal control.

Social and Occupational Consequences

CRF frequently disrupts social relationships and professional life. Individuals may reduce work hours, take extended leave, or withdraw from social interactions due to limited energy. This can lead to financial strain and feelings of isolation. For survivors attempting to resume normal routines, persistent fatigue may hinder reintegration into daily life.

Quality of Life

Quality of life encompasses physical, psychological, and social well-being. Cancer-related fatigue negatively influences all these dimensions. Studies consistently demonstrate strong associations between higher fatigue severity and lower quality-of-life scores in oncology

populations. Unlike transient treatment side effects, CRF can persist long-term, making it a critical target for supportive interventions.

cancer-related fatigue is highly prevalent and profoundly affects multiple aspects of patients' lives. Its broad impact on physical function, emotional health, cognitive performance, and social engagement highlights the importance of comprehensive management strategies, including complementary approaches such as acupressure, aimed at improving overall quality of life.

Inflammatory and Neuroendocrine Mechanisms in Cancer-Related Fatigue

Cancer-related fatigue (CRF) is strongly linked to inflammatory and neuroendocrine dysregulation triggered by both the malignancy itself and its treatment. Unlike ordinary tiredness, CRF reflects complex biological alterations involving immune activation, hormonal imbalance, and central nervous system signaling.

1. Role of Inflammatory Cytokines

One of the most widely supported mechanisms underlying CRF is systemic inflammation. Cancer and its treatments, particularly chemotherapy and radiotherapy, can stimulate the release of pro-inflammatory cytokines such as interleukin-1 (IL-1), interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF-α).

These cytokines influence the central nervous system by crossing the blood–brain barrier or signaling through neural pathways. Elevated cytokine levels are associated with symptoms commonly observed in CRF, including reduced energy, decreased motivation, sleep disturbance, and cognitive impairment. This inflammatory response resembles "sickness behavior," a coordinated physiological reaction to illness.

2. Hypothalamic–Pituitary–Adrenal (HPA) Axis Dysregulation

The HPA axis plays a central role in stress and energy regulation. In CRF, alterations in cortisol secretion patterns have been observed. Some patients exhibit flattened diurnal cortisol rhythms or reduced responsiveness to stress.

Chronic inflammation can disrupt normal HPA axis feedback mechanisms, leading to hormonal imbalance. Because cortisol has anti-inflammatory properties, impaired regulation may perpetuate inflammatory activity, contributing to persistent fatigue.

3. Autonomic Nervous System Imbalance

Autonomic dysfunction is another contributing factor. Increased sympathetic activity and reduced parasympathetic tone have been documented in patients with CRF. Reduced heart rate variability, a marker of autonomic imbalance, has been associated with greater fatigue severity. Autonomic dysregulation may influence sleep quality, cardiovascular function, and energy metabolism, further exacerbating symptoms.

4. Neurotransmitter Alterations

Inflammatory cytokines can alter neurotransmitter metabolism, particularly serotonin and dopamine pathways involved in mood and motivation. Reduced dopamine signaling, in particular, has been implicated in diminished motivation and reward processing, which are key features of CRF.

5. Interaction Between Inflammation and Neuroendocrine Pathways

Inflammatory and neuroendocrine systems interact in a bidirectional manner. Persistent immune activation can alter hormonal signaling, while hormonal imbalance can further affect

immune function. This feedback loop may explain the chronic and multifaceted nature of cancer-related fatigue.

cancer-related fatigue arises from an intricate interplay between inflammatory cytokine activity, HPA axis disruption, autonomic imbalance, and neurotransmitter alterations. These mechanisms collectively affect both peripheral energy metabolism and central nervous system function. Understanding these biological pathways provides a scientific rationale for exploring complementary interventions, such as acupressure, that may modulate inflammation, autonomic tone, and neuroendocrine regulation.

Conclusion

Cancer-related fatigue is a pervasive and multifactorial symptom that extends beyond simple physical tiredness. It is closely linked to inflammatory activation, neuroendocrine imbalance, autonomic dysregulation, and psychological stress. These interconnected biological mechanisms disrupt energy regulation, mood stability, cognitive performance, and overall physiological balance, leading to a sustained decline in quality of life among patients undergoing or recovering from cancer treatment. The high prevalence and persistent nature of CRF underscore the need for comprehensive management strategies that address both biological and psychosocial dimensions. While conventional interventions such as exercise programs and psychosocial therapies provide benefit, many patients continue to experience residual fatigue. Complementary approaches, including acupressure, offer a promising supportive option. By potentially modulating inflammatory responses, enhancing parasympathetic activity, and stabilizing neuroendocrine function, acupressure may help alleviate fatigue and improve overall well-being. Although emerging evidence suggests positive effects on symptom reduction and quality-of-life measures, further rigorous randomized controlled trials are necessary to determine optimal treatment protocols and long-term outcomes. Integrating acupressure into multidisciplinary oncology care may contribute to a more holistic and patient-centered approach, ultimately improving functional recovery and quality of life in individuals affected by cancer-related fatigue.

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