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PSYCHOLOGICAL ASPECTS OF THE PATIENT WITH RHEUMATOID ARTHRITIS

I. Frydas*

Laboratory of Microbiology and Infectious Diseases, School of Veterinary Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece.

Correspondence to:
Prof. I Frydas,
Laboratory of Microbiology and Infectious Diseases,
School of Veterinary Medicine,
Aristotle University of Thessaloniki,
Thessaloniki, Greece.
e-mail: frydas@vet.auth.gr

ABSTRACT

Rheumatoid arthritis (RA) is an inflammatory autoimmune disease with risk factors of genetics, the female sex, and environmental factors. Lifestyle factors such as obesity, cigarette smoking, alcohol consumption, stress and low socioeconomic status may be implicated in the disease. RA patients have a reduced quality of life and are an economical and health burden for countries. Growing evidence shows that RA patients may present neurological disease with structural differences in the hippocampus and basal ganglia compared to individuals unaffected by RA. The disease involves the immune, nervous, and endocrine systems with physical and psychological discomfort. Emotional stress and anxiety make it a psychosomatic disease with organic damage aggravated by emotional factors. The constant fear and strong concern that afflicts the patient can lead to psychological, physical and mental discomfort. However, more studies need to be done on this topic to understand the real psychological state of the patient and how it is involved in RA. Here, in this article, we report some new evidence on the neurological state of the RA patient.

KEYWORDS: *neurology, rheumatoid arthritis, inflammation, immune system, psychological disorders, autoimmunity*

INTRODUCTION

Rheumatoid arthritis (RA) is an inflammatory autoimmune disease and a substantial global public health challenge. A recent study examining the worldwide incidence and burden of RA estimated approximately 20 million cases with 3.4 million daily adjusted life years globally (1).

Risk factors for the disease include genetic predisposition, the female sex, and environmental and lifestyle factors, including obesity, smoking, alcohol consumption, stress, and low socioeconomic status.

Patients with this systemic disease suffer from joint swelling and pain, with varying degrees of severity from patient to patient. In addition, RA is associated with various complications, including permanent joint damage that requires surgery, effects on the blood vessels with rheumatoid vasculitis, and Felty syndrome (2).

It is a chronic and progressive disease that begins to affect the small joints initially, followed by larger ones, and can progressively affect other systems such as the skin, eyes, heart, kidneys, and lungs. Bone, ligament, and cartilage damage is common, as well as deformities and severe pain.

RA may lead to compression and invasion of the spinal cord and peripheral nerves, which can cause myelopathy, radiculopathy, and entrapment neuropathies such as carpal tunnel syndrome. The cervical spine is frequently involved in

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RA and can be affected with diverse ranges of severity, with some studies indicating up to 80% prevalence in cases (3). The atlantooccipital joint, atlantoaxial joint, and subaxial joint can all be affected. There is inflammation and the synovial membranes of joints are affected, with the overproduction of synovial fluid that damages articular structures and ligaments (4). Consequently, there can be compression of the spinal cord, nerve roots, and cervical spine structural alterations. Spinal cord compression can affect the brainstem, spinal nerve roots, cranial nerves, and vertebral arteries (5).

Approximately 40% of RA patients have chronic pain (6) that has physical and psychological consequences, with patients having an increased risk for neurological disease and neuropsychiatric comorbidities. There is no cure for RA and the treatment aims to reduce pain and control joint damage.

RA patients have a reduced quality of life, impacted by the negative physical and mental effects of the disease (7). In turn, patients have an increased rate of use of healthcare resources (8) and psychological disorders such as major depression (9), anxiety (10), and additionally, an increased risk of developing neurodegenerative disease (11).

Neurological disease and structural differences in the brain of RA patients

In RA, the adaptive immune system and the innate immune system interact in a complex mode that involves T-cells, autoantibodies, myeloid cells, and proinflammatory cytokines. There is bidirectional communication between the peripheral and central immune responses that can lead to neuroinflammation and central nervous system (CNS) comorbidity in RA patients (12).

Research has shown structural differences in the brains of RA patients, with changes in the hippocampus and basal ganglia that are not present in healthy, non-arthritic individuals.

Insulin-like growth factor 1 receptor (IGF1R) signaling is enriched in microglia of the hippocampus, and abnormal IGF1R signaling was seen in experimental studies to be associated with hippocampal neurogenesis, reduced hippocampal size, and decreased mobility. Blocking IGF1R was seen to provide some improvement, indicating that hippocampal damage could be reversible to some extent (13).

Another study showed that RA patients with long disease duration had increased ventricle-to-brain ratios in addition to decreased midsagittal cerebellar areas, which may link cerebral and cerebellar atrophy to the disease (14).

Research has also shown changes in the subcortical grey matter of RA patients in the basal ganglia, an area involved in motor control, pain processing, and behavioural response to stimuli, which could be the consequences of chronic pain and defects in motor control of these patients (15).

Pain is strongly linked with cognition and emotion, and imaging studies have shown that the emotional and attentional state can alter cerebral pain pathways, with chronic pain sufferers displaying alterations in certain brain regions and showing amplified responses to nociceptive stimuli (15-17).

Chronic pain has been associated with structural changes in the brain, which has been documented in diverse studies (18-21).

Emotional factors of RA

Pain, fatigue, morning stiffness, and disability are often standard conditions for RA patients. Many patients feel constant fear and strong concern relating to pain and their condition, which leads to psychological and physical discomfort.

Chronic pain is characterized by significant emotional distress with feelings including anxiety, anger, frustration, and depressed mood. Somatization and catastrophizing are often common responses to chronic pain and these psychological responses can be destructive to the patient's well-being. These negative emotional states can hinder patient functioning in the presence of pain, fatigue, and other physical symptoms they are already experiencing.

RA patients are at increased risk for the development of neuropsychiatric comorbidities, including major depressive disorder (MDD) (9), anxiety (10), impaired cognitive performance (22), and neurodegenerative disease such as dementia (23). MDD is often involved, as the rate in RA patients is 17% (24). Studies have also shown conflicting results for the implication of RA in other neurodegenerative diseases such as Alzheimer's Disease (AD) (25) and Parkinson's Disease (PD) (26,27).

These psychiatric problems could be due to biological or inflammatory changes or psychological stresses that come with pain and the difficulty of living with medical adversity. But, most likely, it is a combination of these different factors that interact to produce neuropsychiatric comorbidity.

The anxiety, depression, and cognitive impairment that may affect RA patients are, in turn, harmful to their condition, as these disorders can affect responsiveness to treatment and are associated with greater disease activity.

CONCLUSIONS

The chronic musculoskeletal pain experienced in RA is described as "chronic pain in the muscles, bones, joints, or tendons that is characterized by significant emotional distress (i.e., anxiety, anger, frustration, and depressed mood) or functional disability" (28). This pain is subjective and influenced by biological, psychological, and social factors (28).

RA is a multifactorial disease that involves the immune system, nervous system, and endocrine systems, in which patients experience physical and psychological discomfort. The emotional stress and anxiety form RA as a psychosomatic disease, with organic damage that is aggravated by emotional factors.

Chronic pain is implicated in psychological disorders, particularly depression and anxiety, in a bidirectional manner. Chronic pain can initiate and exacerbate depression and anxiety, conditions which, in turn, directly affect the pain level in a negative manner. Peripheral inflammation and sensitization, and central sensitization, can lead to persistent pain. In fact, it was found that patients' negative emotions relating to their RA state impacted the level of pain they were experiencing (29).

The immune system is also involved in pain regulation. Chronic inflammation and the release of proinflammatory cytokines contribute to pain. In turn, inflammation is also involved in depression and anxiety (24). Proinflammatory cytokines, including interleukin-1 (IL-1), IL-6, and tumor necrosis factor (TNF) are seen to be increased in MDD (30). In the cerebrospinal fluid of RA patients, there are also increased levels of the proinflammatory cytokines IL-1, IL-6, and TNF, substances which have the potential to contribute to cognitive impairment, although more research is needed to elucidate the precise mechanisms (31-33).

Insulin sensitivity is also connected to inflammation, and RA patients have a high prevalence of insulin resistance, above 50%, which is associated with systemic inflammation and cytokine levels (34). Insulin receptors and IGF1R are implicated in neurogenesis and could be associated with neurological diseases, cognitive decline, and regional atrophy (35,36).

This evidence shows the psychosomatic nature of RA, involving psychological disorders, including depression and anxiety.

Conflict of interest

The author declares that they have no conflict of interest.

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