Low Vitamin D Levels can Effect the Balance of Immune Mediators in Fibromyalgia Syndrome

Pinar Ellergezen

Department of Immunology, Turkey, E-mail: dence: pinarhiz@gmail.com

Abstract

Objective: To investigate the relationship between vitamin D levels and inflammatory cytokine levels in patients with Fibromyalgia Syndrome (FMS).

Materials and Methods: 29 women with FMS who were diagnosed according to American College of Rheumatology (ACR) 2010 fibromyalgia diagnostic criteria and 25 healthy women as the control group was included in the study. Serum levels of vitamin D, Vitamin D Receptor (VDR) and Vitamin D Binding Protein (VDBP), and inflammatory cytokines (IL-2, IL-4, IL-6, IL-12, IFN-γ) were analyzed using by ELISA method. Widespread body pain, fatigue, morning stiffness, cognitive symptoms, somatic symptoms, Fibromyalgia Impact Questionnaire (FIQ) scores were evaluated in patients with FMS.

Results: Vitamin D, VDR, and VDBP levels were found to be higher in the healthy individuals compared to the patients with FMS

Fibromyalgia (FM) is a chronic pain disorder characterized by abnormal central sensory processing of pain signals which is thought to be related to interactions between different systems in the body. Pain pathways associated with cortical, immunological, hormonal, and neuronal changes in chronic pain, are potentially also influenced by vitamin D levels. Severe conditions such as fatigue, somnolence, hyperalgesia, cognitive dysfunctions, allodynia, anxiety, and depression are known symptoms of Fibromyalgia Syndrome (FMS) and recent studies have reported that the same symptoms are observed when vitamin D levels are low . The main functional background for vitamin D deficiency and regulation of pain processing is based on the presence of Vitamin D Receptor (VDR) and Vitamin D Binding Protein (VDBP) in many areas of the Human Central Nervous System (CNS) [4]. In the rat model, Vitamin D Binding Protein (VDBP) has been found in axonal projections in the lateral hypothalamus. The presence of VDR and VDBP in the hypothalamus is suggested as the mechanism by which

Vitamin D deficiency is implicated in the pathophysiology of chronic pain in FM [6]. The etiology of FMS is still not clear but recent studies have highlighted the role of interactions between the central nervous system, the hypothalamic-pituitary-adrenal axis, and the immune system in the pathogenesis of FMS.

The expressions of immune mediators such as cytokines have been linked to the pathogenesis and traits of FMS. Cytokines are messengers of the immune system that are involved in many physiological and pathological processes. Pro-inflammatory cytokines such as interleukin (IL)-6, IL-8, IL-17, tumor necrosis factor-alpha (TNF-α), and interferon-gamma (IFN-γ) promote inflammation, while anti-inflammatory cytokines, such as IL-4, IL-10, and IL 13, reduce inflammation and promote healing [11,12]. An imbalance or excessive production of these cytokines has been linked to different diseases and symptoms, ranging from fever to death and atherosclerosis to cancer [11-17]. Dysregulation of pro-inflammatory cytokines has also been linked to sickness behavior, such as pain perception, cognitive impairment, depression, and other neurologically related effects. It has been further suggested to use serum levels of cytokines as potential biomarkers in diseases, such as in rheumatoid arthritis.

Biography

It have more than 15 years of experience in medical and Pharma (incl. targeted therapy or immunotherapy) as well as other fields.