

THE IMPACT OF VITAMIN D LEVELS ON THE OXIDATIVE STRESS IN IRAQI RHEUMATOID ARTHRITIS PATIENTS

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ABSTRACT : This study was undertaken to look up the role of vitamin D in the oxidative stress present in Iraqi rheumatoid arthritis patients. The study includes 119 patients with rheumatoid arthritis, who were divided into four groups according to the level of vitamin D into : G1 (vitamin D severe deficient group ≤ 10 ng/mL, n = 31), G2 (vitamin D deficient group = 11–20 ng/mL, n = 30), G3 (vitamin D insufficient group = 21–30 ng/mL, n = 30) and G4 (vitamin D sufficient group > 30 ng/mL, n = 28). Vitamin D was measured by Roche Elecsys vitamin D total II assay, while total oxidant status (TOS) and total antioxidant status (TAS) were determined by Erel's methods. In the sera of rheumatoid arthritis patients with low levels of vitamin D (G1 & G2 groups) a highly significant increase was obvious in TOS ($p = 0.000$) compared with who had sufficient level of vitamin D (G4 group) and there was a significant increase ($p = 0.023$) in insufficient group (G3 group) when compared also with G4 group. Meanwhile a highly significant decrease in TAS in sera of each of G1, G2 and G3 groups in comparison to the G4 group ($p = 0.000$ in case of each of G1 & G2 and $p = 0.001$ in case of G3). The results of oxidative stress index (OSI) showed a highly significant increase ($p = 0.000$) in sera of each of G1 and G2 groups and a significant increase ($p = 0.002$) in G3 group in comparison to that of G4 group. This study revealed a counter balance between vitamin D and oxidants and confirms the role of vitamin D as antioxidant.

Key words : Rheumatoid arthritis, vitamin D, oxidative stress index, total oxidant status, total antioxidants status.

INTRODUCTION

Rheumatoid arthritis (RA) is a long-lived inflammatory disease of joints and reported to be one of autoimmune disorder, which is characterized by chronic proliferative synovitis that results in eventually destruction of bone (Tešija, 2003). It is a most common disease of connective tissue that is reported in 0.5-1.5% of the world population, and influenced by geographic locations (Jönsson, 2008). Iraqi population of RA was determined to be 1% (Alkazzaz, 2013), all ages can be influenced by this disease (Gibofsky, 2012). Even though, its etiology and pathogenesis stay unclear, the genetic and environmental factors were suggested to cause this disease (Nielen *et al.*, 2006).

Smoking cigarette is reported to be one of the environmental factors which considered the foremost frequent cause that foretells the disease susceptibility and its severity. The infectious agents and the difference in steroid hormones level like vitamin D (vit D) has been reported to make healthy persons suffered from RA (Kobayashi *et al.*, 2008).

The low level of vit D is considered as a worldwide

clinical problem, and it is usual in conditions that have influence on the joints (Plotnikoff and Quigley, 2003). A previous study recognized that low vit D levels were linked with the initial appearance of a number of rheumatic disorders (Cutolo, 2008). Many studies found a link between low vit D level and RA activity (Cutolo *et al.*, 2006; Grazio *et al.*, 2015). In contrast, discrepancies in the presence of such link has been reported by many other studies (Ediz *et al.*, 2011; Tetik *et al.*, 2010).

In spite of the accurate cause, the reactive oxygen species (ROS), that are a mainly important medical group created in the biological system was suggested to play a critical role in RA (Valko *et al.*, 2007).

Reactive oxygen species consist of all the chemical molecules that are produced by unfinished oxygen reduction. They are quick and very reactive molecules that react with themselves and with other molecules to get stability. ROS are formed throughout the metabolism of living cell and include both useful and harmful properties (Mateen *et al.*, 2016). Harmful properties of ROS are observed when a high level of free radicals present, or their removal by antioxidants become damaged. Such high