Biochem. Cell. Arch. Vol. 21, No. 1, pp. 1299-1306, 2021 | www.connectjournals.com/bca | *ISSN 0972-5075*
DocID: https://connectjournals.com/03896.2021.21.1299 | *eISSN 0976-1772*

INVESTIGATION OF NEUROFILAMENT LIGHT CHAIN, VITAMIN D AND CALCIUM IN IRAQI PATIENTS WITH MULTIPLE SCLEROSIS

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(Received 22 August 2020, Revised 19 October 2020, Accepted 25 October 2020)

ABSTRACT : Multiple sclerosis (MS) is a life-long debilitating disease of the central nervous system (CNS) due to very complicated etiology and characterized by heterogeneous pathophysiological and clinical manifestations with unknown etiology. neurofilament light chain (NEFL) reflect axonal loss .Other agents relate with an increased risk of developing MS include vitamin D deficiency and calcium. To study the neurofilament light chain as prognostic marker for disease progression,disability and activity in MS also vit. D deficiency as a risk factor for MS development. Fitty-six MS patients who were undergoing different disease-modifying therapies, age range between18 - 69 years were included in this study, in addition to 20 healthy volunteers their gender and age matched with patients group serve as a control group. Blood samples collected to assess serum levels of vit. D and Calcium by using spectrophotometer device and neurofilament light chain by Enzyme-Linked Immunosorbant Assay (ELISA). Serum levels of vitamin D and calcium in patients are significantly lower than in control group. While, the concentration of neurofilament light chain (NEFL) in the serum of patients is significantly higher than in control group. Also its level showed significant negative correlation with both vitamin D and calcium concentrations. BMI showed non-significant differences between patients and control, but high BMI values are recorded in patients who are treated with fingolimod and those who have more EDSS score. In MS patients the concentration of neurofilament light chain (NEFL) is significantly higher than in control group which could be a biomarker for activity and therapeutic reaction .In addition, the level of vit. D and calcium may have a role in the development of MS.

Key words : Multiple sclerosis, neurofilament light chain, vitamin D, calcium.

How to cite : Najwan N. Alzaidi, Khalid M. Salih and Nawfal M. Sheaheed (2021) Investigation of neurofilament light chain, vitamin D and calcium in Iraqi patients with multiple sclerosis. *Biochem. Cell. Arch*. **21**, 1299-1306. DocID: https://connectjournals.com/03896.2021.21.1299

INTRODUCTION

Multiple sclerosis (MS) refers to the scars (plaques or lesions) that are formed as a result of demyelination of nerve fibers in the central nervous system (CNS) when oligodendrocytes are unable to completely repair the cell's myelin sheath due to repeated attacks leading to less effective remyelination process (Chari, 2007; Young *et al*, 2010). Therefore, destruction of myelin sheath, and failure of remyelination process by oligodendrocytes lead to block the communication among different parts of the nervous system (Nakahara *et al*, 2012; Steinman, 2014). The disease characteristics include: physical, mental and sometimes psychiatric disturbances (Streber *et al*, 2016). Two reasons are in charge for MS to be appeared; destruction of myelin sheath, and failure of remyelination process by oligodendrocytes (Nakahara *et al*, 2012; Steinman, 2014). The MS characteristic features include: physical, mental and sometimes psychiatric disturbances (Compston and Coles, 2008; Streber *et al*, 2016). To evaluate the degree of neurologic impairment in MS patients, expanded disability Status Scale (EDSS) is a method of quantifying disability and monitoring changes in the level of disability (Kurtzke, 1983).

The Committee of US National Multiple Sclerosis Society (NMSS) provided standardized definitions for four MS clinical courses: relapsing-remitting (RRMS), secondary progressive (SPMS), primary progressive (PPMS), and progressive relapsing (PRMS) (Lublin and Reingold, 1996). While MS is not currently a curable disease, there are now, or are in progress, many disease-modifying therapies (DMTs). These DMTs thought to mainly suppress CNS autoimmune activity, but each treatment has its own mechanism of action and each treatment has a different efficacy and safety profile (Du