

## A Significant of Vitamin D and other Parameters in Patients with Multiple Sclerosis in Baghdad

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### Abstract

**Background:** Multiple Sclerosis patients (MS) were suffering from several neurological defect. Vitamin D deficiency increase the severity of MS disease. The aim of this study is to evaluate Vitamin D in Multiple Sclerosis patients (MS).

**Methodology:** Current study enrolled thirty patients suffering from MS, they were diagnosed by physician. For comparison thirty healthy individuals participated in this work. Vitamin D and liver function tests were measured.

**Result:** A highly significant decrease in Vitamin D level ( $12.44 \pm 5.6$  ng/ml) in MS patients when compared to control ( $32 \pm 6.4$  ng/ml), and significant increase liver function tests in MS disease as compare with healthy individuals.

**Conclusion:** Decrease of Vitamin D associated MS disease. There is an obvious proof that vitamin D may be important in MS pathophysiology.

**Keywords:** *vitamin D, Multiple Sclerosis (M.S.).*

### مستوى فيتامين (د) اللاعب الرئيسي لمرضية التصلب العصبي

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### الخلاصة

**الخلفية:** يعاني مرضى التصلب المتعدد (MS) من العديد من العيوب العصبية. نقص فيتامين (د) يزيد من شدة مرض التصلب العصبي المتعدد. الهدف من هذه الدراسة هو تقييم فيتامين د في مرضى التصلب المتعدد (MS).

**المنهجية:** الدراسة الحالية شملت ثلاثين مريضاً يعانون من مرض التصلب العصبي المتعدد ، تم تشخيصهم من قبل الطبيب المختص و للمقارنة ، شارك ثلاثون من الأفراد الأصحاء في هذا العمل. وتم قياس اختبارات الفيتامينات D ووظائف الكبد.

**النتيجة:** انخفاض كبير للغاية في مستوى فيتامين D ( $12.44 \pm 5.6$  نانوغرام / مل) في مرضى التصلب المتعدد مقارنةً بالتحكم ( $6.4 \pm 32$  نانوغرام / مل) ، واختبارات وظائف الكبد زيادة كبيرة في مرض التصلب العصبي المتعدد بالمقارنة مع الأفراد الأصحاء.

**الكلمات المفتاحية:** فيتامين د ، مرض التصلب المتعدد .

## Introduction

Multiple sclerosis, or MS, an autoimmune defect is a chronic silent disease effects on brain, nerves, spinal cord and eyes (optic nerves). It can leads to vision problems, uncontrolled in muscles movement, and also effect on other basic body functions [1]. The effects and symptoms of MS are often different for each person. Some patients with mild symptoms not need to treatment while others face problems in their daily lives [2]. MS occurs when the immune system attacks the myelin that surrounds the nerve fibers which lead to nerve damage. This damage leads to the non-delivery of nerve signals to the body correctly. MS can caused multi-defect as physical activity problem with spasm, vision impairments, poor control in bowel and bladder, sexual problem and other neurological problems [3].

Vitamin D is a steroid vitamin, or hormone act as chemical messenger in the body. Vitamin D release in skin when exposure to sunlight, but its secretion depends on several factors, including the geographical spot and the skin pigment and season [4]. Vitamin D deficiency leads to various problems affecting various organs such as nerves, skin, intestinal absorption and others. It has a major role in immune modulation. The fact that most immune cells respond to vitamin D deficiency causes dysfunction in their function by several ways such as targeting the immune cells genes, functions of immune cells (e.g. macrophage process) and VDR expression [5].

The effect of vitamin D on MS patients is thought to happen through its multi-effects on its role on immune system and inflammation process. The vitamin D (active form) is thought to enhanced innate immunity and change adaptive immunity and likely plays an important role in defense of host for infection. The vitamin D role in the development of brain and nerve system is obvious which limited by different factors as the age of subjects at time of vitamin D deficiency [6].

Studies in animals showed that the low in vitamin D levels in the pregnancy may relate to with changes in brain development, neuro-chemistry (e.g. dopaminergic neurotransmitter systems), gene expression, and behavior. In compassion, the decrease of vitamin D concentrations in adulthood is just to be associated with health problems and behavioral phenotypes. There are few studies and evidence to choose the greatest effect of vitamin D deficiency at different ages [7].

To study the effect of vitamin D deficiency on neurosurgery patients, animal models were examined during different periods: 1 Pregnancy and lactation 2 Childhood and adolescence 3 Adults. In juvenile rats and adolescents, vitamin D supplementation was associated with EAE attenuation, less severe CNS infection and deleteriation, fewer T cells. Expression of cytokine in examined mice is interesting that The Hague supplements the results of EAE disease in pre-natal and post-natal rats [8,9].

The Aim of the present study is that to evaluate the level of vitamin D in MS patients and to assess the effect of treatment on the liver efficiency.

### Material and Method

Current study enrolled Forty patients suffering from MS, they were diagnosed according to Neurology and Neuroscience Reports,2016 [10]. For comparison thirty healthy individuals participated in this work. Vitamin D and liver function tests (GOT, GPT and ALP) were measured. Volunteers collecting from Baghdad Teaching hospital \ MS Clinic, in the period from November to December 2017. The age ranged between 24 -34 years, all patients were fasting for 12-14 hrs. All patients were treated by Betaferon (2 inj/week). Vitamin D levels were measured by Cobas C111, Germany. Liver function tests were measured by Reflatrone (Roch Co.,Germany).

### Results

Table (1) shown the charecterstics of patients and healthy groups. Both age and BMI were matched between patients and control groups [ $p < 0.05$ ]. The female (n=18) significantly more than male(n=12). About 77 % from patients not have family history for MS.

**Table (1):** The patient's characteristics

Mean±SD	Patients N=40	Control N=30	p-value
Age	29±4.6	30±5.43	NS
BMI (Kg/m <sup>2</sup> )	27.8±2.1	26.7±3.5	NS
Gender Male Female	40% a 60% b	50% 50%	NS
Family History Yes No	33% a 77% b	-	-
Duration of disease (year)	2.84± 0.8	-	-

Table-2 shown the clinical characteristics of patients and healthy groups. There was a significant difference in serum vitamin D levels [ $<0.001$ ] in patients ( $12.44 \pm 5.6$  ng/ml) when compared to control ( $32 \pm 6.4$  ng/ml).

**Table (2):** The clinical features

Mean $\pm$ SD	Control group N=30	Patients group N=30	p-value
<b>Vit. D (ng/ml)</b>	$32 \pm 6.4$	$12.44 \pm 5.6$	$<0.001$
<b>ALP (IU\L)</b>	$108 \pm 22.62$	$112 \pm 15.54$	$>0.05$
<b>GOT (IU\L)</b>	$22 \pm 7.16$	$47 \pm 12.76$	$<0.05$
<b>GPT (IU\L)</b>	$27 \pm 8.24$	$50 \pm 15.35$	$<0.05$

There were a significant increase in both GOT and GPT in patients when compared to control ( $47 \pm 12.76$ ,  $50 \pm 15.35$  vs.  $22 \pm 7.16$ ,  $27 \pm 8.24$ , respectively), while there was no significant in ALP levels in patients when compared to control. [ $p > 0.05$ ], Table (2).

## Discussion

Current study was design to assess the levels of vitamin D in MS patients. There was a significant decrease in vitamin D levels in patients when compare to healthy group.

A recent study recorded that in MS patients; vitamin D deficiency was common [11]. There are direct relation between the disease severity and vitamin D levels..46-49 As well as, decrease in vitamin D levels show to be correlated with increase levels of disability41,47-52 as determined by the Expanded Disability Status Scale (EDSS). Usually, the EDSS consider as formula used to help in MS diagnosis, and the rang of score (0-10 score) [0= represent that patients with normal examination and activity and 10= in the case of death as a result for MS]. Several studies support this relation. One of them recorded that about 181 patients were divided according to EDSS scale; the value of scale directly correlated with serum vitamin D levels [12].

Other study was compared between MS patients who given interferon beta-1b treatment at early time with versus delayed beta interferon [13]. Several studies that dealt with vitamin D levels to MS progression cannot recorded that the more exposure to sun lighten the signs of MS, particularly given that severely MS patients less sun exposure, which lead to vitamin D deficiency.

Theoretically MS patients who are more susceptible to vitamin D deficiency because they avoid sun exposure, worsening their symptoms.

Therefore, determined the effects of vitamin D on disease activity and severity in MS patients requires randomized controlled trials (RCTs) [14]. MS usually rises with increasing latitude, which is negatively correlated with exposure to sunlight and vitamin D level [15], probability of MS is decrease in population which consume fish (oil fish rich with vitamin D) [16] and MS risk appear to reduce with moving from elevate to low ranges. Current study show that the liver enzyme significantly elevated. Interferon  $\beta$ -1a is the most commonly used treatment is the severity of the disease. Proved that the treatment slows down the deterioration of the disease and its development [17].

The most common side effects for interferon  $\beta$ -1a is flu symptoms. Liver function disorders, were association with MS patients who receiving interferon. The rate of exploitation on abnormal results of liver function ranged from 1-67% in different studies [17-19] so for MS patient recommended that regular liver function monitoring every 6 months at least [17]. In conclusion, vitamin D has an important role in several biological function so its deficiency may develop MS fast.

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