Original Research Article

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Association between age at onset of multiple sclerosis and vitamin D level in Saudi population

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ABSTRACT

Background: Several studies have shown an association between 25-hydroxyvitamin D (Vitamin D) levels and multiple sclerosis (MS). This study aimed to evaluate association between age at onset of Multiple Sclerosis and vitamin D level in Saudi population.

Methods: This cross-sectional study was performed in the Neurology Department king Fahd Military Hospital Jeddah in the Kingdom of Saudi Arabia (KSA) included 75 patients with MS and 99 healthy controls group matched for gender and age. Comparing vitamin D measurement in multiple sclerosis patients at the time of diagnosis with healthy controls group.

Results: We found no significant association between age at onset of multiple sclerosis and vitamin D level in Saudi population p value (0.723). However we also found that 74.66% of the sample Members who had MS and has a deficient of vitamin D and 83.83% people of the sample members didn't have MS, but vitamin D was deficient with them.

Conclusions: Study has revealed a high rate of vitamin D deficiency in patients with MS and in the controls group, as well Therese no clear relation to MS, Thus Therese no significant association between age at onset of multiple sclerosis and vitamin D level in Saudi population.

Keywords: Multiple sclerosis, 25-hydroxyvitamin D, Saudi Arabia, Vitamin D deficiency, Age at onset

INTRODUCTION

Multiple sclerosis (MS) is a chronic progressive demyelinating disease of the central nervous system characterized by delay in neural conduction. MS is a chronic immune-mediated disease in which both inflammatory and degenerative processes occur.

Neurodegenerative disorder can be explained by interplay of genetic and environmental risk factors, including modifiable lifestyle factors.³

Prevalence appeared to increase over time.⁴ There are more than 2 million individuals affected by MS worldwide.⁵

Studies have shown significant variation in prevalence from Europe, as high as 100 per 100,000, to Africa, as low as 0.5 per 100,000 (1). Worldwide, women are more likely than men to suffer from multiple sclerosis in a ratio of 2 to 1.6

MS presenting in the hospital setting is increased in KSA than reported previously. There are many factors underlying these changes, such as lifestyle modifications,

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changes in a certain environmental element, or simply an increased awareness and better diagnosis of the disease.⁷

The causes of MS are still partially unknown. It is thought that environmental factors trigger the autoimmune response in genetically susceptible individuals, in recent years research interest in modifiable lifestyle risk factors for MS risk and progression has increased, and some have postulated that MS may be a lifestyle disease.⁸

Research suggests that vitamin D or increased sun exposure may have a positive impact on reducing the risk of development/progression of neurodegenerative disorders.⁹

Several recent studies found that increased body exposure to sunlight is associated with a decreased risk of MS, especially if the sun exposure occurred during childhood and adolescence. In the last decade a large body of literature data between vitamin D deficiency and several central or peripheral neurodegenerative diseases, particularly MS.

The aim of this study to evaluate association between age at onset of multiple sclerosis and vitamin D level in Saudi population.

METHODS

This is single-center cross-sectional study was performed in the Neurology Department king Fahd military hospital Jeddah in the Kingdom of Saudi Arabia (KSA) included 75 patients with MS aged >14 year who fulfilled the McDonald criteria and had done vitamin D level test same time of diagnosis. The collected data was taken from medical records. The collected data included demographic features (age at time of study examination and gender, age at MS onset and vitamin D measurement in multiple sclerosis patient at the time of diagnosis and comparing it with healthy controls group subgroups them into vitamin d deficiency and sufficiency vitamin D deficiency is defined as 25-hydroxyvitamin D level of less than 20 ng per milliliter (50 nmol per liter). 12 the control group contain 99 healthy people matched for gender and age. Data collected from November 2017 to March 2018.

Measurement of vitamin D

The serum samples used in this study had been obtained during hospitalization for the first neurological episode, these had been collected by standard methods using highperformance liquid chromatography (HPLC).

Statistical methods

To analyze the study data, we used the Statistical Package for Social Sciences (SPSS), and conducted the following statistical tests and methods: We use frequency, percentages and crosstabs for independent variables of the study which allow us to identify the characteristics of the studied society and to determine the extent to which these characteristics affect the results of the study. These variables are (gender, age, vitamin D).

We use Spearman correlation coefficient to measure the correlation between age at onset of MS and vitamin D level.

RESULTS

Gender crosstabs Table 1 shows that (36.2%) of the sample are males, while (63.8%) are females.

Table 1: Distribution of the study sample according to (gender).

Gender	Frequency	Percentage (%)
Male	63	36.2
Female	111	63.8
Total	174	100%

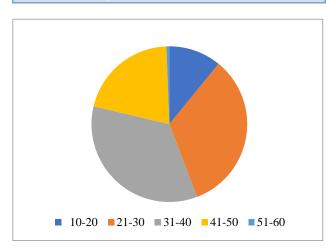


Figure 1: Distribution of the study sample according to age.

Age crosstabs Figure 1 shows that 10.9% of the sample are between 10-20 years, 33.3% between 21-30, 34.5% between 31-40, 20.7% between 41-50 while 0.6% are between 51-60.

Table 2: Vitamin D and MS group cross-tabulation.

		Group		Total	
		MS	control	Total	
Vitamin D	Deficient	56	83	139	
	Sufficient	19	16	35	
Total		75	99	174	

According to the results of Table 2 the variable group that is crossed with vitamin D level shows that (56) 74.66% of the sample members suffers from the MS and has a

deficient of vitamin D and (83) 83.83% people of the sample members didn't have MS but vitamin D was deficient with them.

Table 3: Vitamin D and gender cross-tabulation.

		Gender		Total	
		Male	Female	1 Otal	
Vitamin D	Deficient	48	91	139	
	Sufficient	15	20	35	
Total		63	111	174	

According to the results of Table 3 variable gender that is crossed with vitamin D level shows that (48 males 81.98% and 91 females 76.19%) vitamin D was deficient with them, while (15 males and 20 females) vitamin D was sufficient.

Table 4: Correlations between vitamin D and MS.

		Vitamin D	MS
Vitamin D	Spearman correlation	1	-0.027
	Sig. (2-tailed)		0.723
	N	174	174
MS	Spearman correlation	-0.027	1
	Sig. (2-tailed)	0.723	
	N	174	174

After studying Table 4, we observe that the relationship between the vitamin D and MS is negative and statistically not significant (equal to 0.723) with a correlation level (-0.027) also the correlation coefficient is very week, and this indicates that the Association between age at onset of MS and vitamin D level by only (2.7%).

DISCUSSION

In this cross-sectional study, we found no significant association between age at onset of multiple sclerosis and vitamin D level in Saudi population p=0.723. This is not as expected many researches conduct effect of vitamin D in regulate function immune cells such as antigenpresenting-cells, T cells, B cells and monocytes as well as regulatory mechanisms connected to autoimmune diseases. ¹³

A study has done shown an association between vitamin D deficiency as a risk factor for MS the study includes 33,996 individuals of European descent from 15 cohorts the study shown lowered vitamin D level is strongly associated with increased susceptibility to MS $(p=7.7\times10-12)$.

In the other hand, There is study was conducted in Ireland in 632 MS cases from three different counties and 226 controls group the mean vitamin D levels were low

and did not differ between patients (38.6 nmol/l) and controls (36.4 nmol/l) from this we can conclude.MS probably relates to an interaction between genetic factors and vitamin D, and MS risk may be modified by vitamin D in genetically susceptible individuals.¹⁵

However, we also found that 74.66% of the sample Members who had MS and has a deficient of vitamin D and 83.83% people of the sample members didn't have MS, but vitamin D was deficient with them.

The cause of low vitamin D in the Saudi Arabia and middle east countries are most likely due to low vitamin D dietary intakes and decrease sun exposure, due to avoidance of the sun behaviors, use of concealing clothes for a cultural or religious issue. ¹⁶ This also probably explains why women in our study more commonly had vitamin D deficiency 81.98% compared by men 76.19%.

This endemic deficiency in vitamin D level may affect our result we recommend having a national vitamin D level range especially most of the patient how have vitamin D deficiency are asymptomatic.¹⁷

There are some methodological limitations, such as the small sample size from a single center, this relatively small sample size from a single hospital may lead to selection bias for patients. However, our patients came from many areas in the country and, that may Serves as the whole general Saudi population.

CONCLUSION

The study has revealed a high rate of vitamin D deficiency in patients with MS and in the controls group as well. Thus, vitamin D deficiency is not associated with MS in Saudi Arabia. Additional research is now necessary to better evaluate the role of the vitamin D in MS, as this can lead us towards prevention measurement. Also, we recommended having a bigger sample size in a multicenter study in Saudi Arabia.

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