

Original Research

Evaluation of Association Between Vitamin D and Multiple Sclerosis Relapse: An Institutional Based Study

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ANSTRACT

Background: Vitamin D is basically available from two sources: exposure to UV light of sun and dietary sources. Epidemiologic studies have shown that the prevalence of multiple sclerosis is more at higher latitudes and tends to be higher in areas where there is low exposure to ultraviolet light. The present study was aimed to determine the association between Vitamin D levels and multiple sclerosis relapse.

Materials and Methods: The study was conducted in the department of Neurology, B. J. Medical College, Ahmedabad, Gujarat (India) for 1 year duration. It enrolled all the subjects with more than 6 months' duration of multiple sclerosis and that was confirmed by McDonald's criteria. Clinical characteristics of all the MS subjects were obtained from the hospital records. The EDSS score of all the subjects was obtained at the time of serum collection. The basic features of all the patients like age, Gender were also noted. All the data obtained was arranged in a tabulated form and analyzed using SPSS software. Data was arranged as percentage. The levels of Vitamin D were noted in Nmol/L.

Results: There were 21 males and 29 females in the study. The mean age of the study population was 45.87±11.29 years. The mean EDSS study of the sample was 4.5 ±2.1. There were 60% subjects of multiple sclerosis with suboptimal levels of vitamin D and 32% subjects had normal levels of vitamin D.

Conclusion: The therapeutic values of vitamin D are yet to be explored. In our study, the subjects with multiple sclerosis had lower levels of vitamin D.

Keywords: Vitamin D, Exposure, UV Light.

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INTRODUCTION

Multiple sclerosis is an inflammatory condition of the central nervous system and has affected over 2 million people around the world,¹ and it is the most frequent cause of neurological disability amongst young adults.² The triggering of multiple sclerosis is by a combination of environmental forces and genetic factors.³ Vitamin D is basically available from two sources: exposure to UV light of sun and dietary sources. Vitamin D exerts widespread effect on skeletal and non-skeletal system, including the effects on immune system of our body, has developed variably over the past three decades of life. Increased level of

vitamin D have found to be associated with decreased chances of developing multiple sclerosis, and have also reduced clinical activity in cases with previously existing multiple sclerosis, including decrease in relapse rates and reduced activity in brain MRI.^{4,5} Supplementation with Vitamin D reduces the risk of multiple sclerosis amongst the general population as well as amongst the newly borns when the mothers are supplemented before and during pregnancy.⁶ Epidemiologic studies have shown that the prevalence of multiple sclerosis is more at higher latitudes and tends to be higher in areas where there is low exposure to ultraviolet light.⁷⁻¹² Also, it has been

noticed that diets with Vitamin D enriched oily fish also decrease the risk.^{7,8} Historical cohorts have shown that amongst people migrating from high to low latitudes there is decreased risk of multiple sclerosis.¹³ The present study was aimed to determine the association between Vitamin D levels and multiple sclerosis relapse.

MATERIALS AND METHODS

The study was conducted in the department of Neurology, B. J. Medical College, Ahmedabad, Gujarat (India) for 1 year duration. It enrolled all the subjects with more than 6 months' duration of multiple sclerosis and that was confirmed by McDonald's criteria. Both males and females were enrolled in the study. The study was approved by the Institute's ethical board and all the subjects were informed about the study and written consent was obtained from all. Under complete aseptic conditions blood samples were obtained. Serum was used to estimate the levels of Vitamin D. Vitamin D levels of less than 70 nmol/L are responsible for causing osteoporosis. So, in this study, Vitamin D levels less than were considered as suboptimal. Clinical characteristics of all the MS subjects were obtained from the hospital records. The EDSS score of all the subjects was obtained at the time of serum collection.

The basic features of all the patients like age, Gender were also noted. All the data obtained was arranged in a tabulated form and analyzed using SPSS software. Data was arranged as percentage. The levels of Vitamin D were noted in Nmole/L.

RESULTS

The study enrolled 50 subjects over the period of 1 year. There were 21 males and 29 females in the study. The mean age of the study population was 45.87±11.29 years. The mean EDSS study of the sample was 4.5 ±2.1. There were 46% cases of Relapsing remitting MS, 30% cases of Secondary progressive MS, 16% cases of Primary progressive MS. The type of MS was unknown in 8% of cases. (table 1)

Table 2 shows the levels of Vitamin D amongst the subjects. There were 60% subjects of multiple sclerosis with suboptimal levels of vitamin D and 32% subjects had normal levels of vitamin D. There were 47.8% subjects with relapsing remitting MS with suboptimal levels and 52.2% had optimal levels. There were 86.7% subjects with secondary progressive MS with suboptimal levels and 13.3% had optimal levels. There were 75% subjects with primary progressive MS with suboptimal levels and 25% had optimal levels.

Table 1: Baseline characteristics of the subjects

VARIABLE		VALUE
Male		21
Female		29
Age		45.87±11.29 years
EDSS score		4.5 ±2.1
Type of MS	Relapsing remitting MS	23(46%)
	Secondary progressive MS	15(30%)
	Primary progressive MS	8(16%)
	Unknown	4(8%)

Table 2: Levels of Vitamin D

Vitamin D level	Relapsing remitting MS	Secondary progressive MS	Primary progressive MS	Total
Suboptimal level (<70 nmol/L)	11(47.8%)	13(86.7%)	6(75%)	30 (60%)
Optimal level	12(52.2%)	2(13.3%)	2(25%)	16(32%)

DISCUSSION

A combination of genetic and environmental factors is responsible for causing multiple sclerosis.¹⁴ According to a recent survey, vitamin D is a crucial nutrient obtained from the environment.¹⁵ It is photosynthesized by sunlight in the skin. It is basically found in 2 forms in the human circulation: 25-dihydroxy vitamin D i.e. the principal form and a biologically active metabolite 1,25-dihydroxyvitamin D. The 1,25-dihydroxy vitamin D is produced by hydroxylation of the other form within the kidneys.¹⁶ Vitamin D exerts effects on

skeletal and non-skeletal body system, and also has effect on immune system of our body. This has developed over the period of past three decades of life. Increased level of vitamin D have found to be associated with decreased chances of developing multiple sclerosis, and have also reduced clinical activity in cases with previously existing multiple sclerosis, including decrease in relapse rates and reduced activity in brain MRI.^{4,5} As per the study by Souliu-Hänninen, et al., who investigated the relapse rate before estimating the level of vitamin D found that

subjects with lower level of vitamin D had higher relapse rate as compared to other subjects. The smaller sample size of the study showed no significant difference between the groups.¹⁷ According to our study, there were 60% subjects of multiple sclerosis with suboptimal levels of vitamin D and 32% subjects had normal levels of vitamin D. There were 47.8% subjects with relapsing remitting MS with suboptimal levels and 52.2% had optimal levels. There were 86.7% subjects with secondary progressive MS with suboptimal levels and 13.3% had optimal levels. There were 75% subjects with primary progressive MS with suboptimal levels and 25% had optimal levels. In another study, low levels of circulating Vitamin d amongst adolescents were also correlated with higher risk of developing multiple sclerosis.¹⁸ Another study reported lower level of circulating Vitamin D amongst the multiple sclerosis patients compared to the controls.¹⁹ Though the role of Vitamin D in causing and preventing multiple sclerosis is not clearly defined. There have been studies indicating their association, but the results are not yet significant. The present study also had smaller sample size and duration of follow up. The study only included subjects reporting to the clinic for 1 year. These were the few drawbacks of the present study.

CONCLUSION

Vitamin D levels play an important role in the body functions. However, its role in multiple sclerosis has not been clearly defined. The therapeutic values of vitamin D are yet to be explored. In our study, the subjects with multiple sclerosis had lower levels of vitamin D.

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