

Evaluate the Deficiency of Vitamin D in Patients Presented with Multiple Sclerosis

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ABSTRACT

Aim: To examine the prevalence of vitamin D deficiency in patients with multiple sclerosis.

Study design: Cross-sectional/observational

Place and duration of study: Department of Medicine, Chandka Medical College Hospital, Larkana from 1st January 2020 to 30th September 2020.

Methodology: Seventy patients of both genders with ages 20 to 70 years presented with multiple sclerosis were enrolled. Patient's demographics including age, sex, residence, disease duration and type of multiple sclerosis were recorded after taking written consent. 5ml blood sample was taken from each patient and sent to laboratory to examine vitamin D level.

Results: Forty two (60%) patients were females and 28 (40%) were males with mean age of 47.28±14.7 years. Mean duration of disease was 5.32±0.48 years. Majority of patients 40 (57.14%) had urban residency. Twenty four (34.29%) patients had low socio-economic status and 35 (50%) patients had middle status. Most common type of multiple sclerosis was relapsing remitting multiple sclerosis in 55 (78.57%) patients.

Conclusion: The frequency of deficiency of vitamin D was very high in our study population. Patients with secondary progressive multiple sclerosis had high rate of deficiency of vitamin D.

Keywords: Multiple sclerosis, Primary progressive multiple sclerosis, Relapsing remitting multiple sclerosis,

INTRODUCTION

Multiple sclerosis is a common chronic inflammatory autoimmune disease of the central nervous system that causes severe motor and sensory impairment.¹With more than two million people affected worldwide, multiple sclerosis is considered the leading cause of non-traumatic disability in young adults.² Its prevalence varies between 0 and 350 per 100,000 populations, depending on ethnic origins³.

A complex interaction between genetic and environmental factors may explain the geographical variations of multiple sclerosis prevalence, and vitamin D deficiency may be a major contributor to multiple sclerosis susceptibility and severity.⁴ Indeed, three factors closely linked to vitamin D status have been reported to be involved in the incidence of multiple sclerosis all over the world.⁵ The first is sunlight exposure: an inverse correlation is present between levels of past exposure to sunlight and risk of multiple sclerosis onset and disease course.^{6,7} The second is latitude gradient: an increased distance from the equator increases the frequency of the disease⁸. These two factors are interrelated, as the latitude of a given region has an influence on its amount of sunlight. Finally, the third factor is dietary vitamin D intake: high levels of vitamin D in the diet appear to have a protective effect against multiple sclerosis.⁹ As a result of all these considerations and the fact that vitamin D plays a role in a variety of immune functions, such as cell proliferation, differentiation and immunomodulation¹⁰, vitamin D levels may well have an important role in the pathogenesis of multiple sclerosis¹¹.

Moreover, Ascherio et al¹² have shown that administration of the hormonally active form of vitamin D can prevent the onset and progression of experimental autoimmune encephalomyelitis (EAE), the animal model of multiple sclerosis. The present study was conducted aimed to examine the deficiency of vitamin D in patients presented with multiple sclerosis.

MATERIALS AND METHODS

This cross-sectional/observational study was conducted at Department of Medicine, Chandka Medical College Hospital, Larkana from 1st January 2020 to 30th September 2020. A total of 70 patients of both genders with ages 20 to 70 years presented with multiple sclerosis were enrolled in this study. Patient's demographics including age, sex, residence, socio-economic status, disease duration and type of multiple sclerosis were recorded. Patients with chronic heart disease, renal failure patients, patients with endocrine disorder and patients on vitamin D therapy were excluded. 5ml blood sample was taken from all the patients and sent to laboratory for examine vitamin D level. Serum hydroxyl vitamin D <20ng/ml was considered as deficiency of vitamin D. Data was analyzed by SPSS 24. Chi-square test was applied for stratification of Vitamin D with types of multiple sclerosis. P-value <0.05 was set as significant.

RESULTS

Forty two (60%) patients were females and 28(40%) were males with mean age of 47.28±14.7 years. Mean duration of disease was 5.32±0.48 years. Mostly patients 40(57.14%) had urban residency and 30(42.86%) had rural residency. 24(34.29%) patients had low socio-economic

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status, 35 (50%) patients had middle and 11(15.71%) had high socio-economic status (Table 1)

According to the types of multiple sclerosis the most common was relapsing remitting multiple sclerosis (RRMS) in 55(78.57%) patients followed by secondary progressive in 11(15.71%) and primary progressive in 4(5.71%) patients respectively (Table 2)

Vitamin D deficiency was observed in 29(41.43%) patients while 41(58.58%) patients were not deficient (Table 3). According to the stratification we found 22(40%) patients had vitamin D deficiency with relapsing remitting multiple sclerosis, among 11 secondary progressive multiple sclerosis patients 6(54.55%) had vitamin D deficiency and among 4 primary progressive patients 1 (25%) were vitamin D deficient (Table 4).

Table 1: Demographic information of the all the patients

Variable	No.	%
Age (years)	47.28±14.7	
Disease duration (years)	5.32±0.48	
Gender		
Male	28	40.0
Female	42	60.0
Residence		
Urban	40	57.14
Rural	30	42.86
Socioeconomic status		
Low	24	34.29
Middle	35	50.0
High	11	15.71

Table 2: Distribution of patients according to the types of multiple sclerosis

Type	No.	%
Relapsing remitting	55	78.57
Secondary progressive	11	15.71
Primary Progressive	4	5.71

Table 3: Frequency of vitamin D deficiency in multiple sclerosis patients

Vitamin D deficiency	No.	%
Yes	29	41.43
No	41	58.43

Table 4: Stratification of Vitamin D deficiency by type of MS

Type	Deficient	Not Deficient	P-value
RRMS (n=55)	20 (36.36)	35 (63.64)	N/S
SPMS (n=11)	8 (72.72)	3 (27.28)	0.001
PPMS (n=4)	1 (25)	3 (75)	N/S

DISCUSSION

Multiple sclerosis is commonly found neurological disorder in all over the world with high rate of complications and mortality.¹³ Vitamin D plays an important role in the management of multiple sclerosis and vitamin D deficiency is the major risk factor for developing complication in patients with multiple sclerosis.¹⁴ This study was conducted aim to examine the frequency of vitamin D deficiency in patient presented with multiple sclerosis. In this regard 70 patients were analyzed in which mostly patients were females 60% and prevalence of male patients was 40% with mean age 47.28±14.7 years. These results were similar to some previous studies in which female patients

were high in numbers as compared to males 60% to 75% and majority of patients had ages above 40 years.^{15,16}

In present study we found that the mean duration of disease was 5.32±0.48 years. Mostly patients 40(57.14%) had urban residency and 30(42.86%) had rural residency. Twenty four (34.29%) patients had low socio-economic status, 35(50%) patients had middle and 11(15.71%) had high socio-economic status. A study conducted by Esmaelet al¹⁷ reported that the mean duration of disease in patients of multiple sclerosis was 6.3±5.2 years. Some studies reported that patients with low socio-economic status had high prevalence of multiple sclerosis.¹⁸

In our study Vitamin D deficiency was observed in 29(41.43%) patients while 41(58.58%) patients were not deficient. A study conducted by Pechuhoet al¹⁹ reported that the frequency of vitamin D deficiency in multiple sclerosis patients was 20% among 85 multiple sclerosis patients. Another study conducted by Skalliet al²⁰ reported that hypovitaminosis D (vitamin D serum level <30 ng/mL) was observed in 97.3% of multiple sclerosis patients and in 98.6% of controls. Although the mean vitamin D serum level was slightly lower in patients (11.69 6.97 ng/mL) than in controls (12.98 6.58 ng/mL). Several studies demonstrated that vitamin D deficiency was the major risk factor among multiple sclerosis patients.^{21,22}

In present study we found 22(40%) patients had vitamin D deficiency with relapsing remitting multiple sclerosis, among 11 secondary progressive multiple sclerosis patients 6(54.55%) had vitamin D deficiency and among 4 primary progressive patients 1(25%) were vitamin D deficient. These results were comparable to some previous studies.^{23,24}

CONCLUSION

The frequency of deficiency of vitamin D was very high in our study population. Patients with secondary progressive multiple sclerosis had high rate of deficiency of vitamin D.

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