ORIGINAL ARTICLE

Determination of Serum Vitamin D Levels in Patients With Migraine

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ABSTRACT

Background: Migraine is multifactorial disease, due interaction of genetic and envoirnmental factors. These two are generally thought to be prime causative factors. A number of researchers reported that supplementation with D could be preventive strategy for development of migraine.
Aim: To find the association between migraine and vitamin D levels in the serum..
Methodology: This comparative, cross sectional study was conducted in the Department of Neurology, Nishtar Hospital, Multan, from January 2018 to June 2018. Newly diagnosed migraine patients (82 migraine patients) aged between 15 and 65 years, were consecutively enrolled. Serum levels of vitamin D were determined by ELISA technique.
Results: When we measured Mean±SD serum levels of vitamin D in patients and controls groups, the levels were slightly higher in group 1 (14.36±3.17) as compared to group 2(13.27±3.88). When we applied indepent t test to find statistical association between these two groups, it was non significant.
Conclusion: The findings of this studies show no statistical association between serum levels of vitamin D and migraine headache, and its different features.
Keywords: Migraine, headache, Vitamin D

INTRODUCTION

Headache common primary pain disorder, migraine, is thought to be the most frequent cause of vist to the physician for headache[1]. It is generally believed that almost 50% of the migrainous patients remain undiagnosed and this may be due to great variability in its clinical picture[2].

it is prevalent worldwide and is one of the foremost neurological complaint sought for medical treatment[3]. WHO has declared migraine as 19th most common cause of disability among all diseases[4]. Generally, it is considered to be a debilitating disease that considerably reduces the life quality of the patient suffereing from it[5,6]. it is reported in the literature that females suffer more with a 3:1 female to male ratio. The nature of pain due to migraine is recuurent, with severe and stabbing intensity affecting ipsilateral side of the head. Other common symtoms are nausea, vomiting, phonophobia and photophobia with severe recuurent attack pattern[8].

Migraine is multifactorial disease, due interaction of genetic and envoirnmental factors. These two are generally thought to be prime causative factors. A number of researchers reported that supplementation with D could be preventive strategy for development of migraine. They postulated this fact on basis that low mitochondrial energy may lead to rise in homocystiene levels, with ultimately can lead to migraine attacks[9].

Besides the well-established function on bone metabolism, decline in serum level of active vitamin D have been recently implicated in large number of human diseases, including infectious, cardiovascular, hormonal and malignant diseases, Parkash and his associates speculated that active serum vitamin D have role in the causation of migraine[10-15].The aim of this study was to find the association between migraine and vitamin D levels in the serum.

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MATERIALS AND METHODS

This comparative, cross sectional study was conducted in the Department of Neurology, Nishtar Hospital, Multan, from January 2018 to June 2018. Newly diagnosed migraine patients (82 migraine patients) aged between 15 and 65 years, were consecutively enrolled. Patients who were using vitamin D supplements, drugs affecting serum 25-hydroxy vitamin D [25(OH)D] levels were exclude from this study. Patients with history kidney liver or rheumatologic dysfunction were also not included as patient group. Gender and age matched 82 subjects were recruited as control group from the family members of patients with no history of migraine. A written informed consent was obtained from each patient and control. The study was approved by the Ethics Committee of Nishtar Medical College Multan.

Demographic data including age, sex, duration of sun exposure, place of residence, and level of education was obtained from both groups. Patients were evaluated with regard to their headache duration and headache frequency. Women were asked about menstrual aggravating effects on headaches. Five mL of venous blood was drawn from each participant and immediately centrifuged. Serum samples were then frozen and kept at minus 70 degrees centigrade.

ELISA technique was used to measure the serum levels of Vitamin D by using commercialy available ELISA kits. A micro plate reader set 450nm was used to read plates. A calibrators' curve was drawn by using ELISA reader's computer software.

The data was entered and analysed using SPSS version 20.0. The relationships between vitamin D status (mild and severe deficiency) and different categorized variables were investigated using the Independent t test. A p-value of ≤ 0.05 was considered as statistically significant.

RESULTS

Generalized characteristics of healthy subjects and patients with migraine are elaborated in table 1. When we measured mean±SDserum levels of vitamin D in patients and controls groups, the levels were slightly higher in group 1(14.27±3.01) as compared to group 2 (13.04±3.67). When we applied indepent t test to find statistical association between these two groups, it was non significant (Table 2). Bischoff-Ferrari and his colleagues (2006) classified their study subject with vitamin D deficiency into three categories i.e. deficient, insufficient and sufficient [16]. Thetable 3 shows the comparison of serum vitamin in both the study groups on the basis of sub-categorization given by Bischoff-Ferrari. The level of Vitamin D in migraine patients and healthy controls, in all the three categories was almost same. Similar to serum vitamin D level association between both the study groups, comparison among categories of vitamin D deficiency within the two groups was again insignificant (Table 3).

Family history of migraine is associated significantly with vitamin D status among cases and controls (Table 4). Prevalence of different features of migraine and their connotation with serum active vitamin D levelis compared in table 5. It is evident that vitamin D status is associated non significantly with different features of migraine.

Table 1: The generalized featutres of study subjects

Characteristics	Cases	Controls
Sample size 0	8	82
Age (mean±SD)	23±4.99	26±4.43
Gender		
Male	22(26.83%)	22(26.83%)
Female	60(73.13%)	60(73.3%)
Groups of sun light exposure		
0–120 min/day	60(73.17%)	62(75.66%)
≥120 min/day	22(26.73%)	22(26.73%)

Table 2: The mean serum levels and its comparison in study groups

Study groups	Serum Vitamin D Level (Mean±SD)ng/ml	P value
Group I	14.36±3.17	0.067
Group II	13.27±3.88	

Table 3: The comparison andCategorization of study subjects on the basis serum vitamin D level in both groups

Group (n)	Deficient (<20ng/ml)	Insufficient (20-29ng/ml)	Sufficient (≥30ng/ml)
Group I (82)	36	12	34
Group II (82)	34	14	34
Total (164)	70	26	60

Table 4: Comparison of family history of migraine headache in both groups

Groups (n)	Positive family history of migraine	No family h/o migraine
Group I (82)	10	72
Group II (82)	36	46
Total (164)	46	118

Table 5: Comparison ofdifferent characteristics of migraine patients with serum status of Vitamin D

Item (case)	Vitamin D level (ng/mL)		P value
Frequency of headache per month			
≤15	24(66.6%)	20 (58.8%)	0.840
>15	12(33.3%)	14 (42.2%)	
Nausea			
Yes	34 (94.4%)	20 (58.8%)	0.336
No	2 (5.6%)	14 (42.2%)	
Family history			
Positive	10 (27.7%)	16 (47%)	0.584
Negative	26 (62.3%)	18 (53%)	

*****sufficient level (more than 30 ng/mL) and deficient level (less than 200 ng/mL) in each category.

DISCUSSION

Ample economical and clinical burden of migraine is largely based on its high prevalence, that's why, is now regarded as a public healthcare issue[16,17]. Current scientific eveidence reports, although, a supposed link between migraine and serum level of vitamin D but this lack a solid scientific ground. The two non placebo controlled case reports, comprising of four women, reported a promising effect of vitamin D supplementation with the severity of migranous headache. A smaller sample size with lack of control of other confounding factors might be a limitation of reliability of the results of current study. As regards the observational investigations of current study, vitamin D was found deficient in patients with migraine (Table 3). It is worth mentioning that lower levels of serum vitamin D in overall population range from 22% to 42% across both geneders at diverse age[18,19], and these statistics are not really different from those reported in patients with migraine. It is pertinent to mention here the results of two cross sectional studies with entirely contradictory results about association of serum vitamin D deficiency and migranous headache. In one of these, neither the prevalence of vitamin D deficiency nor the concentration of total serum vitamin D was found to be significantly different between controls and patients with migraine[20]. In the other study, a substantialrelationship between active form of serum vitamin D was found in nonsmokers but not in smokers[21]. It is noteworthy, however, that the significance of this modest association was completely lost after adjustment for education level, age, physical exercise, body mass index and alcohol consumption, thus confirming that no apparent relationship exists between total serum vitamin D levels and migraine.

Knutsen and his associates reported that serum vitamin D level is more strongly related to migraine rather than other types of pain disorders. This conclusion is not in harmony with the results of current study[22]. Findings of current study have not demonstrated any relationship between the symptoms of migrane headache and serum vitamin D levels.Our results did not reveal any relationship between the severity of the vitamin D deficiency and severity of the headaches. Also, 25(OH)D plasma levels were not different among nausea, intensity of pain, pain tolerability, and disability.

The relationship between age and severity of vitamin D deficiency was established by Knutsen et al[22]. We found no relation between the age and levels of 25(OH)D. The prevalence related findings of current study show a similar deficiency among cases and controls which depicts a common underlying cause.

CONCLUSION

We may conclude from the findings of current study, no significant statistical association was found between serum level of vitamin D and migraine headache, and its different features.

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