

ORIGINAL ARTICLE**MIGRAINE AND VITAMIN D STATUS**Keenjher Rani¹, Urooj Bhatti¹¹Department of physiology, Liaquat University of Medical and Health Sciences, Hyderabad**Corresponding Author:****Dr. Keenjher Rani,**

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Article received on: 19-06-2020**Article accepted on:** 09-11-2020**ABSTRACT****BACKGROUND:**

Migraine had been well-known as the primary foremost debility cause for headache globally.

OBJECTIVE:

To determine the vitamin D status among the migraine patients with aura and without aura.

METHODOLOGY:

This cross-sectional comparative study has been conducted at LUMHS Jamshoro, from 6/6/2018 to 7/01/ 2020. This study comprised all male and female migraine patients of age group 18-45 years. Migraine was diagnosed conferring to strategies of international headache society. Exclusion criteria for this study were headache

other than migraine, neurologic deficit or psychiatric comorbidities, hypertensives, and diabetics. Informed consent taken from all the study participants prior to clinical consultation. Migraine patients inquired for severity of migraine on the basis of presence of aura and without aura, followed by clinical neurological examination. After taking all aseptic measures, 03 ml of blood taken intravenously in study population and referred to Diagnostic and Research Laboratory of LUMHS Jamshoro. Serum vitamin D3 levels determined by using 3L52 ARCHITECT 25 -OH Vitamin - D Reagent

kit. Vitamin D3 levels more than 75 ng/ml considered sufficient, while, 35 to 75 ng/ml as sub optimal and in the range of 20&30ng/ml as Vitamin D insufficiency and levels < 20 ng/ml considered deficient. The data entered in predesigned proforma and analyzed on SPSS 22.0. Vitamin D status compared among the migraine patients with aura and without aura by applying chi square test. Vitamin D3 levels compared between migraine patients with aura and without aura by applying independent t-test

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RESULT:

Mean age of migraine patients (n=84) was 32.3±3.5 years and out of them, 36(42.9%) were males and 48(57.1%) were females. Frequency % of vitamin D sufficiency was 7 (8.3%), sub-optimal was 22(26.2%), vitamin D insufficiency was 29(34.5%) and vitamin D deficiency was 29(31.0%). Out of 84 migraine patients, 69 were with aura and 15 were without aura. Out of 69 migraine patients with aura, 25(29.8%) were vitamin D deficient, 28(33.3%) were vitamin D insufficient, 13(15.5%) found with sub optimal levels and only 3(3.6%) with vitamin D sufficiency while among those without aura (n=15), 1(1.2%) were vitamin D deficient, 1(1.2%) were vitamin D insufficient, 9(10.7%) with sub optimal vitamin D levels and 4(4.8%) with sufficient vitamin D. (p value <0.01).

CONCLUSION:

Vitamin D has been revealed more deficient and insufficient in migraine patients with aura as compared to those migraineurs without aura.

KEYWORDS: Migraine, Vitamin D deficient, vitamin D sufficient

INTRODUCTION

Migraine had been well-known as the primary foremost debility cause for headache globally. A diversity of nutritional complements also been familiarized for the purpose of relieving from migraine; one of them is vitamin D which has anti-inflammatory as well as antioxidant properties and focus of research in current time.^{1, 2} Role of vitamin D in homeostasis of calcium as well as in bone metabolism had been proven fact while its part in migraine is center of controversy.³ Migraine is neurovascular ailment that distresses 6% of the males and 18% of female gender globally. Lack of numerous dietary agents in diet, i.e., magnesium, niacin,

cobalamin, co enzymes Q10, carnitine, alpha lipoic acid and vitamin D found to be associated with development of migraine. Some researchers postulate that mitochondrial dysfunction and impaired antioxidant status can cause migraine.⁴ Migraine with aura, has been connected to amplified hazard for developing ischemic cerebrovascular disease.⁵ In one of the randomized controlled trial study, Vitamin D3 revealed as significantly reducing the duration of migraine attack. Still, further research is required to explore and confirm about the prophylactic role of vitamin D in migraine.⁶ This study has been designed to determine the vitamin D levels among the migraine patients with aura and without aura.

METHODOLOGY

This cross-sectional comparative study has been conducted at LUMHS Jamshoro, from 6/6/2018 to 7/01/2020. The sampling technique was convenient purposive sampling. This study comprised all male and female migraine patients of age group 18-45 years. Migraine was diagnosed conferring to strategies of international headache society. Exclusion criteria for this study were headache other than migraine, neurologic deficit or psychiatric comorbidities, hypertensives, and diabetics. Informed consent taken from all the study participants prior to clinical consultation. Migraine patients inquired for severity of migraine on the basis of presence of aura and without aura, followed by clinical neurological examination. After taking all aseptic measures, 3 ml of blood taken intravenously in study population and referred to Diagnostic and Research Laboratory of LUMHS Jamshoro. Serum vitamin D3 levels determined by using 3L52 ARCHITECT 25 -OH Vitamin - D Reagent kit. Vitamin D3 levels more than 75 ng/ml considered sufficient, while, 35 to 75 ng/ml as sub optimal and in the range of 20&30 ng/ml

as Vitamin D insufficiency and levels < 20 ng/ml considered deficient. The data entered in predesigned proforma and analyzed on SPSS 22.0. Vitamin D status compared among the migraine patients with aura and without aura by applying chi square test. Vitamin D3 levels compared between migraine patients with aura and without aura by applying independent t-test.

RESULT

Mean age of migraine patients(n=84) was 32.3±3.5 years and they were 36(42.9%) were males and 48(57.1%) were females. Frequency % of vitamin D sufficiency was 7 (8.3%), sub-optimal was 22(26.2%), vitamin D insufficiency was 29(34.5%) and vitamin D deficiency was 26(31.0%). Mean and sd of vitamin D levels was 30.15±21.5nmol/lit. Out of 84 migraine patients,

69 were with aura and 15 were without aura.

Table No. 1

Vitamin D3 levels compared according to severity of migraine i.e., with aura and without aura and p value was 0.05 that is close to significant. **Table No. 2**

Out of 69 migraine patients with aura, 25(29.8%) were vitamin D deficient, 28(33.3%) were vitamin D insufficient, 13(15.5%) found with sub optimal levels and only 3(3.6%) with vitamin D sufficiency while among those without aura(n=15), 1(1.2%) were vitamin D deficient, 1(1.2%) were vitamin D insufficient, 9(10.7%) with sub optimal vitamin D levels and 4(4.8%) with sufficient vitamin D.(p value <0.01)

Table No.3

TABLE NO.1: DESCRIPTIVE STATISTICS OF MIGRANEURS (N= 84)

	Mean ±Sd	Frequency (%)
Age (in Years)	32.3±3.5	--
Gender		
Male	--	36 (42.9%)
Female	--	48 (57.1%)
Vitamin D sufficiency	--	7(8.3%)
Sub optimal	--	22(26.2%)
Vitamin D insufficiency	--	29(34.5%)
Vitamin D deficiency	--	26(31.0%)
Vitamin D levels(ng/ml)	30.15±21.5	--
Migraine with aura	--	69(82.1)
Migraine without aura	--	15(17.9)

TABLE NO. 2: VITAMIN D3 LEVELS IN MIGRANEURS WITH AURA AND WITHOUT AURA

	Migraine severity	N	Mean	Std. Deviation	P value ^a
Vitamin D3	with aura	69	28.07	20.1	0.05
	without aura	15	39.70	25.9	

TABLE NO.3 : COMPARISON OF VITAMIN D STATUS IN MIGRAINE PATIENTS WITH AURA(N=69) AND WITHOUT AURA (N=15)**Vitamin D staus * migraine Crosstabulation**

			Migraine		Total
			with aura	without aura	
Vitamin D Status	Vitamin D sufficiency	Count	3	4	7
		% of Total	3.6%	4.8%	8.3%
	Sub optimal	Count	13	9	22
		% of Total	15.5%	10.7%	26.2%
	Vitamin D insufficiency	Count	28	1	29
		% of Total	33.3%	1.2%	34.5%
	Vitamin D Deficiency	Count	25	1	26
		% of Total	29.8%	1.2%	31.0%
Total		Count	69	15	84
		% of Total	82.1%	17.9%	100.0%

P- value <0.01 with df=3 and pearson chisquare value=22.91

DISCUSSION

Migraine is one of the most common disabling neurological disorders. It is characterized by recurrent episodes of headache, variable in duration, intensity, and frequency, and is accompanied by nausea, vomiting, photophobia, and/or phonophobia. In some cases, migraine attacks are preceded by focal neurological symptoms called aura.⁷ In present study, among migraine patients with aura, 29.8% has been found with deficient vitamin D levels and 33.3% with vitamin D insufficiency.

Özer G. 8revealed that average vitamin D level was 7.4 ng/ml among patients with migraine with aura group and 8.5 ng/ml in patients with migraine without aura. Severe vitamin D deficiency was detected in 14 (66.7%) with aura. Similar to this study, Elsayed et al.⁷ also found deficient vitamin D levels in patients of migraine with aura. A variety of dietary supplements have been introduced for

migraine complementary treatment. As an anti-inflammatory and antioxidant agent, vitamin D is one of these agents which has been of interest in recent years. Even though, increased proportion of vitamin D deficiency and vitamin D insufficiency has been emphasized previously in past literature among the patients of migraine as related to controls, still, no consensus has been observed in recommending vitamin D practically in clinical practice.⁶ Migraine patients have a tendency to evade sunlight ultraviolet rays because of photophobia during migraine episode. Decreased physical activity and extended at work hours deceptively increase the risk for developing headache or migraine.^{9,10} Vitamin D is recommended to show significant part in release of dopamine and serotonin. Both dopamine as well as serotonin has been proposed as neurotransmitters which are involved in the pathogenesis of migraine. The occurrence of vitamin D receptors (VDR) in

hypothalamus (concerned with pain sensation), support the supposition of vitamin D influence in patients of migraine. VDR is nuclear protein and the associated gene is situated on chromosome 12q & this bears numerous polymorphisms.¹¹VDR with vitamin D binding protein in hypothalamus and existence of alpha 1-hydroxylase enzyme as well as and decreased magnesium levels are the mechanism about the connotation between Vitamin D deficiency and migraine. Because intestinal absorption of magnesium is dependent on Vitamin D.¹² Well-known role of calcium in contraction of smooth muscle cells in the walls of blood vessels causing vasoconstriction might provide a coherent connection of vitamin D deficiency with migraine attacks.⁵ Migraine headaches are one of the most common reason for disability globally, culminating in compromised quality of life with grave commercial consequences.¹³ Further research is the prerequisite of time to reveal about vitamin D status and role of other micronutrients in migraine patients to recover the quality of life among migraineurs in coming future.

CONCLUSION

Vitamin D has been revealed more deficient and insufficient in migraine patients with aura as compared to those migraineurs without aura.

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CONFLICT OF INCIDENCE

No conflict of interest declared by the authors.

AUTHORS' CONTRIBUTION

KR - Manuscript Writing

UB - Principal Investigator