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Original Research Article

Study of serum level of vitamin D2 (25 OH Vitamin D) in young stroke

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Abstract: The aim was to compare the serum concentration of 25–hydroxy-vitamin D level in ischemic cerebrovascular disease patients between (15-45) years of age. 50 patients who were admitted with Acute Ischemic Stroke between 15 to 45 yrs of age, within one month of first stroke were studied. Detailed evaluation for diabetes mellitus, hypertension, smoking, lipid profile, ECG, Echocardiography and Serum Vitamin D2 level was done. Diagnosis of ischemic stroke was confirmed by imaging studies of the brain. Out of 50 patients studied 36 were male and 14 female. Majority 70% of patients were having Vitamin D2 levels less than 15, followed by 24% were within 15 to 30, minimum 6% were having levels more than 30. Mean vitamin D2 level in our study was 14.24 ng/ml. Thus, we concluded that Vitamin D deficiency is a risk factor for stroke, thus early detection and proper treatment may help preventing ischemic cerebrovascular disease.
Keywords: Acute ischemic stroke, Vitamin D2

INTRODUCTION:

Stroke is defined by this abrupt onset of a neurologic deficit that is attributable to a focal vascular cause[1]. Two main types of stroke include ischemic stroke (85%) and hemorrhagic stroke (15%). Stroke is one of the leading causes of death and long term disability in general population. Stroke was the second most common cause of death worldwide in 2004, resulting in 5.7 million deaths (~10% of the total) [2].

Stroke in younger people is less common[3] but it is of great concern in the younger population because of the disability caused by it. Majority of authors refer “young stroke” to individuals developing stroke below 45 years of age. Recent studies have suggested that low serum vitamin D levels are associated with a variety of diseases, including cardiovascular disease and stroke.Possible mechanisms underlying this association include increased inflammation, rennin-angiotensin system upregulation, insulin resistance, altered lipid metabolism, and altered vascular smooth muscle growth and function that lead to hypertension, diabetes, dyslipidemia and atherosclerosis[4]. Stroke in young adults can be devastating for the affected individuals and their families. Hence, this study was undertaken to study relationship vitamin D2 and stroke.

AIM:

To compare the serum concentration of 25–hydroxy-vitamin D level in ischemic cerebrovascular disease patients between (15-45) years of age

OBJECTIVE:

- To find prevalence of risk factors leading to stroke
- To find the vitamin D2 levels
- To find etiology of stroke

METHODOLOGY:

This was a prospective study which included 50 patients having Acute Ischemic Stroke admitted in D. Y. PATIL Hospital, Kolhapur between periods of 2 years from May 2013 to April 2015. Patients between 15 to 45 yrs of age who had first stroke (Acute Ischemic Stroke) within one month were included. Detailed evaluation for diabetes mellitus, hypertension, smoking, lipid profile, ECG, Echocardiography and Serum Vitamin D2 level was done. Diagnosis of ischemic stroke was confirmed by imaging studies of the brain. Blood samples were taken within 24 hrs of onset of stroke and sent for biochemical analysis. Patients with subarachnoid hemorrhage and cerebral venous thrombosis, patients on Vitamin D/calcium supplementation, acute infections, vascular diseases,

kidney and liver disease, osteomalacia, parathyroid disorder were excluded.

RESULTS:

In our study majority of patients i.e. 72% (36) were males as compared to females which were 28% (14).62% of the respondents were in the age group of 31 to 40 years, followed by 26% were more than 40 years, and minimum12% were having their age less than 30years. Mean age was 37 years.Risk factors, majority 32% of the respondents were smokers, followed by 24% were alcoholic, followed by 14% were having hypertension and 12% were having diabetes mellitus and 8% had cardiovascular risk factor.

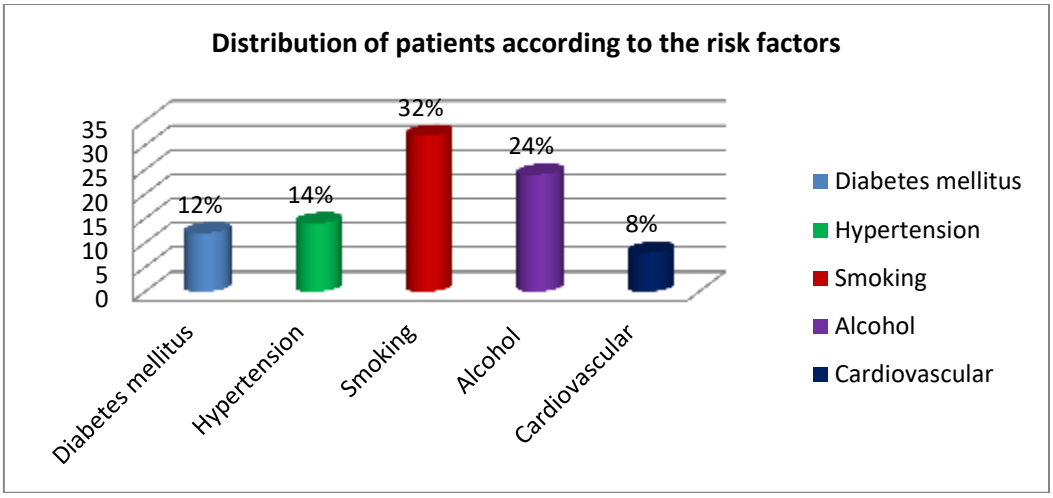

Fig 1: Distribution of patients according to the risk factors

Table 1: Distribution of patients according to the vitamin D2 levels

Vitamin D2 levels	Distribution (n=50)	
	Number	Percentage
Deficiency < 15	35	70.00
Insufficiency 15 to 30	12	24.00
Normal > 30	3	6.00
Total	**50**	**100.00**

Vitamin D2 levels - Majority 70% were having the levels less than 15, followed by 24% were within 15 to 30, minimum 6% were having levels more than 30. Mean vitamin D2 was 14. 24 ng/ml.

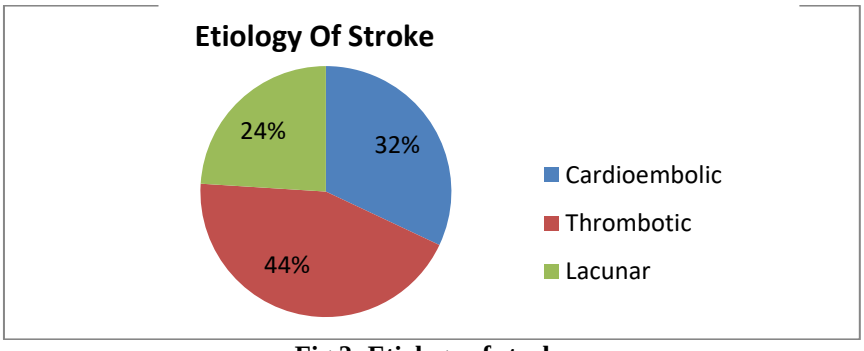

Fig 2: Etiology of stroke

Etiology of stroke, maximum 44% patients showed Thrombotic, followed by 32% Cardioembolic and 24% showed Lacunar stroke.

Table 2: Comparing etiology of stroke with the vitamin D levels among the study population

Vit D /Etiology	Cardioembolic	Thrombotic	Lacunar	Total
<15	12	18	5	35
15-30	3	3	6	12
>30	1	1	1	3
Total	16	22	12	50

Chi Square=6.6, Degree of freedom=4, P value=0.15

Out of 50 respondents, 35 were having Vit. D levels less than 15, out of which 12 had cardioembolic stroke, 18 had thrombotic stroke and 5 had lacunar stroke. 12 patients were having Vit. D levels within 15 to 30, out of which 3 had Cardioembolic stroke, 3 had thrombotic and 6 had lacunar stroke. 5 patients were having Vit. D levels within more than 30, out of which 1 each had cardioembolic, thrombotic and lacunar stroke.

Table 3: Comparing the levels of vitamin D and gender among the study population

Sex/Vit D	<15	15-30	>30	Total
Male	26	8	2	36
Female	9	4	1	14
Total	35	12	3	50

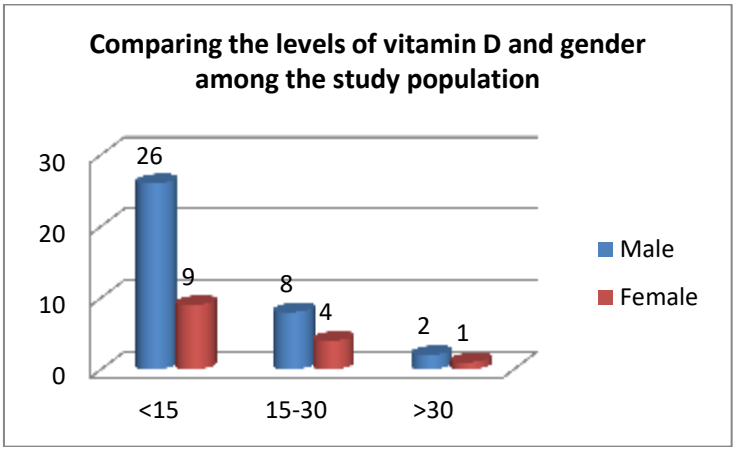

Fig 3: Comparing the levels of vitamin D and gender among the study population

Chi Square=0.3, Degree of freedom=2, P value=0.85

There were 36 males, out of which 26 patients had levels <15, 8 were within 15 and to30, 2 patients levels were greater than 30. 14 were female, out of which 9 patients had levels <15, 4 were within 15 and to30, 1 patient had greater than 30.

DISCUSSION:

Out of 50 patients 72% (36) were males and 28% (14) were females. This is consistent with studies conducted by JukkaPutaala*et al.;* [5],Tsong-Hai Lee *et al.;* [6] and P Nencini*et al.;* [7]. Most common well-documented risk factors for stroke were smoking, hypertension and diabetes. K Nedeltchev*et al.;* [8] and RuijunJi[9]also observed that these risk factors were associated with stroke in their studies. Diabetes Mellitus was observed in 12 % of patients. Hypertension was found in 14% of patients, cardiovascular risk factors were found in 8% while 32% of patients were smokers. 44% of young strokes were thrombotic whereas 32% were cardioembolic and 24 % were due to lacunar infarct. These findings corelated with studies conducted by Dayna Griffiths and Jonathan Sturm [10] who observed 28-35% ischemic stroke was due to cardioemboli. The mean Vitamin D2 levels among patients were 14.24 ng/ml. It was observed that vitamin D2 deficiency was seen in 70% cases (deficiency 70% & insufficiency 24%). Similar findings were seen in studies conducted by Kenneth E.S. Poole [11] Stefan Pilz[12] Gotaro Kojima [13] concluded that low levels of 25(OH)D and 1,25(OH)2D are independently predictive for fatal strokes.

CONCLUSION:

Thus from the above study we concluded that Vitamin D2 levels have association in the causation of stroke in young age. Correction of Vitamin D 2 may help in reducing the risk of stroke and in long run will improve quality of life.

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