Bangladesh Physiotherapy Journal

VOLUME-08, NUMBER-01, DECEMBER-2017

A Member Organization of WCPT

World Confederation for Physical Therapy

Official Journal of Bangladesh Physiotherapy Association (BPA)

www.bpa-bd.org
ISSN: 1727-6748

Level of Vitamin D among various age & sex groups at DPRC Hospital, Dhaka

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Abstract

Background:*The study Vitamin D among various age & sex groups at DPRC Hospital, Dhaka" conducted among 246 purposively selected male & female patients who visited Dhaka Pain & Rehabilitation Center (DPRC) hospital located at Ring Road, Shyamoli Adabor, Mohammadpur Dhaka from January - September, 2017. The study objective was to explore the vitamin D level in various age groups and sex.* ***Methodology:*** *It was a cross sectional study. The study also analyzed difference in vitamin D level among various age groups and sexes. The respondents were divided in various age groups (for example 1 - 20, 21 - 30 years). Vitamin D level was obtained through chemical test at DPRC laboratory using the blood sample of the patients participated in the study. A simple one page questionnaire was used to record the results. A total 246 respondents vitamin D level was tested using blood sample (52.0% male, 48.0% female) at Dhaka Pain & Rehabilitation Center (DPRC hospital) located at Ring road, Adabor Shyamoli, Mohammadpur, Dhaka.* ***Results:*** *Majority of the patients/respondents was in the age range from 31 - 60 years (22.4% in the age group 41 - 50 years, 21.5% in the age group 51 - 60 years & 17.5% in the age group 31 - 40 years. The mean age was 47.04 years, ranging from 4 to 90 years. Above half of the patient's vitamin D level (54.9%, 135) was in the range from 10 - 30 ng/ml, followed by 31 - 100 ng/ml with 40.2% (99 patients). Few were in the level 1 - 9 ng/ml (10 patients, 4.1%). Only 2 patients (08%) vitamin D level recorded above 100 ng/ml. The mean vitamin D level of 246 patients was 31.7683, ranging from 3.18 - 114.30 ng/ml. The vitamin D level 10 - 30 ng/ml was most evident among the both sexes. Though female patients were more prone to be within the vitamin D level 10 - 30 ng/ml than male (female 58.5%, 69 to 51.6%, 66). Vitamin D level ranging from 31 - 100 ng/ml was more prone to males than female patients (42.2%, 54 males to 38.1%, 45 females). Male patients were also more numerous in the vitamin D level 1 - 9 ng/ml than female (7, 5.5% to 3, 2.5%). Young respondents/patients (below 20 years) were found to possess vitamin D level better than older. The age group 1 - 20 years reported 46.1% (6 patients) with the vitamin D level 31 - 100 ng/ml, followed by 10 -30 ng/ml level with 38.5% (5 patients). The patients in the age group 21 - 30 years were mostly 10 -30 ng/ml vitamin D level 22 patients (71.0%), followed by 25.8% (8 patients). The age group 31 - 40 years also had shown the vitamin D level as the age group of young adults (24, 55.8% in the level 55.8% & 18, 41.9% in the level 31 - 100 ng/ml). The group 41 - 50 years showed 58.2% vitamin D level 10 -30 ng/ml & 36.3% in the level 31 - 100 ng/ml). 51 - 60 years showed the 49.0% (26 in 10 -30 ng/ml level) & 45.3% (24 in 31 - 100 ng/ml level). Half of the patients in the age group 61 - 70 years were in the level 10 -30 ng/ml & 47.0% (16 in 31 - 100 ng/ml). More than half 52.9% (9 patients) in the age group of above 70 years were in 10 - 30 ng/ml level & 41.2% (7 patients with 31 - 100 ng/ml).* ***Conclusion:*** *This study was important to explore the vitamin D level among various age and sex in Bangladesh who were suffering from pain, paralysis and related physical problems required physiotherapy. Over all younger patients were tend to possess better vitamin D level than the older age groups. More than half of the patient's vitamin D level were from 10 - 30 ng/ml express over all poor vitamin D level in Bangladesh.*

Key Words: Key Words: Vitamin D

[1&2]Consultant, DPRC Hospital

Introduction:

During the last decade, there has been a growing interest in the beneficial effects of vitamin D on a wide range of health outcomes. It is well-recognized that this nutrient plays an important role in bone mineralization and other metabolic processes in the human body such as calcium (Ca) and phosphate homeostasis and skeletal growth. Serum 25-hydroxyvitamin D [25(OH)D] concentration is the parameter of choice for the assessment of vitamin D status; as it reflects vitamin D exposure, incorporating endogenous synthesis from solar exposure, dietary intake from

foods, fortified products, and/or supplements. Although there are some areas of debate in relation to vitamin D requirements and the impact of vitamin D intake and status on many aspects of human health, there is a general agreement that prevention of vitamin D deficiency and insufficiency should be considered as a public health priority. Given its key role in skeletal health, adequate vitamin D status has important implications in bone loss, muscle weakness and falls and fragility fractures in older people. These are highly significant public health issues in terms of morbidity, quality of life and costs to health services.

Increasing evidence suggests that vitamin D has multiple biological functions in addition to the classical effects on calcium and phosphorus metabolism and on bone health and muscle strength. Vitamin D deficiency and insufficiency have been associated with non-skeletal diseases, such as depression, diabetes, heart failure, high blood pressure, rheumatoid arthritis, selected cancers, schizophrenia, and tuberculosis (Zittermann and Gummert, 2010; Schöttker et al., 2013). Although there is no consensus on the optimal vitamin D status, most specialists agree that its deficiency should be defined as serum 25-hydroxyvitamin D (25-OHD) levels at less than 50 nmol/L, insufficiency as levels between 50 and 75 nmol/L, and adequacy as levels at more than 75 nmol/L (Holick et al., 2011). The levels even higher than 100 or 150 nmol/L have been recommended based on epidemiologic data (Bischoff-Ferrari et al., 2006).

Vitamin D status in an individual is dependent on genetic inheritance, lifestyle, and geographical conditions. Systematic reviews revealed that vitamin D deficiency and insufficiency are prevalent in all ethnicities and age groups where data are available around the globe, even in those living in areas with low latitude where a high level of solar ultraviolet B radiation initiates significant photochemical synthesis of vitamin D in human skin and those residing in advanced countries where vitamin D fortification has now been implemented for years (Wahl et al., 2012; Palacios and Gonzalez, 2014). For example, 72% of school children aged 7-12 years in Kuala Lumpur, Malaysia had serum 25-OHD levels indicative of vitamin D deficiency (Khor et al., 2011). Results from the US National Health and Nutrition Examination Survey indicated that prevalence of vitamin D deficiency or insufficiency in the 12- to 15-year-old US population was 31% or 79%, respectively (Ganji et al., 2012). The situation is, however, still uncertain because information on 25-OHD levels, especially among infants, children, and adolescents, is strikingly lacking in various parts of the world including most of the Asia and Pacific region (Wahl et al., 2012; Palacios and Gonzalez, 2014).

Methodology:

The study was conducted among 246 purposively selected male & female patients at DPRC Hospital from January - September, 2017 with the objective of exploring the vitamin D level in various age groups and sex. The study analyzed difference in vitamin D level among various age groups and sexes. The respondents were divided in various age groups (for example 1 - 20, 21 - 30 years). Vitamin D level was obtained through chemical test at DPRC laboratory using the blood sample of the patients participated in the study. A simple one page questionnaire was used to record the results. It was a cross sectional study.

Results:

A total 246 respondents vitamin D level was tested using blood sample. Among the respondents males was slightly higher than female (52.0% male, 48.0% female). Majority of the patients/respondents was in the age range from 31 - 60 years, that is middle to little older in age. The largest frequency was observed for the age group 41 - 50 years (22.4%), followed by 51 - 60 years (21.5%) & the age group 31 - 40 years (17.5%). Among the remainder the age group 61 - 70 years was accounted in 13.8% cases and the young adult patients with the age group 21 - 30 years with 12.6%. The mean age was 47.04 years, ranging from 4 to 90 years. Above half of the patient's vitamin D level (54.9%, 135 out of total 246 patients) was in the range from 10 - 30 ng/ml, followed by 31 - 100 ng/ml with 40.2% (99 patients). Few were in the level 1 - 9 ng/ml (10 patients, 4.1%). Only 2 patients (08%) vitamin D level recorded above 100 ng/ml. The mean vitamin D level of 246 patients was 31.7683, ranging from 3.18 - 114.30 ng/ml.

Table 01: Sex, age & Vitamin D level frequency

	Frequency	Percentage	
Sex			
Male	128	52.0	
Female	118	48.0	
Total	246	100.0	
Age (Grouped) of the respondents			
1 - 20	13	5.3	Mean: 47.04 Std. Deviation: 16.165 Range: 4 – 90
21 - 30	31	12.6	
31 - 40	43	17.5	
41 - 50	55	22.4	
51 - 60	53	21.5	
61 - 70	34	13.8	
71 - 100	17	6.9	
Total	246	100.0	
Vitamin D level of the respondents			
1 - 9	10	4.1	Mean: 31.7683 Std. Deviation: 19.568 Range: 3.18 – 114.30
10 - 30	135	54.9	
31 - 100	99	40.2	
>100	2	.8	
Total	246	100.0	

Sex difference of various vitamin D level groups (for example 1 - 9 ng/ml, 10 -30 ng/ml group) was explored. The vitamin D level 10 - 30 ng/ml was most evident among the both sexes. Though female patients were more prone to be within the vitamin D level 10 - 30 ng/ml than male (female 58.5%, 69 out of total 118 female patients to 51.6%, 66 out of total 128 male patients). Vitamin D level ranging from 31 - 100 ng/ml was more prone to males than female patients (42.2%, 54 males to 38.1%, 45 females). Male patients were also more numerous in the vitamin D level 1 - 9 ng/ml than female (7, 5.5% to 3, 2.5%). One male and one female was found with the vitamin D level more than 100

Table 02: Sex difference in Vitamin D level among the respondents

		Sex		Total
		Male	Female	
Vitamin D Group	1 - 9	7 (5.5%)	3 (2.5%)	10
	10 -30	66 (51.6%)	69 (58.5%)	135
	31 - 100	54(42.2%)	45 (38.1%)	99
	101 - 300	1 (0.7%)	1 (0.9%)	2
Total		128 (100.0%)	118 (100.0%)	246

ng/ml.

Table 03: Difference of vitamin D level according to age

		Vitamin Dgroup				Total
		1 – 9 ng/ml	10 -30 ng/ml	31 – 100 ng/ml	101 – 300 ng/ml	
Age Group (years)	1 - 20	2 (15.4%)	5 (38.5%)	6 (46.1%)	0	13 (100.0%)
	21 - 30	1(3.2%)	22 (71.0%)	8 (25.8%)	0	31 (100.0%)
	31 - 40	1(2.3%)	24 (55.8%)	18 (41.9%)	0	43 (100.0%)
	41 - 50	3 (5.5%)	32 (58.2%)	20 (36.3%)	0	55 (100.0%)
	51 - 60	3 (5.7%)	26 (49.0%)	24 (45.3%)	0	53 (100.0%)
	61 - 70	0	17 (50.0%)	16 (47.0%)	1 (3.0%)	34 (100.0%)
	71 - 100	0	9 (52.9%)	7 (41.2%)	1 (5.9%)	17 (100.0%)
Total		10	135	99	2	246

Difference in vitamin D level in various age groups was analyzed. Young respondents/patients (below 20 years) were found to possess vitamin D level better than older. The age group 1 - 20 years reported 46.1% (6 patients) with the vitamin D level 31 - 100 ng/ml, followed by 10 -30 ng/ml level with 38.5% (5 patients). Young adults in the age group 21 - 30 years were mostly in the range 10 -30 ng/ml vitamin D level 22 patients (71.0%), followed by 25.8% (8 patients). The age group 31 - 40 years also had shown the vitamin D level as the age group of young adults (24, 55.8% in

the level 55.8% & 18, 41.9% in the level 31 - 100 ng/ml). The age group 41 - 50 years showed 58.2% (32 patients in the vitamin D level 10 -30 ng/ml & 36.3% (20 patients in the level 31 - 100 ng/ml). The age group 51 - 60 years also showed the same vitamin D level, 49.0% (26 in 10 -30 ng/ml level) & 45.3% (24 in 31 - 100 ng/ml level). Half of the patients in the age group 61 - 70 years were in the level 10 -30 ng/ml& 47.0% (16 in 31 - 100 ng/ml). More than half 52.9% (9 patients) in the age group of above 70 years were in 10 - 30 ng/ml level & 41.2% (7 patients with 31 - 100 ng/ml).

Conclusion:

This study was important to explore the vitamin D level among various age and sex in Bangladesh who were suffering from pain, paralysis and related physical problems required physiotherapy. Over all younger patients were tend to possess better vitamin D level than the older age groups. More than half of the patient's vitamin D level was from 10 - 30 ng/ml express over all poor vitamin D level in Bangladesh.

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