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Research Article

**A COMPREHENSIVE STUDY ON BIOCHEMICAL ANALYSIS
AND FREQUENCY OF VITAMIN D DEFICIENT PEOPLE**Dr. Waleed Anwaar¹, Dr. Muhammad Saim Ashiq¹, Dr. Ahmed Muaaz Umer¹¹Nishtar Hospital Multan.

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Abstract:

Objectives of the study: The basic objective of the study is to analyze the biochemical profile and frequency of vitamin D deficient people.

Methodology of the study: This cross sectional study was conducted in Nishtar Hospital Multan during February 2018 to November 2018. The data was collected from 100 vitamin D deficient people who visited the OPD of the hospital regularly. One blood sample of 5ml was obtained from each patient. Blood tests were performed in the hospital laboratory. Serum 25-Hydroxycholecalciferol levels were determined by using a chemiluminescence assay. Serum Calcium, Phosphorus and alkaline phosphate were measured using an end point assay in a multi-channel analyzer. Intact PTH was measured using a 2-site chemiluminescence immunoassay. Samples were analyzed in multiple assays.

Results: The data was collected from 100 patients of both genders. We compared the demographic variables of our sample in terms of age and gender. Although, there was no statistical difference between gender predisposition and Vitamin D deficiency, P-value was statistically significant for different age groups (p-value = 0.00). Among the biochemical markers which included Serum Calcium, Serum Phosphate, Serum Alkaline Phosphate and Serum Parathyroid Hormone, only Serum Phosphate showed statistically significant relationship (p-value = 0.000) with Vitamin D levels.

Conclusion: It is concluded that Vitamin D deficiency is very common in Pakistan there is no any protocol for proper supplementation. Vitamin D deficiency in Pakistan is becoming endemic and it is much predominant in elder and female population.

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INTRODUCTION:

Vitamin D deficiency is considered to be one of the most common medical conditions worldwide. The consequences of vitamin D deficiency include poor bone development and health and also increased risk of many common and serious diseases, including some common cancers, cardiovascular diseases, type 1 diabetes, and other autoimmune diseases [1]. It has been reported that 30-50% of both children and adults in the United States, Canada, Europe, Australia, New Zealand, and Asia are vitamin D-deficient. Despite the important role of sunlight in vitamin D synthesis, recent studies have shown that the rate of vitamin D deficiency is also higher in the sunniest areas of the world, including the Middle East countries, such as Saudi Arabia, Qatar, and United Arab Emirates, Turkey, India, and Iran because of low exposure to sun due to cultural factors [2].

Vitamin D2 and D3 can be taken from the diet and supplements. The sources of Vitamin D3 & D2 are different. The richest sources of vitamin D3 are egg yolk, butter, liver, fish oil and dietary supplements whereas plant sources like UV light grown mushrooms, fortified foods & dietary supplements contain vitamin D2 [3]. In practice, reliance is often on case finding, with a low threshold for considering vitamin D deficiency and osteomalacia in patients of Asian descent who present with musculoskeletal symptoms [4]. In addition, the 'routine biochemistry' sought by primary care practitioners includes serum adjusted calcium (Ca), phosphate (PO) and total alkaline phosphatase (ALP), often in conjunction with 25-hydroxyvitamin D (25-OHD). The last is particularly expensive [5].

Objectives of the study

The basic objective of the study is to analyze the biochemical profile and frequency of vitamin D deficient people.

METHODOLOGY OF THE STUDY:

This cross sectional study was conducted in Nishtar Hospital Multan during February 2018 to November 2018. The data was collected from 100 vitamin D deficient people who visited the OPD of the hospital regularly. One blood sample of 5ml was obtained from each patient. Blood tests were performed in the hospital laboratory. Serum 25-Hydroxycholecalciferol levels were determined by using a chemiluminescence assay. Serum Calcium, Phosphorus and alkaline phosphate were measured using an end point assay in a multi-channel analyzer. Intact PTH was measured using a 2-site chemiluminescence immunoassay. Samples were analyzed in multiple assays.

Statistical analysis:

The data was collected and analyzed using SPSS version 18.0. We used Pearson Chi-square test to compare the association of Vitamin D deficiency between infants and children and the demographic variables such as age and gender.

RESULTS:

The data was collected from 100 patients of both genders. We compared the demographic variables of our sample in terms of age and gender. Although, there was no statistical difference between gender predisposition and Vitamin D deficiency, P-value was statistically significant for different age groups (p-value = 0.00). Among the biochemical markers which included Serum Calcium, Serum Phosphate, Serum Alkaline Phosphate and Serum Parathyroid Hormone, only Serum Phosphate showed statistically significant relationship (p-value = 0.000) with Vitamin D levels.

Table 01: Analysis of deficiency of vitamin D

Vitamin D Deficiency										
		Normal			Moderate Deficiency		Severe Deficiency		P- Value	
		n	n	%	n	%	N	%		
Serum Calcium	Decreased Serum Calcium Levels	14	3	4.5	5	5.9	6	4.3	0.847	
	Normal Serum Calcium Levels	278	63	95.5	80	94.1	135	95.7		
Serum Phosphate	Decreased Serum Phosphate Levels	81	5	7.9	13	15.5	63	47.7	0.000	
	Normal Serum Phosphate Levels	135	37	58.7	50	59.5	48	36.4		
	Increased Serum Phosphate Levels	63	21	33.3	21	25	21	15.9		
Serum Alkaline Phosphate	Normal Alkaline Phosphate Levels	240	54	88.5	76	92.7	110	85.3	0.263	
	Increased Alkaline Phosphate Levels	32	7	11.5	6	7.3	19	14.7		

Serum Parathyroid Hormone	Decreased Serum Parathyroid Hormone Levels	8	1	2.6	4	6	3	3.2	0.064
	Normal Serum Parathyroid Hormone Levels	110	27	69.2	33	49.3	50	53.8	
	Increased Serum Parathyroid Hormone Levels	81	11	28.2	30	44.8	40	43	

DISCUSSION:

Vitamin D deficiency is the most common medical condition worldwide. An estimated one billion people in the world have vitamin D deficiency or insufficiency. The prevalence of vitamin D deficiency among adult population was reported to be 14-59% with a higher prevalence in Asian countries. Several studies in different parts of Iran and in different age-groups have shown the high prevalence of vitamin D deficiency [6]. In a similar study in Tehran among the general population, aged 20-64 years. Hashemipour *et al.* reported that the prevalence of severe, moderate and mild vitamin D deficiencies was 9.5%, 57.6%, and 14.2% respectively [7].

Despite the fact that direct comparisons of results of different studies are difficult due to the use of different methods for the measurement of 25-OHD concentrations and that different definitions for vitamin D deficiency have been used, the findings of our study indicate that the rate of severe vitamin D deficiency status has an increasing trend [8].

Despite the fact that most of the children included in our study had Severe Vitamin D Deficiency, majority had normal levels of Calcium but Serum phosphate was low in these children. Apart from this most of the children had normal levels of Serum Alkaline Phosphate but an increased serum parathyroid level [9]. Studies conducted in Europe correlate a negative relationship between **Serum Vitamin D** levels and Serum Parathyroid levels. These studies were conducted on Elderly population who showed secondary hyperparathyroidism along with Vitamin D deficiency. After proper Vitamin Supplementation of these individuals, PTH levels were shown to come back to normal. Our results could also be explained by the fact that low levels of Vitamin D could have caused an increase in PTH levels [10].

CONCLUSION:

It is concluded that Vitamin D deficiency is very common in Pakistan there is no any protocol for proper supplementation. Vitamin D deficiency in Pakistan is becoming endemic and it is much predominant in elder and female population.

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