

## Risk Factors Evaluation in Vitamin D Deficient Population

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### ABSTRACT

**Background:** Vitamin D concentrations often change with season, latitude, ethnicity, and diet composition. Proportion of the apparently healthy population may suffer from hypovitaminosis D. The purpose of this study is to investigate the prevalence and importance of vitamin D insufficiency, as well as the risk factors associated with it, in seemingly healthy persons.

**Materials and Methods:** This was a survey-type research that took place between December 2013 and February 2014. Following their agreement, 100 people completed a questionnaire requesting demographics and clinical features of hypovitaminosis D. The vitamin D levels of 50 people were evaluated in the Excel Labs and Islamabad Diagnostic Center, Islamabad, Pakistan.

**Results:** Data from 100 people was gathered. 25% are men and 75% are women. Questionnaires were used to obtain information on their demographics, height, and weight. The threshold values for Vitamin D were 20 ng/mL inadequate, 21-29 ng/mL insufficient, and >30 ng/mL sufficient. It was discovered in 80% of the females and 71% of the men tested. Only 8% of those lacking in Vit. D had symptoms, whereas 92% had none.

**Conclusion:** In conclusion, vitamin D insufficiency was widespread in our population. It is highly important to aware the health practitioners about the intervention techniques to rectify hypovitaminosis D.

**Keywords:** Vitamin D, prevalence, NIH

### INTRODUCTION

In the liver, vitamin D is metabolised to 25(OH) D, the primary circulating metabolite of vitamin D. To test vitamin D status clinically, serum 25(OH) D concentrations, which represent both vitamin D intake and endogenous synthesis, should be assessed. In the kidney, 1-hydroxylase converts 25(OH) D to its active form, 1, 25-dihydroxyvitamin D [1,25(OH)2D], which plays an important role in bone and muscle health by regulating calcium metabolism<sup>1</sup>.

25OHD deficiency and osteomalacia have also been observed in pregnant and nursing mothers, as well as outpatients from Pakistan<sup>2</sup>. In Karachi, Pakistan, maternal 25OHD insufficiency was found in 48% of nursing women and 52% of their babies<sup>3</sup>. Recently, clinics in Karachi and Lahore revealed ambulatory individuals with a frequency of 25OHD deficit of 92% and 81%, respectively<sup>4</sup>.

Pakistan is a sun-drenched country, and its citizens are supposed to obtain enough sunlight to avoid the hypovitaminosis D level. However, vitamin D deficiency is frequent among Pakistanis<sup>5</sup>. It was hypothesised that the observation of vitamin D insufficiency following immigration to the UK was due to an environmental influence, and that Pakistanis may not be getting enough sun exposure following relocation<sup>6</sup>. The goal of this study was to determine the prevalence, significance, and risk factors of vitamin D deficiency in otherwise healthy people.

### MATERIALS AND METHODS

This was a survey type study conducted during the months of December 2013 to February 2014. Following their agreement, 100 people completed a questionnaire requesting demographics and clinical features of vitamin D insufficiency. Laboratory reports of serum 25(OH) vitamin D of 50 individuals were collected from Excel Labs and Islamabad Diagnostic Center and were analyzed.

### RESULTS

The average Vitamin D level in 100 seemingly healthy people was 19.44 ng/mL which comprise of 25% males and 75% females (Table 1). Their age range was 16-80 years. Fig. 1 shows that 66% of people were above 30 years of age. Low 25OH vitamin D level (<20ng/mL) was found in 80% females and 71% males. Fig. 2 Shows that 92% of the people deficient in Vit. D showed no symptoms and only 8% were symptomatic.

Table 1: Distribution of Vitamin D deficiency among males and females.

Gender	Population %	Vitamin D deficient %
Males	25	71
Females	75	80
Total population %	100	

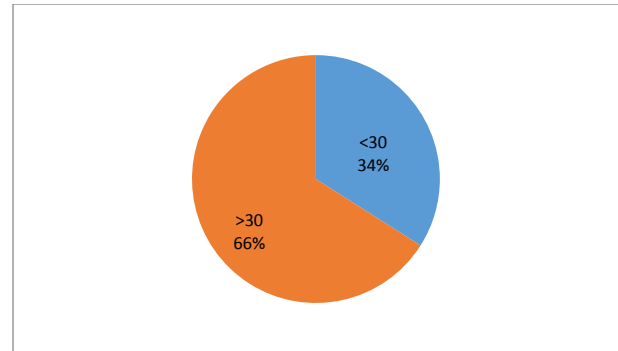


Fig. 1: Distribution among age groups (>30= above 30 years, <30= Below 30 years)

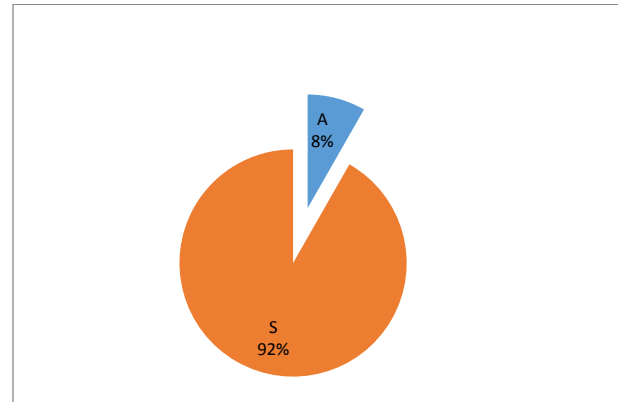


Fig. 2: Deficient people with symptoms and without symptoms (A= Asymptomatic, S = Symptomatic)

## DISCUSSION

Vitamin D is a hormone that regulates phosphorus, calcium, bone, and neuromuscular processes. Vitamin D production is a three-step process that involves the skin, liver, and kidney. The quantity of vitamin D consumed through diet and supplements completes the pool. The apparently healthy population has a significant frequency of vitamin D deficiency<sup>7</sup>. Despite the fact that sunlight is essential for vitamin D synthesis, studies undertaken over the last two decades have showed a significant prevalence of hypovitaminosis D in different countries including India, Turkey, China, Saudi Arabia, and Iran<sup>8</sup>.

According to numerous studies, the prevalence of hypovitaminosis D ranges different from region to region with 30-93%. Malabanan and colleagues<sup>9</sup> (1998) hypovitaminosis D have been reported in approximately 36% in age group 18-29 years, 42% of black female age group 15-49 years, 41% of outpatients age group 49-83 years, and up to 57% of general medicine patients in the US<sup>10</sup>. In Europe, such 25OHD levels are seen in 28%-100% of healthy persons and 70%-100% of all hospitalised adults<sup>11</sup>. According to Thomas et al. (1998), hospitalised both male and female patients of US had hypovitaminosis D. More unexpected is that ambulant post-menopausal women in sunny South Australia had hypovitaminosis D<sup>12</sup>. Also hypovitaminosis D reported in normal teenagers of Tasmania<sup>13</sup>.

It is reported that there is a global pandemic of hypovitaminosis D<sup>1</sup>. 25OHD deficiency and osteomalacia have also been observed in pregnant and nursing mothers, as well as outpatients from Pakistan<sup>2</sup>. In Karachi, Pakistan, maternal 25OHD insufficiency was found in 48% of nursing women and 52% of their babies<sup>3</sup>. Recently, clinics in Karachi and Lahore revealed ambulatory individuals with a frequency of 25OHD deficit of 92% and 81%, respectively<sup>4</sup>.

According to a rapidly developing research base, hypovitaminosis D is more common than in past reports. Affecting about 50% of healthy younger individuals. As per Third National Health and Nutrition Examination Survey (NHANES III), the prevalence of hypovitaminosis D in the US ranges from 25-57%<sup>14</sup>.

The following are some risk factors for vitamin D deficiency: Elderly, Skin that is darkly pigmented, Increased distance from the equator, Institutionalized or homebound The winter season, Wear protective clothes and/or sunscreen. Pollution of the air, Smoking, Obesity, malnutrition Renal and hepatic disease medicine including anticonvulsants, glucocorticoids, antirejection drugs, and HIV medications<sup>15</sup>.

## CONCLUSION

This study found a high level incidence of hypovitaminosis D (76.66%) in healthy resident adult of Rawalpindi and Islamabad, Pakistan. A larger sample study is required to explore the variables

that lead to a hypovitaminosis D. It is necessary to compare the rural and urban regions population. To avert complications of this avoidable condition, clinical efficacy of vitamin D supplementation and vitamin D dietary fortification initiatives would be extremely desired.

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