



Vitamin D Status among the Older Adults in India

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ABSTRACT

A particular micronutrient that is fat soluble is vitamin D. Despite year-round exposure to sunlight, vitamin D deficiency is widespread throughout the Indian Subcontinent. The most underappreciated and neglected micronutrient in the world is said to be vitamin D. Due to risk factors, elderly people are more likely to acquire a vitamin D deficiency. This study looked at how common vitamin D deficiency is in healthy persons in southern Rajasthan and how it relates to things like gender, eating habits, and environment (urban or rural residence). Between January and July 2015, we assessed seemingly healthy persons over 50 who visited the hospital for routine testing or to be a patient's companion. All of the individuals had their serum levels of 25 OH CHOLECALCIFEROL (D2+D3) assessed using COBAS e411 (Hitachi, Roche). Only 26% (53 out of 121 males and 83 females in the research) had normal levels (20-32 ng/ml), while 74% (151) had levels below 20 ng/ml. Women were more deficient (64%) than men (36%); vegetarians were more deficient (93%) than non-vegetarians (7%); and urban areas were more deficient (90%) (51/56) than rural areas (69%) Clinical and biochemical outcomes improved for all supplement recipients. Vitamin D insufficiency is highly common among females, strict vegetarians, and urban subjects even if there is plenty of sunshine; this is likely due to customary feminine overclothing, strict vegetarianism, and urban crowdedness. Vitamin D insufficiency is normalised by supplementation. Therefore, correct food fortification is indicated for older patients with disease and healthy appearances.

1 INTRODUCTION

Vitamin D is a fat-soluble, one-of-a-kind vitamin. Despite year-round exposure to sunlight, vitamin D deficiency is common in the Indian Subcontinent. Vitamin D is one of the most underappreciated and undertreated micronutrients on the planet. [1-3]

According to the International Osteoporosis Foundation, 96 percent of newborns, 91 percent of healthy schoolgirls, 78 percent of healthy hospital workers, and 84 percent of pregnant women in northern India have vitamin D insufficiency. [2]

Male and female deficiency rates in India's southern states were 40 percent and 70 percent, respectively. A significant discrepancy between the rural and urban populations was also seen, which was linked to differences in the two populations' occupations. [4]

Vitamin D is a micronutrient that has effects on skeletal and extraskeletal tissue. It is believed to be essential for optimal health, and its shortage has several health consequences as well as a significant financial burden

on the health-care system. We focused on the geriatric group, which has a higher risk of shortage due to several variables impacting Vitamin D availability in this cohort.

Our research focuses on the people of southern Rajasthan, where there is plenty of sunshine all year. Cultural differences, food preferences, and place of living were all taken into account. Adults with chronic vitamin D insufficiency have osteomalacia, osteoporosis, muscular weakness, and a higher risk of falling. [5-8] Vitamin D's skeletal advantages are extensively shown in epidemiological studies. [7,8]

The majority of the Indian population is impoverished and lives in rural areas with inadequate nutrition. Because many people lack access to vitamin D-rich foods and supplements, food fortification may help to lower the prevalence of vitamin D insufficiency in the general population.

Numerous research on vitamin D insufficiency have been conducted across the Indian subcontinent. We



focused our research on a healthy adult population. The goal of our research was to determine the incidence of vitamin D insufficiency in healthy individuals in southern Rajasthan, as well as the relationship between gender, dietary habits, and environment (urban or rural residence). The goal of the project is to raise awareness of vitamin D insufficiency in areas with plenty of sunshine, such as Rajasthan, with a focus on early detection and intervention.

The endocrine axis "Calcium-Vitamin D-Parathyroid hormone" includes vitamin D [9]. While vitamin D is necessary for calcium homeostasis, recent research has found that it also has a role in illnesses other than metabolic bone problems. The effects of 1,25-dihydroxyvitamin D [1,25(OH)₂D] are mediated via a particular, high-affinity vitamin D receptor found in a variety of organs. VDD or insufficiency affects an estimated one billion people worldwide [10]. Several changes in vitamin D metabolism take place during pregnancy. In normal pregnancy, the expression of 1- α hydroxylase increases in the kidney and placenta, and the quantity of blood 1,25-dihydroxy-vitamin D [1,25(OH)₂D] rises from the first to third trimester. The importance of 1,25-dihydroxyvitamin D in increasing intestinal calcium absorption during pregnancy has long been recognised [11]. Pregnant women with 25-hydroxyvitamin D (25(OH)D) values of less than 10 ng/ml (25 nmol/l) have been reported to have significant insufficiency everywhere over the world. Serum 25(OH)D concentrations of 10 ng/ml (25 nmol/l) were found in around 18 percent of pregnant women in the UK, 42 percent in northern India, 61 percent in New Zealand, 89.5 percent in Japan, and 60–84 percent of pregnant non-Western women in The Hague, Netherlands [12–16].

Surprisingly, concerns have been expressed that VDD is common in tropical nations like India, where the bulk of the population lives in locations that receive enough of sunshine all year. According to many research published before [9] there is widespread prevalence of variable degrees (50–90 percent) of VDD in the Indian population with poor dietary calcium consumption. Because of the active transplacental transfer of calcium to the developing baby, the issue is expected to exacerbate during pregnancy in a population with a high prevalence of VDD and low dietary calcium intake. More urbanisation leads to less outdoor exercise and increased pollution, which, when

combined with skin pigment, may exacerbate the condition. In addition, milk, which is the major source of calcium, is a costly meal in India.

According to a recent study from the north-eastern section of India, VDD was discovered in 41% of the patients [17]. Previous research has found varied levels of VDD in various locations of India [17–20]. According to a recent study, VDD during pregnancy is linked to a variety of negative health consequences in mothers [21].

In India, there are few data on the prevalence of vitamin D during pregnancy. There are currently just a few research papers that show a risk factor for VDD in Indian pregnant women. As a result, the current study was done with the goal of determining the incidence of VDD in the pregnant population of north India and identifying risk factors for VDD.

2. METHODS

The purpose of this research was to determine the frequency of vitamin D insufficiency in healthy individuals in southern Rajasthan, as well as the relationship between gender, dietary habits, and environment (urban or rural residence). Between January 2015 and July 2016, we looked at apparently healthy persons over the age of 50 who came to the hospital for regular evaluation or as a companion to a patient.

A detailed history and physical examination were performed according to a predetermined protocol, and the results were documented. All individuals had their serum 1, 25-dihydroxycholecalciferol (D₂+D₃) levels and serum creatinine levels measured. Cobase 411 was used to calculate vitamin D levels (Hitachi, Roche). Values less than 20 ng/mL were judged insufficient in our study, whereas levels greater than 20 were regarded appropriate. The study excluded those who had a history of vitamin D insufficiency or supplementation. Patients with known renal illness (GFR less than 60), liver disease, or parathyroid issue, as well as a history of antiepileptic drug use, were excluded from the research.

3. RESULTS

We gathered data from 121 males and 83 females between the ages of 50 and 82 in our study. Only 26% (53) of the participants had normal levels (20–32ng/ml), whereas 74% had overall insufficiency levels (151). Females were found to have a higher rate of deficit



(64%) than men (36%). Vegetarians (93%, 140) had higher levels of deficiency than non-vegetarians (7%, 11). The urban population (90%, 51/56) was more affected than the rural population (69%, 100/148).

Those that took supplements saw a 100 percent improvement. (No hazardous level greater than 160ng/ml has been found.)

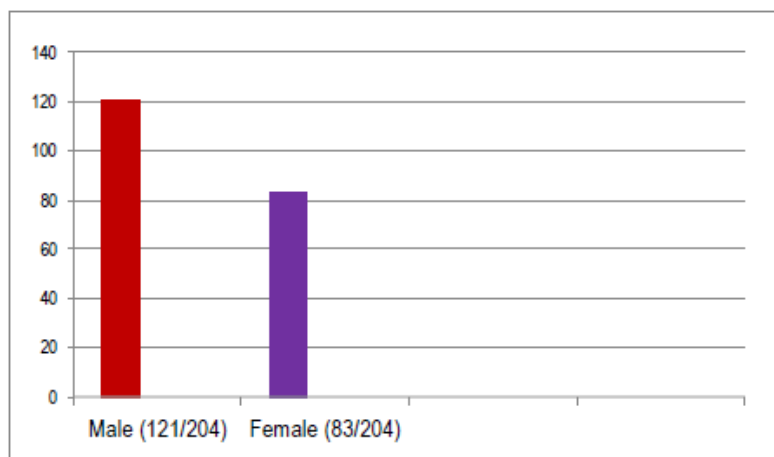


Figure 1: Sample of Cases Taken for Study

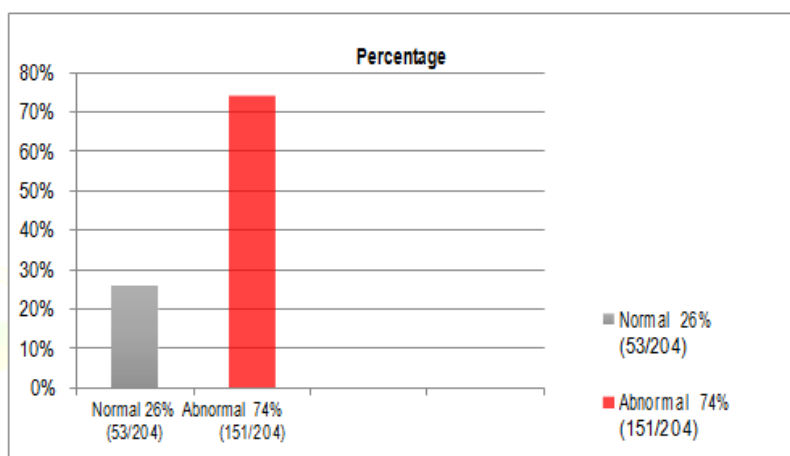


Figure 2: Percentage of Normal Levels among 204 samples taken

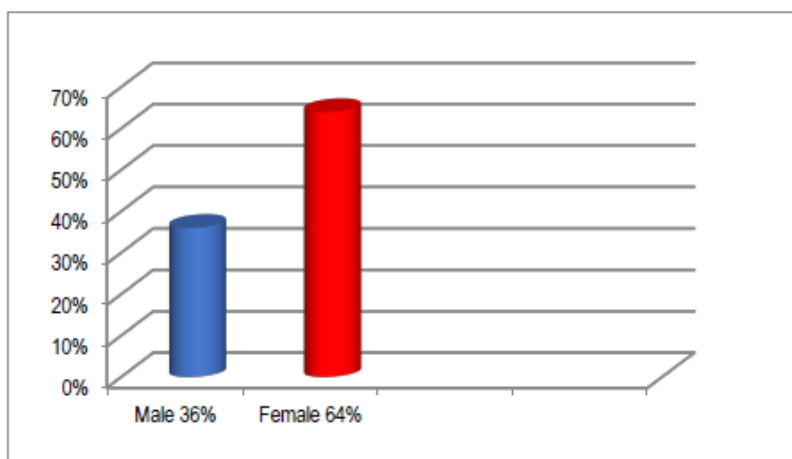


Figure 3: VDD Levels in Male and Female

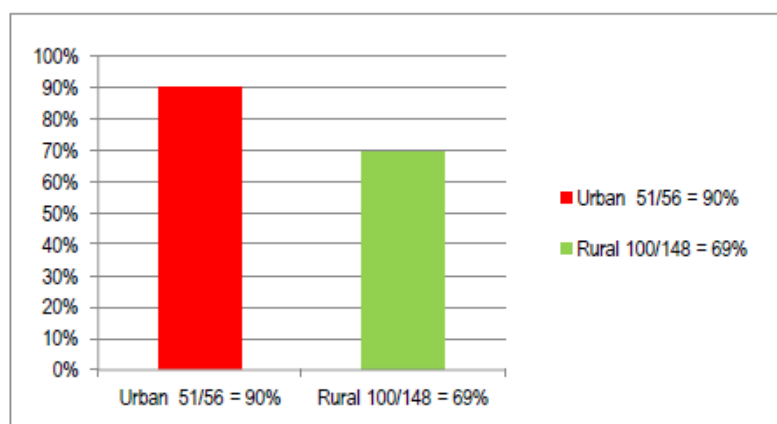


Figure 4: Percentage of Rural and Urban Deficiency

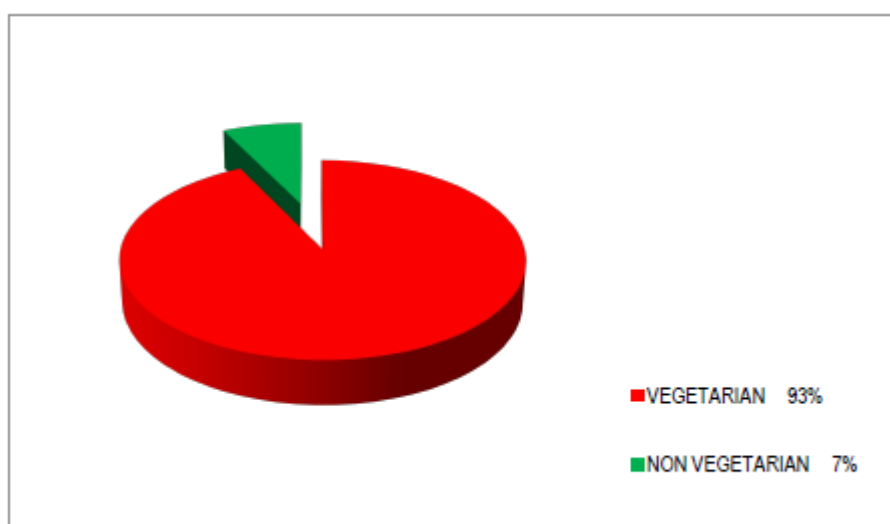


Figure 5: VDD and Dietary Co-Relation

4. DISCUSSION

Vitamin D's function has evolved from that of a fat-soluble vitamin to that of a hormone or metabolic regulator. With a greater knowledge of its function in sustaining optimal health in general and bone health in particular, it has been expanded to include a role in lowering the risk of cancer, multiple sclerosis, and type 1 diabetes mellitus. With numerous functions, its relevance in avoiding chronic illnesses and sustaining health is critical throughout life cycles. [22] Despite significant sun exposure in most regions of India, particularly in the north, vitamin D insufficiency is common. Without a doubt, enough sun exposure is an unsustainable long-term strategy for achieving vitamin D adequacy. A lack of calcium in the diet combined with a shortage in Vitamin D exacerbates the problem, which is exacerbated by a delayed presentation to a health care practitioner. The elderly in North Indian

states, and the Indian population in general, are more frequently ignored than their counterparts, and the need to enhance their vitamin status is both crucial and urgent.

According to the International Osteoporosis Foundation, 96 percent of newborns, 91 percent of healthy schoolgirls, 78 percent of healthy hospital workers, and 84 percent of pregnant women in northern India have vitamin D insufficiency. [2] Male and female deficiency rates in India's southern states were 40 percent and 70 percent, respectively. A significant discrepancy between the rural and urban populations was also seen, which was linked to differences in the two populations' occupations. [4] In the current study, 74 percent of the 204 individuals showed vitamin D deficient insufficiency, which is slightly lower than previous studies. Regular supplementation resulted in biochemical and clinical improvements.



Better and more affordable facilities should be made accessible throughout India, particularly in rural areas, to enable rapid detection of clinical symptoms of vitamin D insufficiency in persons who require medical treatment. The importance of population-based initiatives at the national level cannot be overstated; these programmes should focus on raising awareness about vitamin D insufficiency, providing inexpensive vitamin D supplements, and providing vitamin D fortified foods to the Indian community as a whole. Continued study in this area is required to provide a complete picture of the ongoing vitamin D issue, as well as to track changes through time.

5. CONCLUSION

Despite abundant sunlight, vitamin D insufficiency is especially common among females, vegetarians, and urban dwellers. Vitamin D insufficiency may be caused by urbanisation, a strict vegetarian diet, and traditional feminine dress. Vitamin D insufficiency can be corrected with supplementation. In both healthy and ill older people, adequate dietary fortification (DALDA) and Vitamin D supplementation is recommended. Salmon, tuna fish, fish liver oil, and fatty fish meat are all good sources of Vitamin D. Other dietary sources of Vitamin D, such as beef liver, cheese, egg yolks, and cow's milk, are rather weak. Sun exposure between 10 a.m. and 2 p.m. that provides UBB for 30 minutes on the skin of the arms and face is required for optimal vitamin D synthesis, according to a 2004 WHO/API2011 recommendation.

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