

Vitamin D Status Among the Elderly Persons of South Rajasthan – A Prospective Observational Study

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ABSTRACT

Background: Vitamin D a fat soluble unique micronutrient. Deficiency of vitamin D is widely prevalent in Indian Subcontinent despite wide exposure to sunlight round the year. Vitamin D is considered to be most under evaluated and under treated micronutrient round the world. Elderly persons are more prone to develop Vitamin D deficiency because of risk factors. **Methods:** This study was done to study the prevalence of vitamin D deficiency in healthy adults for southern Rajasthan and its correlation with gender, dietary habits and habitat (urban or rural residence). We evaluated apparently healthy adults of age more than 50 years presenting to hospital for routine evaluation or as accompanying person with patient between January to July 2015. The serum -25 OH CHOLECALCIFEROL (D2+D3) levels were estimated in all the subjects by COBAS e411 (Hitachi, Roche). **Results:** The study (Males 121, Females 83), aged 50 – 82 years shows normal level (20-32 nag/ml) in only 26% (53), while 74% (151) had <20ng/ml. Women were more deficient (64%) than males (36%); vegetarians more [93% (140)] than non-vegetarians [7% (11)]; urban more 90% (51/56) than rural 69% (100/148). All those who received supplementation improved clinically and bio chemically. **Conclusions:** Despite abundant sunshine Vitamin D deficiency prevalence is very high among females, vegetarians and urban subjects, for which presumably conventional female over clothing, strict vegetarianism and urban crowdedness are responsible. Supplementation normalizes Vitamin D deficiency. Therefore, proper food fortification in healthy looking and diseased elderly persons is advised.

Key words: Vitamin D deficiency, 25-hydroxy vitamin D, life style disorders.

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INTRODUCTION

Vitamin D a fat soluble unique micronutrient. Deficiency of vitamin D is widely prevalent in Indian Subcontinent despite wide exposure to sunlight round the year. Vitamin D is most under evaluated and under treated micronutrient round the world.^[1-3]

Around 96% of neonates, 91% of healthy school girls, 78% of healthy hospital staff, and 84% of pregnant women from northern India were found to have deficiency of vitamin D

as per report of International Osteoporosis foundation.^[2] Southern states of India reported deficiency rates of 40% and 70 % among males and females respectively. Significant difference between rural and urban population was also noted, usually attributed to difference in occupation of respective population.^[4]

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Vitamin D is a micronutrient which has effects on skeletal and extra skeletal tissue, considered to vital for good health its deficiency leads to multiple ramifications for health and enormous burden on health care system. We have focus on geriatric population which has even more likelihood for deficiency due to multiple factors affecting the availability of Vitamin D in such population. Our study is focusing on population of southern Rajasthan which as ample availability of sun light round the year. Difference in cultural practice, dietary preference and residence were taken in account. Chronic vitamin D deficiency in adults results in osteomalacia, osteoporosis, muscle weakness and increased risk of falls.^[5-8] Epidemiological support for skeletal benefits of vitamin D is well known.^[7,8]

Majority of Indian population is underprivileged and living in rural area having poor nutritional status. As foods and supplements rich in vitamin D are not available to majority, fortification of foods may reduce the incidence of vitamin D deficiency in general population. There are multiple studies on vitamin D deficiency available from all across Indian subcontinent. In our study, we have targeted adult healthy population. Aim of our study was to study the prevalence of vitamin D deficiency in healthy adults for southern Rajasthan and its correlation with gender, dietary habits and habitat (urban or rural residence). The study aims to impress about vitamin D deficiency in area with ample sunlight such as Rajasthan, with emphasis on early diagnosis and intervention.

METHODS

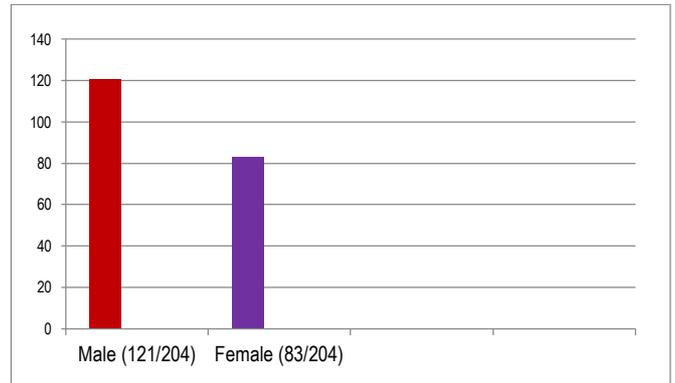
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Detailed history and physical examination was done as per set proforma and finding were recorded. Serum 1, 25 – dihydroxy cholecalciferol (D2+D3) levels and serum creatinine were estimated in all subjects. Vitamin D estimation was done using Cobase411 (Hitachi, Roche). In our study levels less than 20 ng/mL were considered deficient and levels more than 20 were considered adequate. Subject with known history of vitamin D deficiency or supplements were excluded from study. Patients with any known renal disease (GFR less than 60), liver disease or parathyroid disorder, history of intake of antiepileptic medications were also excluded from the study.

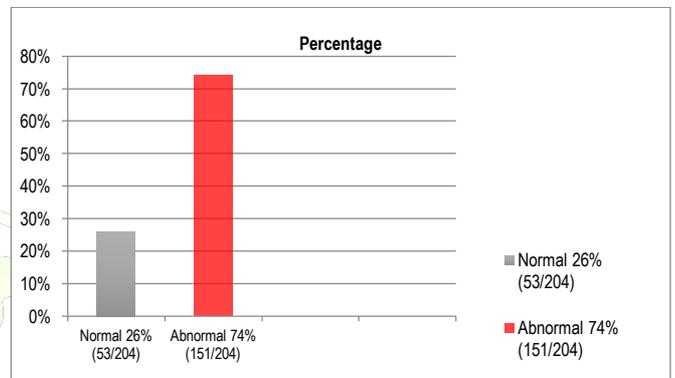
RESULTS

In our study, we collected data for 121 males and 83 females of age group 50 to 82 years. Normal levels (20-32ng/ml) were showed only by 26% (53) while overall deficiency level was present in 74% (151). The deficiency was found to be more in females (64%) than in males (36%). Deficiency was found to be more in Vegetarians (93%, 140) than non-

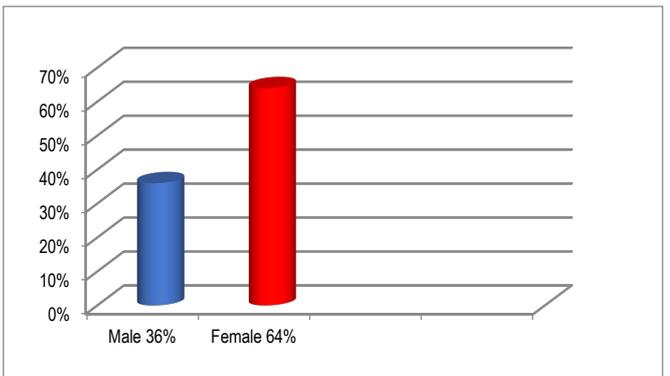
vegetarians (7%, 11). Urbans (90%, 51/56) were more affected than rurals (69%, 100/148). Those who received supplements improved 100 %. (None has shown toxic level more than 160ng/ml).



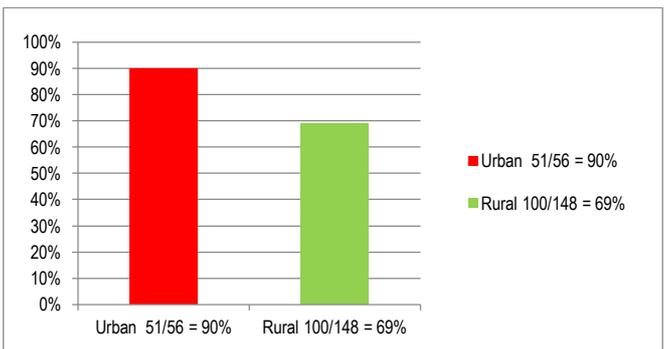
Graph 1: Sample of Cases Taken for Study



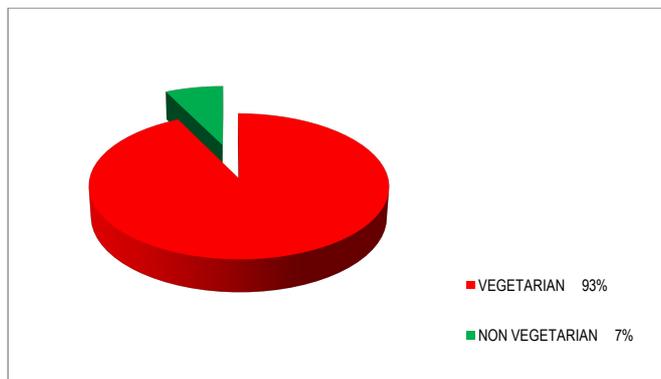
Graph 2: Percentage of Normal Levels among 204 samples taken



Graph3: VDD Levels in Male and Female



Graph 4: Percentage of Rural and Urban Deficiency



Graph 5: VDD and Dietary Co-Relation

DISCUSSION

Role of vitamin D has changed from just a fat-soluble vitamin to hormone or a metabolic modulator. With better understanding about its role multiple facets of its action in maintaining optimal health in general and bone health have extended to role in risk of reducing the risk of cancer, multiple sclerosis and type 1 diabetes mellitus. With multiple roles, its importance throughout life cycles in preventing chronic diseases and maintaining health is of paramount importance.^[9] Vitamin D deficiency in India is widespread despite widespread sun exposure in most parts of India more so in Northern parts of India. Good exposure to sunlight is without any doubt a long term untenable solution for attaining vitamin D sufficiency. Poor dietary intake of calcium with concomitant deficiency of Vitamin D makes matters worse compounded with delayed presentation to health care provider. Older population of North Indian states and Indian population in general is neglected more often is neglected more than the other counterparts and need for improvement in vitamin status of this age group is both important and urgent.

Around 96% of neonates, 91% of healthy school girls, 78% of healthy hospital staff, and 84% of pregnant women from northern India were found to have deficiency of vitamin D as per report of International Osteoporosis foundation.^[2] Southern states of India reported deficiency rates of 40% and 70 % among males and females respectively. Significant difference between rural and urban population was also noted, usually attributed to difference in occupation of respective population.^[4]

In the present study, among 204 subjects, 74% had vitamin D deficiency insufficiency, which is slightly lower than the studies in past. Regular supplementation resulted in improvement both bio-chemically and clinically.

Better and cheap facilities should be made available in all parts of India especially in Rural parts of India to enable timely diagnosis of clinical manifestations of vitamin D deficiency in individuals who need attention by the clinicians.

Need for population-based programs at the national level cannot be under emphasized, such programs should focus on increased awareness about Vitamin D deficiency and provide affordable vitamin D supplements and also to provide vitamin D fortified foods to the Indian populace at large. Continued research in this field is needed for comprehensive picture of the ongoing vitamin D problem with monitoring of changes over time.

CONCLUSION

Vitamin D deficiency prevalence is very high among females, vegetarians, urbans despite abundance sunlight. Urbanization, strict vegetarian diet and conventional female clothing may be responsible for Vitamin D deficiency. Supplementation normalizes Vitamin D deficiency. So, proper food fortification (DALDA) and Vitamin D supplementation in healthy looking and diseased elderly persons is advised. Good dietary sources of Vitamin D include salmon, tuna fish, fish liver oil and flesh of fatty fish. Other sources such as beef liver, cheese, egg yolks, cow's milk are relatively poor dietary sources of Vitamin D. 2004 WHO/API2011 given a guideline that sun expose between 10AM to 2PM which provide UBB for 30 minute on skin of arms and face is require for adequate synthesis of vitamin D.

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