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Research Paper

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TO COMPARE VITAMIN D DEFICIENCY PREVALENCE BETWEEN HEALTHY YOUNG INDIVIDUALS IN URBAN AND ADJOINING RURAL AREAS OF JAIPUR.

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Introduction:

Our country India is vastly populated tropical country with majority of the population living in areas which receive adequate sunlight. The state of Rajasthan especially receives more than ample amounts of sunlight, leading to the misbelief that vitamin D deficiency can not be found among the people residing in this state. However, according to the published literature, Vitamin D deficiency is quite common in India in all ages and sexes (1). Vitamin D deficiency is prevalent all over the world. Studies have reported approximately 1 billion people to be vitamin D deficient worldwide. (2)

Vitamin D synthesis depends on many factors like the length of time and time of exposure to sun, air quality index and skin pigmentation and colour. Vitamin D is fat soluble, synthesized from 7-dehydrocholesterol in subcutaneous fat. This vitamin is crucial for calcium metabolism and homeostasis. Thirty minutes of sun exposure between 10 to 2 pm is adequate for its formation. Adequate Vitamin D and Calcium during adolescence can help to decrease the risk of osteoporosis in later years of life. There is adequate sunshine in Rajasthan, but high temperature does not allow enough exposure to the sunlight. Most young adults of 20-40 years living in urban areas spend most of their daytimes indoor working. Moreover, the present lifestyle does not incorporate sports and other outdoor activities in routine lives. Rural population on the other hand has much more outdoor sunlight exposure. Hence deficiency of Vitamin D can be expected more in young individuals who reside in urban areas as compared to those individuals who reside in rural areas.

Inadequate Vitamin D level can play an important role not only in osteoporosis but also in increasing risk of diseases like cancer especially of breast and colon, cardiovascular diseases, diabetes, arthritis, tuberculosis etc (1-4). Communicable and noncommunicable diseases are nearly all associated with Vitamin D deficiency in adults residing in South Asia (5,6). It is of utmost importance to estimate the prevalence of Vitamin D deficiency so that steps like food fortification can be undertaken from early adulthood to prevent it.

Aims & Objectives

Our study aimed to “Compare the prevalence of vitamin D deficiency among healthy young adults of 20-40 years in urban and adjoining rural areas of Jaipur.”

Objectives-

1. Determine vitamin D deficiency prevalence among healthy young individual in urban population of Jaipur.
2. Determine vitamin D deficiency prevalence among healthy young individual in rural population adjoining Jaipur.
3. To identify the factors associated with Vitamin D deficiency.

Material and Method:

Study design: Investigative study.

Sample size: 300 healthy young individuals in age group 20-40 years living in urban and adjoining rural areas of Jaipur. 150 volunteer subjects were taken in each group.

Study place: MGUMST Sitapura, Jaipur

Naveen Fracture and General Hospital, Vaishali, Jaipur.

Study was carried out from February 2023 to July 2023 involving 150 healthy young individuals in age of 20-40 years living in urban area and 150 adults living in rural area adjoining Jaipur. In urban group, 88 were male and 62 were female, in rural 58 were male and 92 were female. Vitamin D test is a blood test, Serum 25(OH) levels was estimated. Blood sample was collected from a vein under proper aseptic conditions. Institutional Ethical committee letter no/MGMCH/IEC/JPR/2022/1122 gave ethical approval for our project.

Vitamin D deficiency is present when Serum 25(OH) levels are <20ng/ml; insufficient vitamin D is between 20-30ng/ml and sufficient vitamin D when it is >30ng/ml. This is according to the clinical practice guidelines of endocrine society (7).

All the participants were given full knowledge about the purpose and procedure of the study and consent taken. A google form questionnaire was filled by the subjects regarding their sunlight exposure, clothing, diet and any supplements taken by them. Data was analysed using SPSS version 25 software.

Inclusion Criteria: All healthy young volunteer adults in age group of 20-40 years living in urban areas of Jaipur and adjoining rural areas of Jaipur.

Exclusion Criteria: Individuals suffering from any known medical illness like Diabetes, Hypertension, Cancer, Sleep disorders, Depression, skin ailments and those on medication for these disorders or taking any type of supplements.

Novelty of proposed research project:

Rajasthan state is a place with abundant sunshine because of its geographical position. It is assumed that adequate sunlight exposure will prevent vit D deficiency among young individuals residing in Jaipur city. There has not been much research done in our city related to vitamin D deficiency especially among young individuals. By doing this research project we can understand the vitamin D deficiency prevalence and the factors leading to vit D deficiency among the rural and urban populations. We can compare the lifestyle and then advice the young adults about dietary and lifestyle changes which can prevent the complications associated with this deficiency in their later age.

Result, Discussion and relevance of proposed research project to public health:

A thorough literature search in the electronic data of PubMed, Scopus and CINAHL was done. The seed article considered for this study was “High prevalence of vitamin D deficiency among the South Asian adults: a systematic review and meta-analysis” is mentioned in the references (8).

The result of our study showed that Vitamin D deficiency is more prevalent in young adults residing in urban areas. 47% of urban residents has vit D deficiency while only 18% of rural young adults had vit D deficiency. Adults residing in rural areas reported up to 3 hours of sunlight exposure, urban residents reported only 1 hour of sunlight exposure and that too occasionally. Regarding dietary intake, rural residents had more dairy products intake and fresh and seasonal vegetables with minimum fast-food intake. Urban residents’ diet was at erratic hours, less fruits and vegetables, less dairy products intake and more fast-food intake (at least twice a week). Subjects taking any kind of Supplements were not considered in this study. People residing in rural areas wore airy cotton-based fabric clothes allowing better sun exposure. On the other hand, Urban young adults staying indoors in air conditioned places wore more covered clothing in various fabrics.

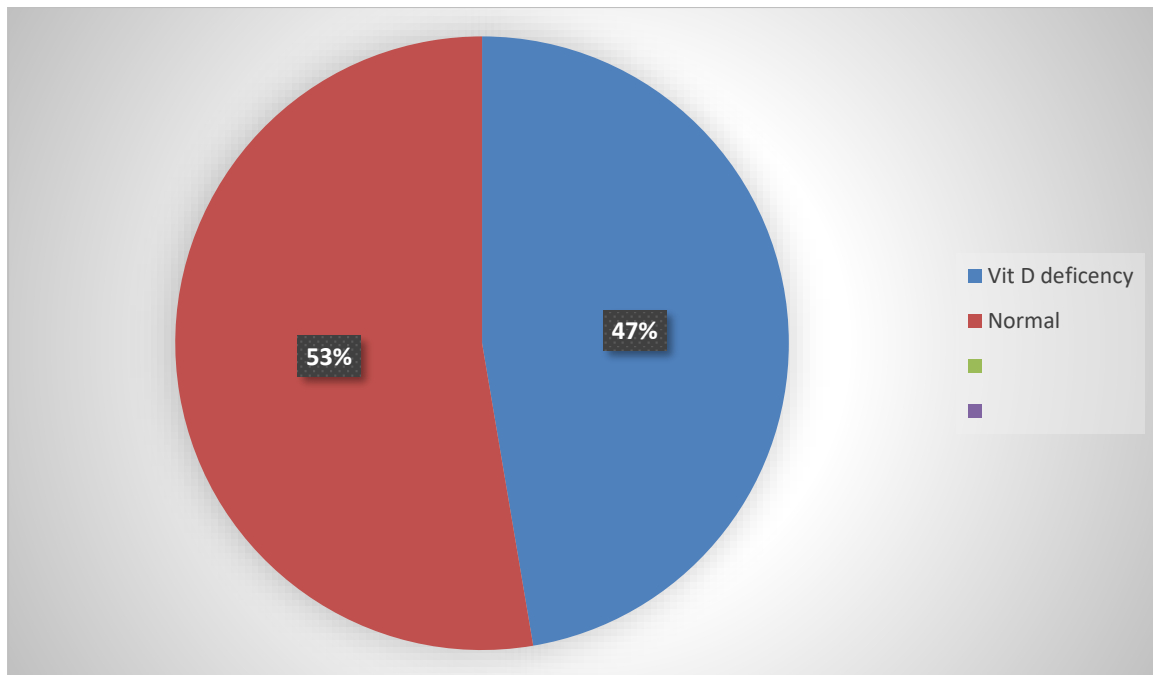


Fig. 1. Vitamin D Deficiency in Urban Population

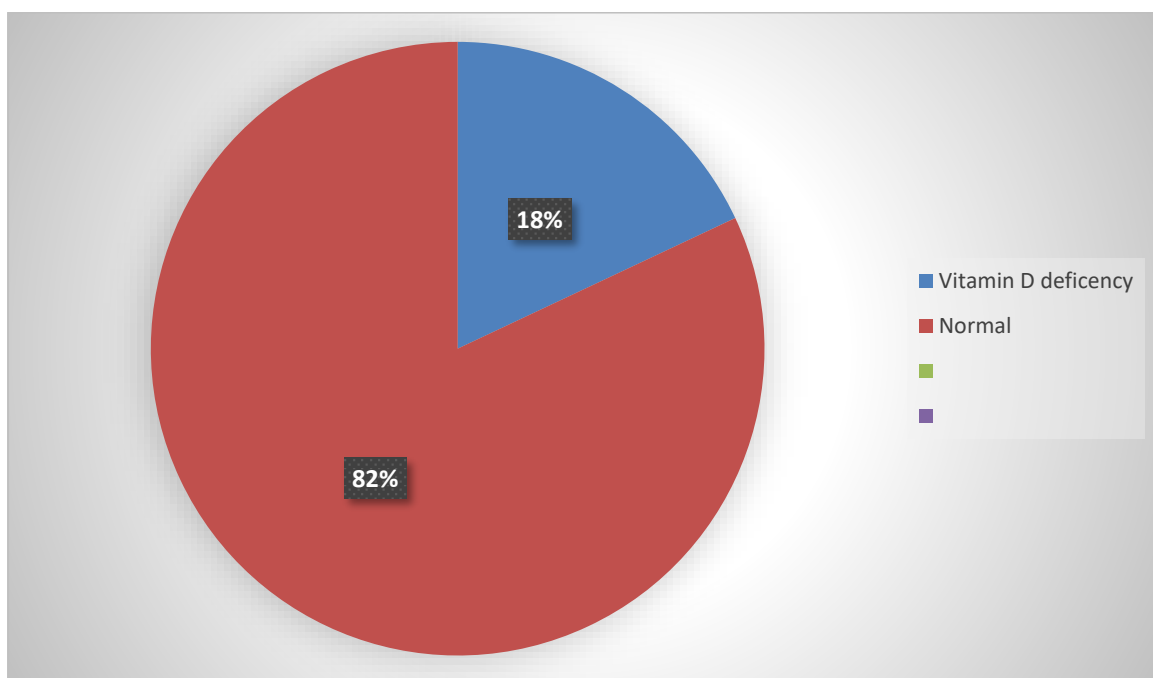


Fig.2. Vitamin D Deficiency in Rural Population

The conclusion of our study was similar to Study conducted by Beth A Bailey et al “The Impact of living in rural and urban areas: vitamin D deficiency and medical costs in veterans” The journal of rural health, volume 28, issue 4, April 2012(9)

Marwaha et al reported vitamin D deficiency in healthy Indians of more than 50 years age from North India in JAPI. However, there is no correlation of bone mineral density in this study (10)

Another study conducted by C V Harinarayan et al studied vitamin D and bone mineral density in women in the reproductive age women in South India. They reported Vitamin D deficiency

in 76% in reproductive age group, 70% in postmenopausal and 16% insufficiency in reproductive age group (11)

Goswami and others reported that Vitamin D level can come to normal after 8 weeks of giving supplement with weekly dose of 60000 IU (12)

Less knowledge about vitamin D and negative perspectives of people towards sunlight exposure has been reported among students of India and Pakistan (13,14)

A recent study concluded that vitamin D is also associated with cytokine storm which causes increased vulnerability among COVID 19 patients during the pandemic (14)

Conclusion

The increased Vitamin D deficiency among young individuals is a health challenge and must be taken seriously. There should be national level guidelines and policies addressing nutrition which can prevent Vitamin D deficiency. People who prefer more covered clothing and spend maximum time indoors must be encouraged to get their serum level of Vitamin D checked on a three-monthly basis and take adequate supplements. Lifestyle and dietary changes can be advised to both rural and urban area residents which can help prevent vitamin D deficiency. Mass campaigns can be introduced explaining the inter-relation between overhead sun exposure and Vitamin D, such campaigns can prove to be quite effective. Also measures like increased availability of test centres for Vitamin D deficiency and lowering the cost of tests by government would definitely help in dealing with this new age pandemic.

Study limitations include the observational design and inclusion of only young adults (20-40 years) of Jaipur. However, thorough study of all research done on Vitamin D deficiency was analysed and considered before forming the conclusion of this study.

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