

“An analytical study of the Impact of sunscreen on the biosynthesis of vitamin D in urban females”

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Abstract

The usage of sunscreen has grown during the last several decades. The fact that more people are aware of sunscreen's ability to protect against illness, wrinkles, dark spots, and skin tanning is one of the main reasons for this rise in use. In the lowest epidermal layer of the skin, exposure to sunshine is the main catalyst for the transformation of ace vitamin D (7-hydrocholesterol-derived vitamin D) into pre vitamin D. sadly; there aren't many sources of vitamin D in food. The most expensive sources are fish liver oil and fatty fish like salmon, mackerel, and trout, whereas egg yolks, cheddar, and hamburger liver have lower concentrations. This study's goal was to ascertain what sunscreen meant for vitamin D synthesis in females who had just been diagnosed with hypovitaminosis D at various sites. In order to learn more about the 213 people who had just been diagnosed with hypovitaminosis D, a survey was sent to them. Out of 213 respondents, 159 (74.64%) used sunscreen regularly and had blood vitamin levels between 3.69 and 11.48 ng/ml. Only 54 (25.35%) individuals who had blood vitamin levels between 9.27 and 18.93 ng/ml and

only sometimes used sunscreen. Most people contend that using sunscreen with an SPF of 15 or higher may prevent the formation of vitamin D by inhibiting UVB radiation. Additional investigation with a larger example size would be crucial for better understanding.

Keyword: - Sunscreen, Vitamin D, Diagnosis, Interpretation, Production.

Introduction

Clinicians have been concerned about the prevalence of hypovitaminosis D for a few years since it is thought to be a condition that disproportionately affects urban and rural populations and remains untreated. The body's ability to retain calcium and phosphorus is thought to be aided by vitamin D, a fat-solvent vitamin, according to long-held theories. The fact that vitamin D behaves like a chemical and is present in the majority of organs and tissues indicates that it is capable of more than only maintaining bone health. Numerous studies suggest that vitamin D may inhibit the formation of cancerous growth cells, promote resistance, assist in the delivery of contaminants, and lessen agitation. The skin's generation of vitamin D serves as the main source of its combination, except from food sources and supplemental ones. More than 1 billion people throughout the globe have low blood levels of this very helpful vitamin. According to certain research results, hypovitaminosis D may have a substantial role in the spread of a broad range of diseases. We have heard from a number of places that we should protect our skin from excessive sun exposure since it may result in skin cancer and a few other skin problems. Sunscreen use generally has significantly increased, especially among younger generations that like spending time outside. Only a few of the common chemical sunscreen active ingredients include oxybenzone, avobenzene, homosalate, octocrylene, octinoxate, and octisalate. The main ingredients in mineral sunscreen are titanium oxide and zinc oxide. 93% of UVB rays are protected by SPF 15 sunscreen, 96% by SPF 30 sunscreen, and 98% by SPF 50 sunscreen. Sayed Aliul Hasan abdi and partners, in an article named "The strength of the sunscreen fixing octocrylene to upset vitamin D bonds," tracked down that one of the sunscreen fixings, octocrylene, has been displayed to tie to nutrient receptors, vitamin D-restricting proteins, and vitamin D. revealed that it is related with a limiting protein. The interaction of the compounds CYP2R1 suggests an increased risk of

vitamin D abnormalities. According to the study "Effect of Sunscreen on Vitamin D" Survey", Neale R.E. Khan SR et al. Lois Y., Matsuoka, M.D., et al. This means that when applied all over the body, it completely reduces the response of vitamin D to UVB. In the study "Sunscreen photograph assurance and vitamin D status," conducted by T. Passerson, R. Bouillom, et al., it was discovered that applying sunscreen for both daily and athletic photo insurance did not stop the body from producing vitamin D.

Method and Materials

We selected female members from various medical professionals' offices and scientific laboratories who often left their homes for work or school outdoors without wearing a niqab, a scarf, or both. We only took into account those who had just gotten a diagnosis and had not yet begun receiving vitamin D supplements in any form (case, pill, or infusion). The participants were asked to complete a survey in order to get information about how often or seldom they use sunscreen every day. Out of the total 294 members that were contacted, 81 were disqualified because they did not adhere to the consideration guidelines. A total of 213 patients could be reached to learn how sunscreen affects vitamin D production.

Result

The goal of the research was to determine how sunscreen impacted those who had just been diagnosed with hypovitaminosis D's ability to produce vitamin D. The patients who regularly covered exposed body parts with sunscreen with SPF 15 and SPF 30 to protect themselves from the skin-damaging effects of sunlight would likely be taken into consideration. Only 54 (25.35%) of the 213 respondents with vitamin levels between 9.27 and 18.93 ng/ml were found to sometimes use sunscreen, compared to 159 (74.64%) of those with serum vitamin levels between 3.69 and 11.48 ng/ml. The majority of regular sunscreen users also suffer from severe hypovitaminosis D (serum vitamin D levels were displayed to go from 3.69 to 11.48 ng/ml, which is low contrasted with incidental clients). From total, 62 reported cases were in the 15–19 age group, 109 in the 20–25 age group, and just 42 in the 25–30 age group. Serum 25(OH)D levels in regular sunscreen users were on average 5.62ng/ml, while levels in infrequent sunscreen users were 14.48ng/ml. The

difference in 25(OH)D characteristics may be a sign that sun protection usage and blood vitamin D levels are somehow connected. The combined results indicated that using sunscreen could decrease vitamin D production since the mean serum vitamin D level was 9.87ng/ml.

Table 1: lists the mean vitamin D level and the proportion of persons in each age group who frequently apply sunscreen.

Outdoor duration in minute	Age 15 – 20 yrs	Age 20–25 yrs	Age 25-30 yrs	Mean Value of 25(OH)D In serum.
10-15	15	19	05	3.01ng/ml
15-20	11	20	08	5.99ng/ml
20-25	13	23	10	9.88ng/ml
25-30	10	19	06	3.61ng/ml
Total	49	81	29	5.62ng/ml average value

Table 2: a graph showing the average vitamin D level for each age group as well as how often they wear sunscreen.

Outdoor duration in minute	Age 15 – 20 yrs	Age 20–25 yrs	Age 25-30 yrs	Mean Value of 25(OH)D In serum.
10-15	02	11	03	8.98ng/ml
15-20	04	08	02	15.41ng/ml
20-25	06	07	05	14.45ng/ml
25-30	01	02	03	19.11ng/ml
Total	13	28	13	14.48ng/ml average value

Table 3: We collected information on the overall population across all age categories and their average vitamin D levels.

Outdoor duration	Age 15 – 20 yrs	Age 20–25 yrs	Age 25-30 yrs	Mean Value of 25(OH)D
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in minute				In serum.
10-15	15+02=17	19+11=30	05+03=08	11.99ng/ml
15-20	11+04=15	20+08=28	08+02=10	5.99ng/ml
20-25	13+06=19	23+07=30	10+05=15	10.16ng/ml
25-30	10+01=11	19+02=21	06+03=09	11.36ng/ml
Total	62	109	42	9.87ng/ml average value

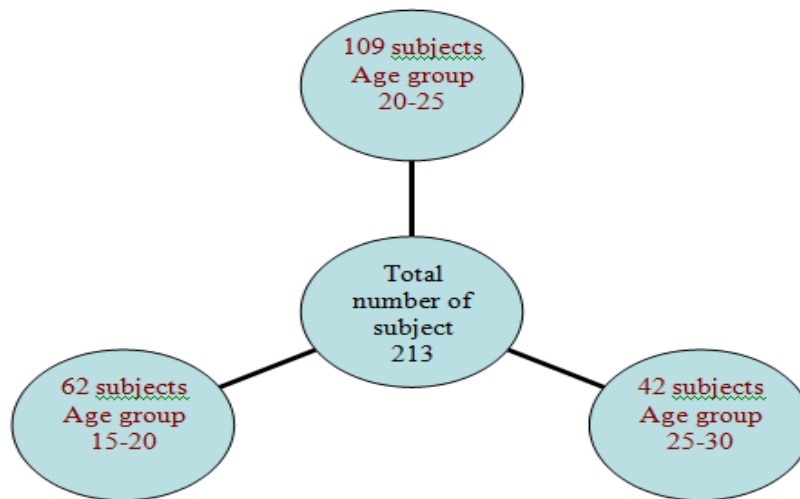


Fig. 1: A pie chart detailing the overall number of people involved and their breakdown by age bracket is shown.

Discussion

Synthetic sunscreens with SPF 15 and SPF 30 and synthetic chemicals such as avobenzone, homosalate, octocrylene, octinoxate, octisalate, and oxybenzone can have adverse effects as they are the main wellspring of vitamin D blend in the skin. According to Sayed Aliul Hasan Abdi's 2022 paper, the sunscreen ingredient octocrylene interacts with vitamin D receptors and the enzyme CYP2R1, suggesting a significant risk of abnormal vitamin D levels. Studies and their results suggest that sunscreen may have some impact on vitamin D biosynthesis.

Conclusion

Vitamin D is ostensibly quite possibly of the main fat-solvent nutrient, and its job in calcium and phosphorus maintenance has been considered. Its potential and its relationship to other physiological cycles have received more attention in recent years. SPF 15 and SPF 30 sunscreens block UVB beams and obstruct vitamin D ingestion. The results of this study suggest that a non-vegan diet is preferable to a diet that emphasizes vegetables.

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