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Research Article

Gender variation of Vit. D levels in Hair and Serum

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Abstract

Background: To put it simply, vitamin D is a prohormone. A healthy plasma vitamin D level is indicative of 'good' health. Vit D is necessary for calcium metabolism and bone mineralization due to its anti-inflammatory and immunomodulatory properties, and regulation of keratinocyte differentiation and proliferation. It also affects the hair cycle, and its role in hair loss is under constant research . **Aim and objectives:** to evaluate serum and hair levels of vitamin D according to Gender . **Subjects and methods:** In this cross-sectional research; Circulating 25(OH)D levels were recorded in 80 cases from Dermatology Outpatient Clinic of Minia University Hospital using ELISA kits . **Results:** In males; serum vitamin D levels was 17-31 ng/ml, with a mean ±SD 24.2 ± 3.4. In females; Serum vitamin D levels range between 17-30 ng/ml, with a mean ±SD 23.2 ± 2.8. In males, the hair vitamin D level was 0.1-1.86 ng/ml, with a mean ±SD 0.8 ± 0.4. In females; hair vitamin D levels range between 0.05-1.98 ng/ml, with a mean ±SD 0.8 ± 0.4. There was non-statistical difference between participants regarding hair and serum level vit D. **Conclusion:** No significant variations in serum and hair vit D among males and females.

Keywords: Gender; serum; Hair; vitamin D

Introduction

Bone and calcium metabolism are controlled by vitamin D, a serosteroid hormone. Vitamin D level and extra-skeletal health have been linked in recent decades. Autoimmune disorders, metabolic syndrome, and neuropathic pain are strongly related to vit D deficiency [(1)].

One common nickname for vit D is "sunshine vitamin." Sunlight's ultraviolet-B (UVB) rays cause 7-dehydrocholesterol (provit D) in the skin to be transformed into previtamin D, and from there into vitamin D via isomerization. Vitamin D status may be affected by a wide variety of circumstances, from those in the immediate environment to those in the individual. Whether or not there is enough UVB light to induce cutaneous vitamin D production depends on environmental parameters including latitude and season [(2)]. Vitamin D status may change depending on a person's age, race, weight, level of physical activity, food, and profession. Individual and environmental variables interact in complicated ways to determine vitamin D levels in the blood. [(3)]

Standard vit D status monitoring relies on measuring serum 25-hydroxy vit D (25(OH) D). Vitamin D status is considered appropriate when the serum 25(OH)D conc is between 30-150 ng/mL, and unsatisfactory when it is below 30 ng/mL (hypovitaminosis D), as stated in the 2011 Endocrine Society Clinical Practice Guidelines. Vit D insufficiency or deficiency is indicated by a serum 25(OH) D concentration of 20-30 ng/mL or <20 ng/mL. [(4)].

Around a billion individuals worldwide have low or deficient vitamin D levels, making vitamin D insufficiency an underrecognized epidemic [(5)].

Growing evidence reveals a connection among inadequate vit D and non-skeletal illnesses, which might have far-reaching health consequences; however, these results must still be verified by well-designed controlled experiments [6]. Skin pigmentation, high latitude, and excessive sunscreen, covering Large portion of the body with clothing, engaging in sedentary behaviours, preferring to spend time indoors, being overweight, having a high body mass index (BMI), being elderly, having a chronic disease, being exposed to air pollution, and having a family history of vitamin D deficiency are all risk factors leading to inadequate sunlight exposure and thus vit D deficiency [7].

The widespread distribution of vit D receptors across cell types implies that vit D has important physiological roles beyond those related to calcium and bone metabolism [8].

The role of vitamin D in the proliferation and differentiation of keratinocytes is well established, while its function in hair follicle biology is under constant research. Most common non-scarring alopecies include telogen effluvium, androgenetic alopecia, and alopecia areata [9]. Hair loss has a significant negative impact on the quality of life of patients, both socially and psychologically. Given the regulatory role of vitamin D in the rapid turnover of the matrix cells within the hair follicles, many studies have reported low levels of serum 25 (OH) D in patients with non-scarring alopecia, which indicate its potential role in the pathogenesis of hair loss [10].
We aimed to compare vitamin D levels in the serum and hair of both genders.

Patients and Methods

This research was carried out on 80 subjects chose from Dermatology Outpatient Clinic of Minia University Hospital after approval of the Committee for Postgraduate Studies & Research of Minia University. This was conducted during the period from first of August 2021 to end of August 2022 .

Vitamin D was detected using Human 25 Dihydroxy vitamin D enzyme-linked immune-assay (ELISA) Kit. (Calbiotech, Inc) 1935 Cordell Ct, El Cajon, Ca 92020 USA. Web www.calbiotech.com .

Statistical analysis

IBM SPSS 26.0, an American statistical package programme, was applied to the data analysis. Category data were presented as no&%, and quantitative data as means ± SD, medians & ranges (where applicable), and minimums & maximums (when applicable) for parametric and nonparametric measures, respectively. If the p value of a test is less than.05, the result is sig.

Results

Participants' ages varied from 19-63 years old, with a mean± SD 33.3 ± 9.1. 5
In males, the range of serum vitamin D levels was 17-31 ng/ml, with a mean ±SD 24.2 ± 3.4. In females; Serum vitamin D levels ranged between 17-30 ng/ml, with a mean ±SD 23.2 ± 2.8. There was non-statistical difference between participants regarding serum level vit D (P= 0.1542). Table 1

As regards vitamin D levels in hair, in males, it was ranged from 0.1-1.86 ng/ml, with a mean ±SD 0.8 ± 0.4. However, in females; Hair vitamin D levels range between 0.05-1.98 ng/ml, with a mean ±SD 0.8 ± 0.4. There was non-statistical difference between participants regarding hair serum level vit D (P =1).table 2

Table 1: Serum vitamin D in studied cases regarding gender:

Serum vitamin D	Mean ± SD	Range	P value
Males	24.2 ± 3.4	17-31	0.1542
Females	23.2 ± 2.8	17-30	

Table (2): Hair vitamin D in studied cases regarding gender:

Hair vitamin D	Mean ± SD	Range	P value
Males	0.8 ± 0.4	0.1-1.86	1
Females	0.8 ± 0.4	0.05-1.98	

Discussion

Older adults often have suboptimal vitamin D level because their skin does not convert 25(OH)D as well as the skin of younger people due to a decrease in 7-dehydrocholesterol in the dermis and epidermis, which is involved in the production of vit D, sub nutrition and inadequate diet, obesity and chronic disease [11,12].

In the study, no detectable distinctions among male and female as regards age. Meanwhile, we found a non-statistical difference between participants regarding hair vit D level.

In their study, Yan et al., [13] measured the vit D levels of residents of Jinzhong City in northern China & examine the correlation between sex and blood vitamin D concentrations. There were no substantial variations in age between the sexes, and the researchers also didn't find any differences in the demographics of the study's participants .

Research by Abudawood et al., which corroborate our results, is also worth noting [14]. Its objectives were to compare male & female T2DM patients in Riyadh, Saudi Arabia, for their blood levels of vit D, HBA1c, and lipid profile, and to examine the relationship among these vit D levels & those of HbA1c and lipids. Diabetic participants, both male and female, had substantially higher HbA1C levels than control subjects .

Also, a research by Gu et al., confirms our results[15]. Selected individuals from each sex were compared on a number of baseline characteristics. Female subjects showed greater 25(0H) D and HDL-C levels and lower total lumbar BMD than their male counterparts.

An additional investigation by Joukar et al.,[16] reported that Among the male population, researchers discovered that those who were overweight or obese were more likely to be VD deficient than those who were at a healthy weight. Also, men' serum 25 (OH) D levels were weakly inversely linearly related to their BMI. In contrast, females did not show any statistically significant relationships among BMI and serum 25 (OH)D levels. For men, higher BMI was linked to lower ranks of blood vit 25 (OH) D.

Banihashemi et al., [17] who reported significant decreased levels of Vitamin D in patients with female pattern hair loss (FPHL) when compared with healthy controls. Moreover, Sanke S et al., [18], reported that there were significant decrease in levels of Vitamin D3 in males with androgenetic alopecia.

The above-mentioned assessments concluded that serum and hair vitamin D levels were not substantially different across sexes.

Meanwhile, the relatively small number of the included patients is considered a limitation of the study. Moreover, future studies should investigate a larger number of patients to confirm and clarify our results and to compare vitamin D levels in both sexes in serum and hair in different hair loss disorders.

References

1. Chen J-Y, Lin Y-T, Wang L-K, Hung K-C, Lan K-M, Ho C-H, et al., Hypovitaminosis D in postherpetic neuralgia—high prevalence and inverse association with pain: a retrospective study. Nutrients. 2019;11(11): 2787.
2. Vu LH, Whiteman DC, van der Pols JC, Kimlin MG, Neale RE. Serum vitamin D levels in office workers in a subtropical climate. Photochem Photobiol. 2011;87(3): 714–20.
3. Coppeta L, Papa F, Magrini A. Are Shiftwork and Indoor Work Related to D3 Vitamin Deficiency? A Systematic Review of Current Evidences. J Environ Public Health. 2018 Sep 10;2018:8468742.
4. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP, et

al., Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2011;96(7):1911–30.
5. Sanghera DK, Sapkota BR, Aston CE, Blackett PR. Vitamin D status, gender differences, and cardiometabolic health disparities. Annals of Nutrition and Metabolism. 2017;70(2):79-87.
6. Hossein-nezhad A, Holick MF. Vitamin D for health: a global perspective. In: Mayo clinic proceedings. Elsevier; 2013. p.720–55.
7. Khan H, Kunutsor S, Franco OH, Chowdhury R. Vitamin D, type 2 diabetes and other metabolic outcomes: a systematic review and meta-analysis of prospective studies. Proc Nutr Soc. 2013;72(1):89–97.
8. Ross AC, Taylor CL, Yaktine AL, Del Valle HB. Institute of Medicine (US) Committee to Review Dietary Reference Intakes for Vitamin D and Calcium. Dietary reference intakes for calcium and vitamin D. Natl Acad Press doi. 2011;10:13050 .
9. Gerkowicz A, Chyl-Surdacka K, Krasowska D, Chodorowska G. The role of vitamin D in non-scarring alopecia. International journal of molecular sciences. 2017 Dec 7;18(12): 2653 .
10. Saini K, Mysore V. Role of vitamin D in hair loss: a short review. J Cosmet Dermatol. 2021 Nov;20(11):3407-3414.
11. Orwoll E, Nielson CM, Marshall LM, Lambert L, Holton KF, Hoffman AR, et al., Vitamin D deficiency in older men. J Clin Endocrinol Metab. 2009;94(4):1214–22.
12. Holick MF. Resurrection of vitamin D deficiency and rickets. J Clin Invest. 2006;116(8):2062–72.
13. Yan X, Zhang N, Cheng S, Wang Z, Qin Y. Gender differences in vitamin D status in China. Med Sci Monit Int Med J Exp Clin Res. 2019;25:7094.
14. Abudawood M, Tabassum H, Ansar S, Almosa K, Sobki S, Ali MN, et al., Assessment of gender-related differences in vitamin D levels and cardiovascular risk factors in Saudi patients with type 2 diabetes mellitus. Saudi J Biol Sci. 2018;25(1):31–6.
15. Gu P, Pu B, Chen B, Zheng X, Zeng Z, Luo W. Effects of vitamin D deficiency on blood lipids and bone metabolism: a large cross-sectional study. J Orthop Surg Res. 2023;18(1):1–10.
16. Joukar F, Asgharnezhad M, Naghipour M, Mojtahedi K, Salari A, Mansour-Ghanaei A, et al., Gender-related differences in the association of serum levels of vitamin D with body mass index in northern Iranian population: the PERSIAN Guilan Cohort Study (PGCS). BMC Nutr. 2022;8(1):1–8 .
17. Banihashemi M, Nahidi Y, Meibodi NT, Jarahi L, Dolatkhah M. Serum Vitamin D3 Level in Patients with Female Pattern Hair Loss. Int J Trichology. 2016 Jul-Sep;8(3):116-20.
18. Sanke S, Samudrala S, Yadav A, Chander R, Goyal R. Study of serum vitamin D levels in men with premature androgenetic alopecia. Int J Dermatol. 2020 Sep;59(9):1113-6.