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Original Research

Assessment of vitamin D levels in melanoma patients

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ABSTRACT:

Background: The present study was conducted for assessing vitamin D levels in melanoma patients. **Materials & methods:** A total of 50 patients with confirmed diagnosis of Melanoma were enrolled. Complete demographic and clinical details of all the patients were obtained. Each participant underwent a comprehensive physical assessment along with an extensive dermal evaluation. All the patients were recalled in the morning. Blood samples were obtained from all the patients and were sent for assessment. Serum vitamin D levels were evaluated in all the patients. Statistical analysis was conducted utilizing the Statistical Package for Social Sciences version 21. Descriptive statistics were presented as mean ± SD, or median and interquartile range. A univariate analysis was performed to assess the level of significance. **Results:** A total of 50 patients were evaluated. Mean age of the patients was 58.3 years. 80 percent of the patients were more than 40 years of age. 76 percent of the patients were males while 60 percent of the patients were of urban residence. Mean serum vitamin D levels in melanoma patients was 28.3 ng/ml. Vitamin D deficiency was seen in 60 percent of the melanoma patients. **Conclusion:** In patients with melanoma, serum vitamin D levels have been increasingly recognized as a potential prognostic biomarker. Adequate or higher serum vitamin D levels might appear to correlate with improved overall survival and reduced recurrence rates.

Key words: Melanoma, Vitamin D

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INTRODUCTION

Vitamin D, a vital secosteroidprehormone, plays a central role in maintaining calcium equilibrium and promoting skeletal mineralization. It is synthesized in the skin following ultraviolet B (UVB) exposure and is also derived from dietary sources and supplements[1]. Once synthesized or ingested, vitamin D is metabolized in the liver into 25-hydroxyvitamin D [25(OH)D], which serves as the principal circulating indicator of vitamin D status in the body[12]. This form undergoes further hydroxylation in the renal cortex to yield 1,25-dihydroxyvitamin D [1,25$(OH)_2$D], the physiologically active metabolite responsible for modulating calcium and phosphate homeostasis[2]. Although 1,25$(OH)_2$D is biologically active, it is not ideal for assessing vitamin D status due to its brief half-life and stringent regulatory feedback mechanisms[3]. In contrast, serum 25(OH)D is a more reliable biomarker, as it reflects both dermal synthesis and nutritional intake[4]. Optimal serum 25(OH)D levels remain debated, but levels between 35–55 ng/mL are widely regarded as sufficient[4–6]. Notably, concentrations above 30 ng/mL are linked to improved overall health, while levels between 36 and 48 ng/mL may contribute to cancer risk reduction[6]. For older adults, a daily intake of 800–1,000 IU (20–25 mcg) of vitamin D is generally required to maintain these optimal serum concentrations[6].Vitamin D binds to the vitamin D receptor (VDR) resulting in transcription of a number of genes playing a role in inhibition of MAPK signalling, induction of apoptosis and cell-cycle inhibition, and therefore vitamin D has anti-proliferative and pro-apoptotic effects in cells of many lineages. It also has suppressive effects on adaptive immunity and is reported to promote innate immunity. Here we review data on vitamin D and melanoma.[7]Hence; the present study was conducted for assessing vitamin D levels in melanoma patients.

MATERIALS & METHODS

A total of 50 patients with confirmed diagnosis of Melanoma were enrolled. Complete demographic and clinical details of all the patients were obtained. Each participant underwent a comprehensive physical assessment along with an extensive dermal evaluation. All the patients were recalled in the morning. Blood samples were obtained from all the patients and were sent for assessment. Serum vitamin D levels were evaluated in all the patients. Statistical analysis was conducted utilizing the Statistical Package for Social Sciences version 21. Descriptive statistics were presented as mean ± SD, or median and interquartile range. A univariate analysis was performed to assess the level of significance.

RESULTS

A total of 50 patients were evaluated. Mean age of the patients was 58.3 years. 80 percent of the patients were more than 40 years of age. 76 percent of the patients were males while 60 percent of the patients were of urban residence. Mean serum vitamin D levels in melanoma patients was 28.3 ng/ml. Vitamin D deficiency was seen in 60 percent of the melanoma patients.

Table 1: Demographic data

Variable	Number	Percentage
Age less than 40 years	10	20
Age more than 40 years	40	80
Male	38	76
Females	12	24
Rural residence	30	60
Urban residence	20	40

Table 2: Vitamin D levels

Vitamin D levels	Value
Mean	28.3 (ng/ml)
SD	1.2
Vitamin D deficiency	60%

DISCUSSION

Vitamin D is a fat-soluble steroid hormone, which is essential to health and for which epidemiological studies suggest a role in autoimmune disease, infections, cardiovascular disease and cancer. It is ingested in foods such as oily fish and supplements, so that average levels vary between countries, but most individuals worldwide make most of their vitamin D as a result of the effects of sun exposure on the skin. Many studies in different populations around the world have in recent years shown that sub-optimal levels of vitamin D (<70 nmol/L) are common.[8, 9]

A total of 50 patients were evaluated. Mean age of the patients was 58.3 years. 80 percent of the patients were more than 40 years of age. 76 percent of the patients were males while 60 percent of the patients were of urban residence. Mean serum vitamin D levels in melanoma patients was 28.3 ng/ml. Vitamin D deficiency was seen in 60 percent of the melanoma patients. J. A. Newton Bishop et alsuggested that taking vitamin D reduced the risk of relapse from melanoma (OR 0.6, 95% CI: 0.4, 1.1). Non-relapsers had higher mean 25-dihydroxyvitamin D3 levels than relapsers (49 nmol/L compared with 46, p=0.3). Cohort study Higher 25-dihydroxyvitamin D3 levels were associated with lower Breslow thickness at diagnosis and were independently protective of relapse and death: hazard ratio (HR) for relapse free survival (RFS) 0.76, 95% CI: (0.64, 0.96), for a 20nmol/L increase in serum level. There was evidence of interaction between the vitamin D receptor (VDR) BsmI genotype and serum 25-dihydroxyvitamin D3 levels on RFS. The pilot study provided preliminary evidence for a role for vitamin D in outcome from melanoma. The cohort study provided further evidence that higher 25-dihydroxyvitamin D3 levels, at diagnosis, were associated both with thinner tumors and better survival, independent of Breslow thickness, from melanoma.[10]

Davies et al reported the determinants of serum levels of vitamin D in a UK melanoma case–control study benefitting from detailed exposure and genotyping data. Sun exposure, supplemental vitamin D, and SNPs reported to be associated with serum levels were assessed as predictors of a single serum 25-hydroxyvitamin D3 measurement adjusted for season, age, sex, and body mass index. Adjusted analyses showed that vitamin D levels were sub-optimal especially in the sun-sensitive individuals (−2.61 nmol/L, p = 0.03) and for inheritance of a genetic variant in the GC gene coding for the vitamin D-binding protein (−5.79 for heterozygotes versus wild type, p = <0.0001). Higher levels were associated with sun exposure at the weekend in summer (+4.71 nmol/L per tertile, p = <0.0001), and on hot holidays (+4.17 nmol/L per tertile, p = <0.0001). In smoothed scatter plots, vitamin D levels of 60 nmol/L in the non-sun-sensitive individuals were achieved after an average 6 h/day summer weekend sun exposure but not in the sun-sensitive individuals. Users of supplements had levels on average 11.0 nmol/L higher, p = <0.0001, and achieved optimal levels irrespective of sun exposure. Sun exposure was associated with increased vitamin D levels, but levels more than 60 nmol/L were reached on average only in individuals reporting lengthy exposure (≥12 h/weekend).[11]Tang, J.Y et al performed a nested case–control study in ambulatory, elderly men enrolled in the Osteoporotic Fractures in Men (MrOS) Study. Health habit and medical history, including self-reported history of NMSC were recorded and 25(OH)D levels were measured on serum collected at baseline from a random sample of Caucasian MrOS subjects. Mean age (73 ± 5), BMI, daily vitamin D and calcium intake were similar in the men with (n = 178) and without NMSC (n = 930), but higher levels of 25(OH)D were associated with a decreased risk of having a history of NMSC (P trend = 0.04). Men in the highest quintile of 25(OH)D (>30 ng/mL) had

47% lower odds of NMSC (95% CI: 0.30–0.93, p = 0.026) compared to those in the lowest quintile.[12]

CONCLUSION

In patients with melanoma, serum vitamin D levels have been increasingly recognized as a potential prognostic biomarker. Adequate or higher serum vitamin D levels might appear to correlate with improved overall survival and reduced recurrence rates.

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