

A Comparison of Vitamin D Levels in Patients with Acne Vulgaris and Healthy Individuals

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Abstract

Study Objective: It is a common opinion that vitamin D plays a role in many immune system disorders. This study aimed to determine vitamin D levels in patients with acne vulgaris.

Methodology: The study sample included 90 patients who came to the outpatient dermatology clinic of Malatya Public Hospital between March 2015 and June 2015, and were diagnosed with cystic nodular acne clinically. The control group included 67 voluntary healthy individuals. The 25-hydroxyvitamin D3 [25-(OH) vit D3] levels were recorded for both groups.

Findings: In the group of patients with acne, the 25-(OH) vit D3 level was 18.28±9.92 (reference interval 10–40 ng/mL), and it was 15.40±10.92 in the control group. When the two values were compared statistically, the result was p:0.924 (p>0.05) and there was no statistically significant difference.

Conclusion: It is believed that vitamin D plays a role in the etiopathogenesis of acne vulgaris due to its anti-inflammatory and antimicrobial properties. The studies conducted with larger patient sets can provide a clearer view of the correlation between vitamin D and acne.

КӘДІМГІ БЕЗЕУЛЕРІ БАР ПАЦИЕНТТЕР МЕН ДЕНІ САУ СУБЪЕКТИЛЕРДЕ D ВИТАМИНІ ДЕҢГЕЙІН САЛЫСТЫРУ

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ТҰЖЫРЫМДАМА

Зерттеу мақсаты: D витамині иммундік жүйенің барлық бұзылуларында маңызды рөл атқарады деген пікір кең таралған. Бұл зерттеу кәдімгі безеулері бар пациенттерде D витамині деңгейін айқындауға бағытталған.

Әдістеме: Зерттеуге 90 пациент жұмылдырылды, олар Малаатья қаласының Мемлекеттік ауруханасы дерматологиясының амбулаторлық бөліміне 2015 жылғы наурыз-маусым айлары аралығында келді, оларға түйінді-кистозды акне клиникалық диагнозы қойылды. Бақылау тобында 67 ерікті дені сау субъектілер болды. Екі топта да D 25-гидроксивитамині деңгейі [D325-(OH) вит.] тіркелді.

Нәтижелері: Акне бар пациенттер тобында D3 25-(OH) витамині деңгейі 18.28±9.92 (референттік интервал 10–40 нг/мл), ал бақылау тобында 1 және 15.40±10.92 құрады. Осы екі мәндерге статистикалық салыстыру өткізгеннен кейін нәтиже p:0.924 (p>0.05) құрады және статистикалық елеулі айырмашылықтар анықталмады.

Қорытынды. Кәдімгі безеулердегі этиопатогенезде D витамині өзінің қабынуға қарсы және микробқа қарсы қасиеттерінің арқасында рөл атқарады деген болжам бар. Пациенттерді аса іріктеумен өткізілген зерттеулер D витамині мен акне арасындағы байланыс туралы аса нақты ұғым беруі мүмкін.

СРАВНЕНИЕ УРОВНЯ ВИТАМИНА D У ПАЦИЕНТОВ С ОБЫКНОВЕННЫМИ УГРЯМИ И ЗДОРОВЫХ СУБЪЕКТОВ

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РЕЗЮМЕ

Цель исследования: Широко распространено мнение о том, что витамин D играет роль во многих нарушениях иммунной системы. Данное исследование нацелено на определение уровня витамина D у пациентов с обыкновенными угрями.

Методология: В исследование было привлечено 90 пациентов, которые обратились в амбулаторное отделение дерматологии Государственной больницы г. Малатья в период с марта по июнь 2015 года, и которым поставили клинический диагноз кистозный узловатый акне. Контрольная группа включала 67 добровольных здоровых субъектов. В обеих группах был зарегистрирован уровень 25-гидроксивитамина D [25-(OH) вит. D3].

Результаты: В группе пациентов с акне, уровень 25-(OH) вит. D3 составил 18.28±9.92 (референтный интервал 10–40 нг/мл), и 15.40±10.92 в контрольной группе. После проведения статистического сравнения этих двух значений, результат составил p:0.924 (p>0.05) и статистически значительного различия выявлено не было.

Выводы: Полагается, что витамин D играет роль в этиопатогенезе обыкновенных угрей благодаря своим противовоспалительным и противомикробным свойствам. Исследования, проведенные с более крупной выборкой пациентов, могут предоставить более четкое представление о связи между витамином D и акне.

Ключевые слова: витамин D - обыкновенные угри - метаболизм костной ткани.

Introduction

Acne is a chronic and inflammatory disease that affects the pilosebaceous unit of the skin. It is commonly believed that increased secretion of sebum, abnormal follicular keratinization, microbial colonization, and inflammation play roles in the pathogenicity of acnes (1). Vitamin D is one of the vitamins that melt in oil. Its greatest effect is on the mineralization of calcium, phosphorus, and bones. The studies in recent years have proven the importance of vitamin D and demonstrated that it is involved in hormonal activity, differentiation and proliferation of cells, and regulation of angiogenesis and apoptosis.

This study compared vitamin D levels in patients diagnosed with cystic nodular acne with those in healthy individuals and aimed to determine the vitamin D level in patients with acne.

Materials and Methodology

The study sample included 90 patients who came to the outpatient dermatology clinic of Malatya Public Hospital between March 2015 and June 2015, and were diagnosed with severe cystic nodular acne clinically. The control group included 67 voluntary healthy individuals. Control group was consisted of healthy adults, without any systemic disease. Blood samples gathered at 9.00-12.00 am. The patients who had been using any systematic drug for the past 1 month as well as those

with a systematic illness were not included in the study. The patients with abnormal calcium, alkaline phosphatase (ALP), parathormone (PTH), and phosphorus levels, which are involved in vitamin D metabolism, were not included in the study. The researcher recorded 25-hydroxy vitamin D3 [25-(OH) vit D3] levels for both groups.

The statistical analysis of the data was performed using the SPSS 23 software package (SPSS, IL, USA). The researcher used the Shapiro–Wilk test to examine the fitness of the variables for the normal distribution. The researcher also used Wilcoxon test in dependent groups and Mann-Whitney U test in the independent groups for the statistical analysis of the variables with an abnormal distribution. When P was less than 0.05, the result was considered statistically significant.

Results

Of 90 patients in the sample, 51 (57.3%) were females and 39 (42.7%) were males. The oldest patient was 50 years old, and the youngest one was 16 years old (average age: 23.55±5.58 years). The control group included 67 healthy individuals. Of them, 40 (60.5%) were females and 27 (39.5%) were males. The oldest participant in this group was 50 years old, and the youngest one was 18 years old (average age: 24±7.13 years) (Table 1).

Table 1 The characteristics of patients and controls

	Patient (n=90)	Control (n=67)
Age, years	23.55±5.58	24±7.13
Female, n (%)	51 (57.7)	40 (60.5)
Male, n (%)	39 (42.7)	27 (39.5)
25'(OH) Vit D3, ng/mL	18.28±9.92	15.40±10.92

In the group of patients with acne, the 25-(OH) vit D3 level was 18.28±9.92 (reference interval 10–40 ng/mL), and it was 15.40±10.92 in the control group. When the two values are compared statistically, the result was p=0.924 (>0.05) and there was no statistically significant difference (Table 2).

Discussion

Acne vulgaris is a skin disease that mainly affects adolescents, has a multifactorial etiology, and involves the formation of papules, pustules, comedones, and cysts on the

skin. It is also a chronic disease that has social and psychological effects (4).

Vitamin D is one of the vitamins that dissolve in oil. It is a sterol with functions similar to those of hormones. Most of the vitamin D in the human body (90%–95%) is synthesized in the skin, and a very small part of it is derived from dietary intake (5). In the last two decades, the immuno-regulatory effect of vitamin D has become a subject of interest. The deficiency of vitamin D is associated with many diseases characterized by inflammation,

malignancy, auto-immune disorders, and chronic infections (6). Vitamin D influences the secretion of PTH, adaptive immune response, and cell proliferation. It also increases the oscillation in cells, starts the immune response, and stimulates cell proliferation. The vitamin D metabolites modulate the tissue-specific immune responses, and hence are effective in treating and preventing inflammatory diseases and immune system disorders (7, 8). It has been proven that vitamin D is related to many auto-immune diseases including type 1 diabetes, multiple sclerosis, and Crohn's disease (9).

Vitamin D also plays a major role in many dermatological diseases. It is used in treating psoriasis due to its antiproliferative effect, vitiligo due to its stimulating effect on the synthesis of melanocytes, and scleroderma and generalized morphea due to its inhibitory effect on collagen synthesis by inhibiting the function of active T cells and limiting their infiltration (10, 12).

Toossi et al. (13) conducted a study with 39 patients with acne and 40 healthy individuals, and found no significant difference between 25-(OH) vit D3 levels of patients with acne and healthy individuals. They also observed no correlation between the severity of acne and vitamin D level. Another study conducted with 43 patients with acne found that the vitamin D level was lower in patients with acne (14).

Depression and nutritional problems have been associated with the development of acne vulgaris for many years. As an antioxidant, vitamin D may contribute to the development of acne (13, 14). Some authorities think that vitamin D influences

the activities of superoxide dismutase(SOD) and glutathione peroxidase (GSH-Px), which are found in the papulopustular acne (15). It is a common belief that milk increases the secretion of insulin-like growth factor, which is important at the beginning of the disease. On the contrary, the antimicrobial property of vitamin D has been studied by many authors from different cultures, focusing on the role of vitamin D in the treatment of acne vulgaris (16, 17). Only few studies are available in the literature examining the correlation between vitamin D and acne. The results of these studies are conflicting. In the present study, the vitamin D level in the group of patients with acne was insignificantly high. It is believed that vitamin D, which has an inflammatory characteristic, might have increased due to chronic inflammation in patients with acne.

Conclusion

Vitamin D plays a major role in many dermatological diseases thanks to its immunomodulatory property. It is thought that vitamin D plays a role in the etiopathogenesis of acne vulgaris. In our study severe nodulocystic acne patients were involved. Level of vit D was found higher than control group without any statistically significance. Vit D levels may be increased to inhibit the inflammation in acne group. Studies conducted with larger patient sets in the future can provide a clearer understanding of the correlation between vitamin D and acne vulgaris.

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