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ACNE VULGARIS AND ITS ASSOCIATION WITH DIETARY INTAKE

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ABSTRACT

Background: Acne is one of the most common skin diseases, which affects people in both developing and developed countries, dietary habits may play a non-negligible role in the development of acne. **Objective:** this study aimed to investigate the association of dietary intake and acne. **Method**: This case-control study was conducted between the 1st of December 2023 and March 26, 2024. The participants were from Al-Kindy College of medicine. A convenient sample of 200 students, 100 students with acne vulgaris and 100 controls participated in the current study. Participants were between the ages of 18 to 23 years; the study was done on a voluntary basis and all the participants filled in a paper questionnaire. **Results:** Eating chocolate, sweets and potato chips often for the past three months was significantly associated with acne vulgaris. **Conclusions:** There is an association between eating chocolate, sweets and potato chips frequently and acne vulgaris.

INTRODUCTION

Acne vulgaris

The skin is the body's main interface with the external world. It is considered as the body's major public relations tool. Skin disorders have a negative impact on individuals, especially in acceptance of their own image and in their quality of life.^[1] Acne vulgaris is one of the most common skin diseases in the world, which affects people in both developing and developed countries.^[2]

It can be defined as a chronic inflammatory disorder affecting the pilosebaceous units. It usually affects most individuals at some point in their lives, especially during adolescence. In United Kingdom 85% of adolescents, are affected by acne vulgaris. Acne, characterized by seborrhea, comedones, papules, pustules, nodules, cysts, and in some cases scars and keloids that persist for the rest of life.^[3]

Acne is often visible on the face, affecting body image and socialization. Therefore, it is not surprising that an individual with facial acne may develop significant psychosocial disability.^[4]

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Adolescents are constantly concerned with images of perfection. Studies on the psychological impact of acne had documented dissatisfaction with appearance, embarrassment, self-consciousness, and low self-esteem.^[5] The young age group, patients are not mature enough to face such an impact caused by deforming acne lesions. Considering all the negative repercussions in a psychosocial context, acne has great potential for jeopardizing the quality of life of these individuals.^[4]

The risk factors for acne vulgaris that are reported in many literatures were family history, hormonal effect, oily skin, facials (facial massage), cosmetics, friction, pressure, repeated irritation, sweat, menstruation, pregnancy, stress, sunlight, smoking, drug-induced acne.^[6,7]

Diet and acne

There are numerous factors that contribute to the occurrence of acne in the human body rather than a single cause, the relationship between diet and acne is a topic of ongoing research, and while diet is not the sole cause of acne, there is evidence of an association.^[8]

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History of the relationship between diet and acne

The relationship between diet and acne had been highly debated, where in 19th and first half of 20th centuries, the relation between diet and acne was addressed strongly and all dermatologists recommended avoiding certain kinds of food (chocolate, fats, and sweets), then during the second half of 20th century several studies were conducted and dismissed the relationship between diet and acne and considered it as a myth. However, during the last two decades, the relationship appeared on the surface again and a lot of studies were conducted that addressed the correlation between diet and acne.^[9,10]

Saudi Arabia, Alraddadi et al 2022 reported that respondents having acne identified chocolate alone or in combination with fast food, nuts, or soft drinks as aggravating factors for acne.^[11] Sulaimani, Al-Emaam et al 2020 reported that diet influenced acne complications. Behavioral modification of adolescents especially regarding dietary habits and enforcement on fiber-rich diet omega3 fatty acids should be encouraged.^[12]

AIM OF THE STUDY

This study aimed to investigate the association of dietary intake and acne.

METHOD

Study Design

This study was designed as a case-control study.

Settings and duration

The study was conducted in Al-Kindy College of medicine, between the 1st of December 2023 and March 26, 2024.

Study population and sampling procedure

The sample study included students from a Al-Kindy medical college. A convenient sample of 200 students participated in the current study.

The cases (100) with acne vulgaris were identified and distinguished by a dermatologist, and the controls were (100).

Participants were between 18 to 23 years of age, the frequency of dietary products intake for the last three months was collected through face-to-face interviews using an adapted, structured, and validated questionnaire from cases and controls, which consisted of two parts: the first part is demographic data (age, gender, chronic disease, marital status, family history of acne and treatment use), and the second part was regarding dietary habits for the past three months. This questionnaire was presented to dermatologists for validation.

Inclusion criteria

Students in the age of 18-23 years, from al-Kindy medical college who agreed to participate in the study.

Exclusion criteria

- A recent treatment with acne.
- Use of steroids or acne-inducing drugs.
- Mental health disorders.
- Autoimmune disease.
- Patient on hormonal therapy

This was self-reported and milk was dichotomized into "seldom" (never, 1-6 glasses per week, 1 glass daily) versus "often" (2 or more glasses daily) The other dietary variables (chocolate/sweets and potato chips, nuts, yoghurt, ice-cream) were all dichotomized into "seldom" (never, 1-3 times a month, 1-3 times a week) versus "often" (4-6 times a week, 1-2 times a day, and 3 or more times a day).

Method of data collection

A paper questionnaire was used to collect the data. The questionnaire used was adopted from previous studies measuring the same studied variables, the questionnaire was revised by a supervisor and a panel of experts in Al-Kindy College of Medicine (Dermatology department) and their modification and advice regarding the proposed questionnaire were taken into consideration.

Ethical and official approval

The conduction of the study was approved by the Ethical and Scientific Committee at Al Kindy College of Medicine.

Permission was obtained from Al Kindy College of Medicine. The permission of all students who participated in the study was obtained. All participants were informed that their responses would remain confidential, and this was a prerequisite for data collection.

Statistical analysis

Data was assessed using Statistical Package for Social Sciences (SPSS, IBM SPSS Statistics for Windows, Version 23.0. Armonk, New York) version 23.0. Chisquare test was performed to test the significance of association between categorical variables. P-value< 0.05 will be considered as significant.

RESULTS

A total of 200 subjects participated in this study, comprising 100 cases and 100 controls, distribution of case and control subjects as per gender and family history was shown in (table 1). Using chi-square test, there were statistically significant associations between acne vulgaris with female gender and family history among first-degree relatives (p-values=0.019 and 0.000 respectively).

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Table 1: Distribution of case and control subjects as per gender and family history.

Variables	Total	Cases	Control	p-value*
Gender				
Male	74	29	45	0.010*
Female	126	71	55	0.019
Family history of acne among first degree relatives				
At least 1 family member	94	76	18	
Nil	106	24	82	0.000^{*}
*p values <0.05 were considered significant.				

Table (2) shows the dietary intake and its relationship with acne. Using chi-square test the analysis showed highly significant associations of frequent chocolate, sweet and potato chips consumption in the last three months with having acne (p-values= 0.003,0.000 and 0.005 respectively). No statistically significant association was found between any of the other dietary elements with acne.

Table 2: Distribution of case and control subjectsaccording to their dietary intake.

	case	control	p-value
[Chocolate]			
Often	48	28	
Seldom	52	72	0.00375^{*}
[Sweets]			
Often	45	22	
Seldom	55	78	0.0057^{*}
[Potato chips]			
Often	56	17	
Seldom	44	83	0.000^{*}
[Nuts]			
Often	31	26	
Seldom	69	74	0.433
[Yoghurt]			
Often	35	29	
Seldom	65	71	0.363
[Ice cream]			
Often	19	16	
Seldom	81	84	0.57
[Milk]			
Often	15	10	
Seldom	85	90	0.285

*p values <0.05 were considered significant.

DISCUSSION

Acne vulgaris is a common skin disease, while neither life threatening nor physically debilitating, acne can affect social and psychological functioning.^[13]

In our study, being a female was associated with acne, this finding was in line with other studies.^[14,15] This may be explained due to hormonal factors, stress, cosmetics and skin care products.

We found a significant association between family history among first-degree relatives and acne in this study. Compatible with our findings, Di Landro *et al.* supported the importance of family history on the risk of acne.^[16] Monib KM *et al* reported that positive family history was an important risk factor in prediction and management of acne vulgaris.^[6]

The relationship between chocolate intake in the last three months and acne had been a subject of ongoing research^[17], in our study frequent chocolate intake was significantly associated with acne, this was in parallel with Chalyk N *et al*, as their study reported that dark chocolate consumption appeared to affect the facial skin of young, enhancing corneocyte desquamation and promoting bacterial colonization of the residual skin surface components and these changes might potentially contribute to acne development.^[18] additionally a more recent study in 2024, found a link between frequent chocolate consumption and acne.^[17]

Beyond chocolate, sweets were found to be associated with acne in this study. This finding was in line with previous studies.^[8,19]

High glycemic index, sugar content, hormonal and inflammatory responses may explain the association between chocolate intake and sweets intake with acne.^[17,18,19]

Frequent potato chips consumption was also associated with acne in this study, Aalemi AK *et al*, reported an association between chips intake and acne.^[20] Wei *et al*, found an association of fried food with acne.^[21]

Some researchers suggested that unhealthy fats can contribute to systemic inflammation and acne.^[22,23]

A high glycemic index, high oil and fat content and the processed nature of potato chips may explain the association between frequent consumption of potato chips and acne.^[8,21,24]

Although the number of subjects consumed nuts often were higher in case group compared to control group in this study (31 compared to 26 respectively) this association failed to reach a statistically significant level. Findings of previous studies were inconsistent, Taha S. *et al*, did not find an association between acne and consuming nuts,^[25] while Jung JY *et al*, reported that consumption of nuts was higher in acne group compared to control group.^[26] There was no association between acne with consuming yogurt, milk and ice cream often in the current study. A previous study reported that increased dairy consumption may have been proacnegenic in selected populations, such as those in which a Western diet is prevalent.^[8] Another study found that the development of acne was positively associated with whole and low-fat milk, whereas other types of dairy products had no associations.^[20] Suppiah TS *et al*, reported that there was no association between acne with yogurt and ice cream consumption.^[27] These different results may be due to the different methodology, types of dairy products consumed and self -reported dietary intake which can be inaccurate.

CONCLUSION

There is an association between gender and the development of acne pointing to a higher likelihood of developing acne in females.

A positive family history of acne among first degree relatives is associated with acne development, suggesting a genetic component to the condition.

The study suggested a potential association between frequent consumption of chocolate, sweets and potato chips in the last three months with the development of acne, implicating the need to avoid an unhealthy diet with a high glycemic index for skin health and overall wellbeing. However, there remains a need for more longterm, prospective and randomized controlled trials.

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