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Acne in medical students and their associated factors

Acné en alumnos de medicina humana y sus factores asociados

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Abstract

Introduction: The Acne is a multifactorial chronic inflammatory disease to affect the pilosebaceous unit present in the face, back and chest. In this research we wanted to know what the frequency was and the factors associated with the presence of acne in medical students.
Materials and Methods: A case-control study was carried out in students from 1st to 5th year of the Hermilio Valdizán National University School of Medicine. A 95% confidence interval with an alpha of 0.05 and a statistical power of 80% with a beta equal to 0.20 were considered.
Results: The average age was 22.31 + 3.22 years. The fruit consumption obtained significance as a protective factor (p = 0.04; OR = 6.09) . The anxiety was not significant (p = 0.59; OR = 1.34), as well as the nutritional status (p = 0.57; OR = 1.14) and the consumption of B vitamin supplement (p = 0.35 ; OR = 0.56). Significance was found in biological inheritance (p = 0.01; OR = 3.74 with lower range = 10.61 and higher range = 1.31).
Conclusions: The frequent consumption of fruits showed to act as a protective factor in the development of acne; additionally, it is also concluded that biological inheritance plays an important role in the acne occurrence.

Keywords: acne, diet, anxiety, body mass index, B vitamin, family medical history.

Resumen

Introducción: El acné es una enfermedad inflamatoria crónica de la unidad pilosebácea de origen multifactorial presente en cara, espalda y pecho. En este estudio quisimos conocer cuál era la frecuencia y los factores asociados a la presencia de acné en los estudiantes de medicina.
Materiales y Métodos: Se realizó un estudio de casos y controles, en alumnos de 1° a 5° año de la escuela de Medicina de la Universidad Nacional Hermilio Valdizán. Se consideró un IC de 95% con un alfa de 0,05 y una potencia de 80% con una beta igual a 0,20.
Resultados: La media de la edad fue de 22,31 + 3,22 años. El consumo de frutas obtuvo significancia (p=0,04; OR=6,09) como factor protector. La ansiedad no fue significativa (p=0,59; OR=1,34), asi como el estado nutricional (p=0,57; OR=1,14) y el consumo de suplemento vitamínico B (p=0,35; OR=0,56). Se encontró significancia en la herencia biológica (p=0,01; OR=3,74 con rango inferior=10,61 y rango superior=1,31).
Conclusiones: El consumo frecuente de frutas demostró actuar como factor protector en el desarrollo de acné; además, se concluye también que la herencia biológica juega un papel importante en el mismo.

Palabras clave: acné, dieta, ansiedad, índice de masa corporal, vitamina B, historia familiar.

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Introduction

The acne is a multifactorial chronic inflammatory disease to affect the pilosebaceous unit present in the face (99%), back (60%) and chest (15%). It is one of the most frequent dermatoses worldwide, it distinguishes several clinical types that can leave serious scars and produce great psychological impact that can alter the moods, interpersonal relationships and produce a deficient job performance causing economic losses (1).

Currently affects 1 in 10 people worldwide and an estimated 80 to 90% of adolescents have acne. In 2005 it was calculated that the global expenses to treat it represented more than 10% of the general expenses in the treatment of dermatosis. In 2016, it was estimated that the global acne market reached revenues of 3 billion dollars (2).

In France, acne is considered to be one of the three most frequent skin diseases as well as in England and the USA (3). Peru has a prevalence of 80-85% of adolescents between 13 and 18 years, being able to be associated with psychological and social deterioration (4). In our region, it represents 15.16% of the 50 most frequent dermatoses in the dermatology service to the EsSalud II Huanuco Hospital until at the 3 years ago, being of greater prevalence in adolescents and young adults with a predominance by the female sex (5), which is underestimated because it does not include the consultations that are made to the pediatrician or general practitioner both in the same center and in hospitals of the Ministry of Health. That is why the exact statistics in our region are currently unknown.

It has been shown that certain foods or type of diets also influence the presence or act as aggravating of acne. For example the milk products and their derivatives, especially skim milk, as well as all foods with high glycemic and lipid load (Western diet) have an important role in the pathogenesis of the acne that leads to an increase in body mass index (6). The Acne also has a close relationship with the psychic component such as the anxiety. The 44% of affected adolescents suffer from anxiety as is explaining by the president of the Sectional Center of the Spanish Academy of Dermatolo-

gy and Venereology (AEDV) (7).

The acne also is related to the consumption of some medications. The B vitamin complex in all it supplement types can generate the eruption of an acneiform rash or act as aggravating. The most affected population are the women (8). However, the mechanisms are still being elucidated and these are molecular processes of both the host and the microorganism (Propionibacterium acnes) (9).

Without a doubt, the acne is a very important disease. It has the same impact as other metabolic and chronic - degenerative diseases such as Diabetes, Arterial Hypertension, Rheumatoid Arthritis and others (10). Although this condition does not imply a risk of life, it can have a great impact on the self-esteem and in the social development of those who suffer from it, even generating suicidal ideas at some point in their lives.

The objective of this research it was to know the frequency and what factors are associated with the presence of acne in medical students during the 2018 period.

Materials and methods

A case-control study was conducted. The eligible population was students from the 1st to 5th year of the E.P. Human Medicine of UNHEVAL in the year 2018.

They was included students who are presents in classes regularly, with informed consent of their parents or tutors in the case of minors and that are present on the day of the data collection. The students with medical treatment for the acne or another prolonged treatment were excluded and also the students with others comorbidities.

For the cases that were established as students with acne it was obtained through a clinical diagnosis, for both sexes and of any age group and for the controls the students who did not present acne according to the clinical diagnosis were included regardless sex or age for all the cases.

Sample Size

For the calculation of the sample size, there was a total population of 341 students of the Professional School of Human Medicine from the 1st to the 5th academic year for a study of Cases and Controls with independent groups, we took the prevalence of each independent variable, taking in account of the characteristics of the study that most closely resemble our epidemiological reality (11). A sample number of 32 was obtained for each arm making a total of 64 participating students. We used non-probabilistic sampling by quotas, thus, by dividing the population by our sample (64 students) we find a ratio of 5.32, a figure by which the number of students of each academic year was divided.

Variables

The diet type was considered according to the fats consumption, carbohydrates, milk and it derivatives all these elements were measured by the frequency of food consumption with the respective content.

The anxiety was measured with the Beck´s anxiety inventory (BAI). The nutritional state was evaluated through the application of the Body Mass Index formula (BMI), to measure the weight a calibrated balance was employed, to measure the size was employed the portable stadiometer. The consumption of vitamin B supplement was determined according to the antecedent or the presence of vitamin B consumption in any of its presentations by means of the food consumption frequency questionnaire.

For the acne variable were considers the inflammatory and the non-inflammatory lesions, the characteristics lesion of the Rosacea (erythema, telangiectasia, papule and pustule) and the acne special forms to include: Conglobata, fulminant, late, associated with medication consumption, all of them diagnosed after the clinical examination by the specialist.

Data-collection instruments

A database was built with the information obtained in the collection of the information. A primary source of information collection was used with the survey technique and the questionnaire as an instrument that was coded. After submitting the data - collection Instrument to expert judgment, of a total of 8 specialists in the field of our variables, this obtained an average validity of 87.31%. Posteriorly a pilot test was realized on 20 participants (10 cases and 10 controls) in a population similar to the one we intended to study, the following reliability values (Cronbach's alpha) it was achieved to obtain

thanks to UNHEVAL SPSS statistic software: Type Diet / Consumption of B vitamin: Cases: 0.97, Controls: 0.95; Anxiety: Cases: 0.88, Controls: 0.75; Socioeconomic Stratum: Cases: 0.83, Controls: 0.72.

Statistical Analysis

A descriptive analysis of the information was carried out through frequencies, percentages, measures of central tendency (mean, median, mode), measures of dispersion (range, standard deviation, variance). For the association between parametric quantitative variable and acne, Student's t-test was used and the association between qualitative variables and acne was performed with chi-square. A p value <0.05 was considered for a significant difference 95% confidence interval. The statistical software SPSS was used.

Ethical aspects

This research preserved the confidentiality of the data obtained in accordance with the principles of justice, autonomy, beneficence and non-maleficence described in the informed consent and approved by the participants. In addition, it complies with the norms of the Declaration of Helsinki - Seoul 2008, the Declaration of Bioethics and Human Rights UNESCO 2005, the Law that establishes the rights of users of health services Law 29414 (0ct. 2009) and the Law on protection of personal data, Law 29733 (July 2011); It was reviewed and approved by the Ethics Commission of the Hermilio Valdizán National University from Huanuco

Results

En la tabla 1 se presentan las características sociodemográficas de la investigación, se aprecia que la media de la edad en los alumnos fue de 22,31 + 3,22 años, fueron más varones que mujeres con 51,60% y 48,40%, respectivamente. La herencia biológica se presentó en más de la mitad de los participantes, el estrato socioeconómico predominante fue el bajo con 84,40% y la mayoría no consume suplemento vitamínico B. En la tabla 2 se muestran las características clínicas de los encuestados, el Índice de Masa Corporal (IMC) que predominó en los alumnos fue el Normal, la ansiedad mínima – leve fue superior que la moderada – grave.

Table 1. Sociodemographic characteristics in students from 1st to 5th year of Human Medicine of UNHEVAL in 2018

Variable	Frequency	Percentage
Age (X ± DS)	22,31 ± 3,22	
Gender		
Female	31	48,40
Male	33	51,60
Biological Inheritance		
No	28	43,80
Yes	36	56,30
¿Who?		
Mother	9	14,10
Father	9	14,10
Mother and Father	5	7,80
Socioeconomic Stratum		
High	2	3,10
Medium	8	12,50
Low	54	84,40
Diet Type		
Milk and derivates		
Not Consumption	46	71,90
Infrecuent Consumption	17	26,60
Frecuent Consumption	1	1,60
Eggs, meat and fish		
Not Consumption	40	62,50
Infrecuent Consumption	23	35,90
Frecuent Consumption	1	1,60
Greens and vegetables		
Not Consumption	11	17,20
Infrecuent Consumption	48	75,00
Frecuent Consumption	5	7,8
Fruits		
Not Consumption	19	29,70
Infrecuent Consumption	37	57,80
Frecuent Consumption	8	12,50
Pulses and cereals		
Not Consumption	8	12,50
Infrecuent Consumption	52	81,30
Frecuent Consumption	4	6,30
Oils and Fats		
Not Consumption	57	89,10
Infrecuent Consumption	6	9,40
Frecuent Consumption	1	1,60
Pastries and bakery		
Not Consumption	34	53,10
Infrecuent Consumption	30	46,90
Frecuent Consumption	0	0,00
Miscellaneous		
Not Consumption	34	53,10
Infrecuent Consumption	28	43,80
Frecuent Consumption	2	3,10
Drinks		
Not Consumption	52	81,30
Infrecuent Consumption	12	18,80
Frecuent Consumption	0	0,00
Consumption of vitamin B supplement		
No	51	79,7
Yes	13	20,3

Table 2. Clinical characteristics in students from 1st to 5th year of Human Medicine of UNHEVAL in 2018

Characteristic / Variable	Frequency	Percentage
BMI*		
Low	1	1,60
Normal	42	65,60
High	21	32,80
Anxiety		
Minimum - Mild	44	68,80
Moderate - Severe	20	31,30
Acné		
No	32	50,00
Yes	32	50,00

*: Body Mass Index

The table 3 details the bivariate inferential analysis among the variables. Causal association was found with the consumption of Fruits and with the biological inheritance, no significance was found in the other items of the Type of diet. The anxiety data support to the available literature but does not reach significant values. The nutritional status was also not significant, as were the other intervening variables.

Table 3. Bivariate inferential analysis in Acne in students from 1st to 5th year of Human Medicine of UNHEVAL in 2018

Characteristic / Variable	Acné				p	OR	IC 95% OR / RR / RP	
	No (0)		Yes(1)					
	Number	%	Number	%			Low ;	Upp
Diet type								
Milk and derivates					0,56	1,15		
Not Consumption	24	52,20	22	47,80				
Infrecuent Consumption	8	47,20	9	52,90				
Frecuent Consumption	0	0,00	1	100,00				
Eggs, meat and fish					0,13	4,03		
Not Consumption	17	42,50	23	57,50				
Infrecuent Consumption	15	65,20	8	34,80				
Frecuent Consumption	0	0,00	1	100,00				
Greens and vegetables					0,87	0,29		
Not Consumption	6	54,50	5	45,50				
Infrecuent Consumption	24	50,00	24	50,00				
Frecuent Consumption	2	40,00	3	60,00				
Fruits					0,04	6,09		
Not Consumption	5	26,30	14	73,70				
Infrecuent Consumption	22	59,50	15	40,50				
Frecuent Consumption	5	62,50	3	37,50				
Pulses and cereals					0,41	1,81		
Not Consumption	3	37,50	5	62,50				
Infrecuent Consumption	28	53,80	24	46,20				
Frecuent Consumption	1	25,00	3	75,00				
Oils and Fats					0,43	1,68		
Not Consumption	29	50,90	28	49,1				
Infrecuent Consumption	2	33,30	4	66,70				
Frecuent Consumption	1	100,00	0	0,00				
Pastries and bakery					0,13	0,47	1,27	0,17
Not Consumption	14	41,20	20	58,80				
Infrecuent Consumption	18	60,00	12	40,00				
Frecuent Consumption	0	0,00	0	0,00				
Miscellaneous					0,34	2,14		
Not Consumption	17	50,00	17	50,00				
Infrecuent Consumption	15	53,60	13	46,40				
Frecuent Consumption	0	0,00	2	100,00				
Drinks					0,52	0,66	2,36	0,19
Not Consumption	25	48,10	27	51,90				
Infrecuent Consumption	7	58,30	5	41,70				
Frecuent Consumption	0	0,00	0	0,00				
Anxiety					0,59	1,34	3,87	0,46
Minimum - Mild	23	52,30	21	47,70				
Moderate - Severe	9	45,00	11	55,00				
BMI*					0,57	1,14		
Low	1	100,00	0	0,00				
Normal	20	47,60	22	52,40				
High	11	52,40	10	47,60				
Consumption of vitamin B supplement					0,35	0,56	1,93	0,16
No	24	47,10	27	52,90				
Yes	8	61,50	5	38,50				
Age (X ± DS)	22,88 ± 3,55		21,75 ± 2,81		0,16$	1,12	2,72	´-0,47
Gender					0,80	0,88	2,35	0,33
Female	15	48,40	16	51,60				
Male	17	51,50	16	48,50				
Biological Inheritance					0,01	3,74	10,61	1,31
No	19	67,90	9	32,10				
Yes	13	36,10	23	63,90				
¿Who?					0,03	7,33		
Mother	6	66,70	3	33,30				
Father	2	22,20	7	77,80				
Mother and Father	0	0,00	5	100,00				
Socioeconomic Stratum					1,00	0,00		
High	1	50,00	1	50,00				
Medium	4	50,00	4	50,00				
Low	27	50,00	27	50,00				

*:Body Mass Index
$:Student's t-test

Discussion

We found that the type of diet is not causally related to the presence of acne, with exception to the fruit item it if is related. Juhl et al., did not find any observational or genetic association between milk consumption and acne in their adult population (12), and like us, Mariana et al., concluded that the increased weekly consumption of fruits may have a protective effect on the development or severity of acne (13). A research in Poland found that the daily consumption of milk and it derivatives appeared to be weakly associated with the acne (14). In Denmark it was found that the daily consumption of milk and derivatives was associated with a higher OR for the acne compared who did not consume (15), similarly, another research found that people with moderate / severe acne consumed more carbohydrates (6). A research also conducted in Poland concluded that adult acne is associated with the western diet (17). The degree of lactase activity and the type of dairy consumed by the participants could play a role in the difference in results (12). The differences between dietary intake, biological factors associated with acne and specific acne quality of life scores between the groups can difficult the interpretation of clinical relevance (16).

The anxiety was not positively related to the presence of acne, however, different studies have shown association. In Lithuania, for example, they concluded that more than half of the acne patients who participated in the research had comorbid emotional disorders and the anxiety was the most prevalent sign, 1.7 times more frequent than depression (18). Similarly, Salman et al., found that the facial acne causes increased levels of social anxiety, depression and deterioration in the quality of life (19). Nguyen found that the acne causes an increase in the anxiety and depression in its study population (20). The discrepancy is explained by the different psychosocial approaches that arise as the person's age progresses.

The nutritional status to was evaluated employing the Body Mass Index (BMI) is not related to the presence of acne. In contrast, Lu et al., concluded that BMI is negatively associated with the number of acne lesions in Taiwanese women with moderate to severe acne (21). Contrary, La Rosa shows that no significant differences were found for BMI (22), as was showed in a Paraguayan research, where the BMI was not related to the presence and / or severity of acne (23). The difference could be due to the existence of other factors, such as hormones, diet and stress, these factors could influence in the relationship of BMI and acne (21). Therefore, the Body Mass Index that indicates the participant's nutritional status not is associated with the presence of acne in the research.

The consumption of vitamin B supplements is not related to the presence of acne. In Canada they found that an amide form of Vitamin B3 is beneficial in a variety of skin conditions such as acne (24), similar to that shown by Veraldi where they suggest that the vitamin B12 has a pathogenic role in the development of acneiform rashes (25). Kang et al., discovered that the Vitamin B12 modulates the transcriptional activities of skin bacteria and has an essential role in the development of the disease (26), while Brescoll and Daveluy indicate that cutaneous complications of a cobalamin treatment included acne (27). These dissimilar results could result from altered cobalamin levels, both deficiency and excess, can lead to dermatological manifestations. Additionally, the multiple administration of the vitamin group B can have diverse effects since some of its components can contribute to acne and others have chemo preventive and immunological properties (24).

The biological inheritance presents a positive association with the presence of acne. In Brazil, a significant association was demonstrated between the presence of vulgaris acne (VA) and the family history of this disease, whose prevalence was to 72.9% in contrast to the group without VA, which was 27.2% (27). A Romanian research concluded that the family history of acne (mother or father) could be considered as risk factors in vulgaris acne (13). Wolkenstein et al., demonstrated that the biological inheritance (mother, father and brothers) was the main risk factor for the development of acne (29). This relationship is explained by the transmission of genetic information from parents to children for to exist the acne, especially on the maternal side (13).

Conclusion

The frequent consumption of fruits seems to act as a protective factor for the development of acne. Additionally, the biological inheritance is

positively associated with the development of acne, mainly from the paternal side.

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