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The Correlation Between Stress Levels and Acne Vulgaris Stage in 2016th Students Faculty of Medicine Universitas Airlangga Surabaya

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ABSTRACT

Introduction: Acne vulgaris is a common cutaneous inflammatory disorder affecting more than 85% of adolescents worldwide. More than quarter of medical students 2016th had suffers from acne and complaint stress. The stress levels could increase because lot of burden in academy assessment, and other factors that can induced stress like psychosocial psychological stress and triggers by other factors. Stresss levels measured by PSS questionnaire there is mild (≤ 13), moderate (14-26) and severe (>27). Although there is widespread acceptance of a relationship between stress and acne flares, not many studies have been conducted to assess this relationship. Therefore this research encourage, does the stress affect with the severity appearances of acne. **Objectives**: To correlate stress levels to acne vulgaris stage among students of Faculty of Medicine Universitas Airlangga. **Methods:** This research design used correlative analysis with cross sectional aproach and total sampling of all students medical students 2016th with the exclusion of students who are using corticosteroid, psychotherapy drugs and non acne vulgaris by staging the acne vulgaris using GAGS and stress level using PSS (perceived stress scale) questionnaires that relate to the research. Also taking pictures for assure the stage of respondent who suffers acne vulgaris, measure and correlate with spearmen correlation. **Results:** The total of subjects 69 students constituted the study population. This study was attended by 60 male 27,6% of the total number of respondents and 157 female 72,4%. There is 69 people who suffered from acne consist of 46 peoples 66,67% had mild acne stage, 17 peoples 24,63% had moderate acne stage and 6 peoples 8,7% had severe acne stage. The risk factor that mostly induced acne vulgaris stage were final exam (91.3%), eating habbit(87%), and premenstruation acne(71%). The correlation between stress levels and acne vulgaris stage shows .521 using SPSS program. **Conclusion**: There is significant correlation that the stress levels effect to the skin apearrance and stage of acne vulgaris, also the others factors have been asked on the questionnaire could be increase the acne become more aggressive growth on skin.

Keywords: acne vulgaris stage; medical students; stress levels

INTRODUCTION

Background

Acne or acne vulgaris, commonly called acne, is a chronic obstructive and inflammatory skin disease in pilosebasea(1). Acne predilection places are on the face, shoulders, chest, back, neck, and arms(2). Study in the dermatology department of medical faculty in North Carolina, USA in 2007 with a sample of 14-15 year old high school students in Singapore, mentioned in high stress conditions a significant acne attack was 95% in male students and 92% in female students(3).

In Indonesia about 95-100% of men and 83-85% of women who is in 16-17 years suffer from acne. The prevalence of acne in adult females is about 12% and in adult males 3%. In another study found that acne is a skin problem through adolescence with a higher prevalence of women than men in the age range of 20 years or more(4).

The effect of acnes may add to the emotional and psychological challenges experienced during adolescence period, and it can lead to the developmental issues of body image, socialization, and sexuality. Psychological issues such as dissatisfaction with appearance, embarrassment, self-consciousness, lack of self-confidence, and social dysfunction such as reduced/avoidance of social interactions with peers and opposite gender, reduced employment opportunities have been documented. Moreover, anxiety and depression, even suicidal ideation are also found. Assurance and counseling along with early treatment of acne vulgaris is important to reduce disease-related psychosocial sequelae and increase the efficacy of treatment.

In this study, it is important to know whether the psychic of the medical students can affect the stress levels and the severity appearances of acne vulgaris on the skin And to find out whether there is a relationship, the higher level of stress will induced and affect of the more severe acne appears, especially in medical students. The appearance of acne vulgaris could raise complications or effects, those are comedonal acne, papulo-pustular acne, conglobata acne, cyst acne, red scars and other severe acne lesions[5]. Acne sufferers also caused from higher production of androgen hormon levels and higher sebum levels than normal people, eventhough androgen hormon levels of acne sufferers are still within normal limits it still could lead to the appearances of acne vulgaris[1].

For the medical students, stress represents an important challenge, especially during the first year of medical school, caused by the absence of a learning strategy, the sleepless night before the exam and also an unhealthy food intake during the exams[6].

A causative link between emotional stress and acne has long been postulated. There is mounting evidence that the molecular mechanism underlying this observation is related to the expression of receptors for several neuroendocrine mediators by the sebaceous gland. Stress can induce acne with a mechanism of elevation of glucocorticoids and adrenal androgens. Both hormones are released during periods of emotional stress and are known to aggravate acne, and may induce sebaceous hyperplasia. Corticotropin releazing hormone (CRH), the coordinator of the stress response in the human body, is also found to increase sebaceous lipogenesis and also increases the change of sebocytes from androgen precursors to testosterone[7].

Based on the background that has been described, I was interested to examine the extent to which "Relationship stress levels with acne vulgaris stage on 2016th students faculty of medicine Universitas Airlangga".

Purpose

To analyze the corelation of stress levels with complaints of acne vulgaris stage among students of Faculty of Medicine Universitas Airlangga.

METHODS

This was an observational analytic research with cross sectional design. The research was conducted on July 2019 – February 2020 in the Faculty of Medicine Universitas Airlangga. The population of this study was medical students of Faculty of Medicine Universitas Airlangga year 2016. The sample was collected using total sampling technique. All students medical students year 2016 were included with the exclusion of students who are using corticosteroid, psychotherapy drugs and non acne vulgaris. The independent variable was stress which was measured by Perceived Stress Scale (PSS), consisting of 10 items where each item was valued 0-4. The total score was 0-40. Stress level was divided into three groups : mild (≤ 13), moderate (14-26), and severe (27-40). The dependent variable was acne vulgaris. The diagnosis of acne vulgaris was made by taking photos of skin disorders in the form of blackheads, papules, pustules, and nodules in the predilection area and grouped into three stage which were mild, moderate and severe. The acne staging was using GAGS score. Data analysis used univariate analysis and bivariate analysis with Kendall Tau correlation test. The ethical consideration was based on (1) inform consent, where the informed consent sheet was given before the respondents were enrolled in this study, (2) anonymity, where the respondents weren't need to write their name on the questionnaire, (3) confidentiality, where the researcher keep all the data safely and guarantee its confidentiality.

RESULTS

Demographic of Research Subjects

This research was carried out in the Faculty of Medicine of Universitas Airlangga on medical students batch 2016th . In this study, there were 223 respondents were recruited in the criteria, then we found 6 people were excluded bacause of using medication such as routine corticosteroids and taking psychoteraphy drugs such as lithium and alprazolam that induced the appearance of acne and the final results were 217 of medical students who were enrolled. The respondents who did not suffered from acne vulgaris were excluded.

Table 1. Individual characteristic based on age, gender, acne's problem

Individual characteristic	n (%)	Total
Age		
19 years old	3(1.3%)	217
20 years old	162(74.7%)	
21 years old	52(24%)	
Gender		
Male	60(27.6%)	217
Female	157 (72.4%)	
Student with acne		
Male	18 (26.1%)	69
Female	51 (73.9%)	

Most of the respondents were female (72.4%) and aged 20 years old (74.7%).

Perceived Stress Scale of Research Subject

Table 2. Perceived stress scale in all respondent

Perceived stress scale	Acne
Mild	0 (0%)
Moderate	63 (91.3%)
Severe	6 (8.7%)

Most of the respondents who suffered from acne vulgaris had moderate stress levels as many as 63 peoples (91.3%).

Acne Vulgaris Stage of Research Subject

Table 3. Acne stage in all respondent

Acne Stage	Total (%)
Mild	46 (66.67%)
Moderate	17 (24.63%)
Severe	6 (8.7%)

The most acne stage of the respondents was mild with 46 (66,67%) respondents.

Risk Factors of Acne Appearance on Research Subject

Table 4. Risk factors of acne appearance of research subject

Risk Factors	n (%)	Total
Academic stress		
Final Exam		
- Yes	63 (91.3%)	
- No	6 (8.7%)	
Plenary Session		69
- Yes	3 (4.3%)	
- No	66 (95.7%)	
Skill Exam		
- Yes	37 (53.6%)	
- No	32 (46.4%)	
Using Cosmetics		
1. Yes	48 (69.6%)	69
2. No	21 (30.4%)	
Skin Protector		
1. Yes	37 (54.6%)	69
2. No	32 (46.4%)	
Popping Pimples		
1. Yes	33 (47.8%)	69
2. No	36 (52.2%)	
Consume cigarette		
1. Yes, Often	7 (10.1%)	69
2. No	62 (89.9%)	
Alcohol		
1. Yes, Often	6 (8.7%)	69
2. No	63 (91.3%)	
Eating habit		
1. Yes	60 (87%)	
- High sugar	24	
- High fat	32	69
- Nut	7	
- Chocolate	28	
2. No	9 (13%)	
Premenstruation Acne		
1. Yes	49 (71%)	69
2. No	20 (29%)	

From the data we know that most of the students had their acne during the final exam as many as 63 (91.3%). There were 48 (69.6%) respondents used cosmetics and 37 (54.6%) used sunblock or skin protector. The habit of squeezing pimple was in 33 (47.8%) respondents. Smoking and alcohol consumption were only in 7 (10.1%) and 6 (8.7%), respectively. The habit of eating sweet foods, nuts, chocolate, and oily food were found in 60 (87%) respondents. In addition, premenstruation acne was found in 71% of respondents.

Analysis for Correlation Between Stress Levels and Acne Vulgaris Stage on Medical Students

Table 5. Cross tabulation for stress levels and acne stage

n = 69		Mild	Moderate	Severe
PSS		46 (66,67%) :	17(24,63%) :	6 (8,7%) :
Acne	Moderate	45 (97,83%)	16 (94,12%)	2 (33,33%)
	Severe	1 (2,17%)	1 (5,88%)	4 (66,67%)

Table 6. Analysis for correlation between stress levels and acne stage based on mild moderate, and severe stage

n = 69	Perceived Stress Scale	
	Correlation Coefficient[1]	Sig. (2-tailed)
Acne Stage	.406**[2]	.001

[1]Correlation Coefficient was in regards of Kendall's tau_b Correlation Test

[2]**.Correlation is significant at the 0.01 level (2-tailed)

Most of the respondents who had mild stress were having moderate acne as many as 45 people, and most of the respondents who had severe stress developed severe acne as many as 4 people. From the table above it can be concluded that the higher the degree of stress cause the higher degree of severity of acne vulgaris.

Based on the analytic, we can conclude that there was a significant correlation between stress level and the stage of acne vulgaris with $p=0.001$ ($p<0.005$). The correlation coefficient showed 0.406, so we can conclude that there was a positive and moderate correlation between the two variables.

DISCUSSION

Stress is a common problem that occurs in human life. Stress refers to the consequences of an organism's failure to respond adequately to mental, emotional, or physical demands, actual or imagined[(8)]. By using the questionnaire Perceived Stress Scale we can provide stress levels into mild, moderate and severe. The acne vulgaris sufferers found out with start on moderate and severe stress levels.

Related the Stress Levels it's moderate corelation it is shows that the respondents acne with severe stage had higher stress levels. Also on the correlation focusing on only acne sufferers shows that the correlation specific based on the staging mild moderate severe shows 0.521 that means moderate correlation coefficient. Some of the journal on Saudi Medical Journal, 2018 it is significant that stress induced the appearance of acne. Being a medical student is a well-known risk factor for stress. Overall prevalence of stress among medical students in Saudi Arabia was 63.7% and severe stress was 25%,8 while the prevalence of stress was 31.2% in the United Kingdom, 29.6%-46.2% in Malaysia, 57% in Singapore, and 61.4% in Thailand. A prospective cohort study, published in 2003, which comprised 22 university students, showed increased acne severity during stressful exam periods by using previously validated scales measuring acne severity and perceived stress.

Activation of neurohormones by psychological stress occurs largely via the hypothalamic–pituitary–adrenal (HPA) axis, with subsequent upregulation of key stress hormones, such as corticotropin-releasing hormone (CRH), ACTH, and glucocorticoids. Neurohormonal responses to stress also include an activation of the sympathetic nervous system with a subsequent increase of catecholamines, a phenomenon that has received much less attention than the stress-triggered activation of the HPA axis[(9)].

Upon perception of psychological stress, the central stress response leads to the activation of the hypothalamic–pituitary–adrenal axis, which causes the release of corticotropin-releasing hormone (CRH), ACTH, and prolactin (PRL). Further, an upregulation of substance P (SP) and calcitonin gene-related peptide (CGRP) can be observed in the dorsal root ganglia. Such stress response patterns may be translated into a skin stress response, including the local production of CRH, ACTH, and glucocorticoids (GCs), the release of inflammatory cytokines, and the sprouting of SP+ nerve fibers. In the skin response to stress, mast cells occupy a central switchboard position, as they are targets for stress-triggered factors as well as effector cells that contribute, for example, to neurogenic inflammation in the skin. Environmental factors are also capable of inducing a skin stress response, and this may be signaled to the brain, where it affects behavior and leads to an increased vulnerability to additional stress perception. NGF, nerve growth factor[(10)]. This is consistent with the results of research Yosipovitch et.al on students in Singapore about stress can cause exacerbation of acne vulgaris and also increase free fatty acids in the face[(3)].

Limitation of this study is the cross sectional type of research. Besides the variables that influence the level of stress with the onset of acne reported are based on the results of the questionnaire only, so there are respondents who fill not in accordance with reality giving rise to bias in this study. In addition there are also external variables that cannot be controlled, such as parental status, student personality type, place of residence, interpersonal problems, parental problems, and so on that can affect a person's stress level.

CONCLUSION

There wass a significant correlation between stress levels and the severity stage of acne vulgaris. Medical students who have severe stress were more likely to have severe acne. There are several factors such as final exam in the category of academic stress, eating habit like oily food and high sugar food also premenstruation had been induced the appearance of acne. Further development of this research in detail is needed, especially for the respondents to be more able to distinguish in terms of the factors where the appearance of acne start.

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