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The Relationship Between The Menstrual Cycle and The Incidence of Acne Vulgaris in Female Students at The Faculty of Medicine, Baiturrahmah University Padang Class of 2022

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Abstract

Acne vulgaris is a disease that attacks the pilosebaceous unit and can cause non-inflammatory and inflammatory lesions, as well as varying degrees of scarring. In Southeast Asia, the prevalence of acne vulgaris reaches 40-80% of cases. The exact etiology and risk factors for the development of acne vulgaris remain uncertain. However, one factor that is thought to play a role is the fluctuation in estrogen and progesterone that occur during the menstrual cycle in women. This study aimed to determine the relationship between the menstrual cycle and the incidence of acne vulgaris in student at the faculty of medicine, Baiturrahmah University, Padang, class of 2022. The type of research is observational analytics, consist of 48 samples using a consecutive sampling technique. Univariate data analysis is presented and bivariate analysis using the chi-square test. Data processing using the computerized SPSS version 25.0. The highest incidence of acne vulgaris was 75.0% and the highest menstrual cycle was normal was 64.6%. There is relationship between menstrual cycle disorders and the incidence of acne vulgaris (p=0.015) and none the relationship between abnormal menstrual cycles and the incidence of acne vulgaris (p=1.000). There is relationship between menstrual cycle disorders and the incidence of acne vulgaris and there is no relationship between abnormal menstrual cycles and the incidence of acne vulgaris instudent at the Faculty of Medicine, Baiturrahmah University, Padang, Class of 2022.

Keywords: Acne Vulgaris, Menstrual Cycle, Female Students

1. Introduction

Acne vulgaris (AV) is a chronic, multifactorial skin disease characterized by inflammation of the pilosebaceous units such as comedones, papules, pustules, nodes and cysts with a predilection for the face, neck, shoulders, chest, back and upper arms. Acne vulgaris is a common skin disease and affects almost 80%-100% of the human population.[1]

Global Burden of Disease (GBD) stated that acne vulgaris affects 85% of young adults aged 12–25 years throughout the world. In Southeast Asia, the prevalence of acne vulgaris reaches 40-80% of cases. Meanwhile, according to records from Indonesian cosmetic dermatology, the incidence of acne vulgaris continues to increase from year to year.[2]

The factors causing acne vulgaris are very diverse (multifactorial) but are still not known for certain. Several etiologies of acne vulgaris that are thought to play an important role include sebum hypersecretion, hyperkeratinization, propionibacterium acnes colonization and inflammation.[3] A number of other factors are thought to play a role in the emergence of acne vulgaris, including hormones, diet, cosmetics, stress and unhealthy sleeping habits.[2,3] Apart from these factors, menstruation is one of the causes of someone experiencing acne vulgaris.[4]

Menstruation is periodic bleeding from the uterus due to the shedding of the endometrial lining of the uterus which is routinely experienced every month by normal women.[5] The menstrual cycle refers to

changes in the activity of the ovaries and endometrium which also play a role in the reproductive process.[5]

In adolescence, acne is usually caused by an increase in sex hormones, especially androgen hormones which increase during puberty. Increased hormone concentrations before menstruation can predispose to exacerbations and worsen acne vulgaris. For a long time, the hormone progesterone was responsible for stimulating the activity of the sebaceous glands in women. Subsequent studies showed that physiological levels of exogenous progesterone did not stimulate the sebaceous glands in prepubescent boys and girls.[6]

Irregular menstrual cycles are also caused by an imbalance of the hormones estrogen and progesterone. The hormones estrogen and progesterone trigger the appearance of acne vulgaris before menstruation. Increased sebaceous gland activity during menstruation is related to low levels of the hormone estrogen just before and during menstruation. This causes an increase in acne vulgaris during or before menstruation in most women. Therefore, there are three phases, namely the premenstrual phase, menstrual phase and postmenstrual phase.[4,6,7]

The results of research conducted by Soetama and Indira in 2020 found that acne vulgaris sufferers were dominated by women, namely 63.9%. The age group most suffering from acne vulgaris is 16 years (53.3%). Most patients suffering from acne vulgaris always clean their faces twice a day (65.5%).[7] Marcella's research results in 2023 found that there was a relationship between the menstrual phase and worsening of acne vulgaris, and 63.3% of respondents stated that acne vulgaris worsened during the menstrual phase.[8] The results of Elmiyati and Fadhil's research in 2019 found that there was a relationship between the time of menstruation and the incidence of acne with a bivariate chi square analysis of p= .005 ($p<0.05$).[9]

The results of Widyawati et al.'s research in 2019 found that there was a significant relationship between the menstrual phase and the degree of acne vulgaris and there was a difference in the average of premenstrual and postmenstrual inflammatory lesions.[10] Different results found in Bahdar's 2020 research showed that there was no significant relationship between menstrual cycle abnormalities and the incidence of acne vulgaris in UII medical faculty students.[6]

Based on the above, the author is interested in conducting research entitled "The relationship between the menstrual cycle and the incidence of acne vulgaris in female students at the Faculty of Medicine, Baiturrahmah University, Padang class of 2022".

2. Methods

This research is within the scope of the Skin and Venereology Field. This research will be carried out at the Faculty of Medicine, Baiturrahmah University, Padang in July 2023 until completion. This type of research is observational analytic with a cross sectional design approach. The target population in this research was students from the Faculty of Medicine, Baiturrahmah University, Padang. The population covered in this study were students from the Faculty of Medicine, Baiturrahmah University, Padang, class of 2022. The sampling method used in this study used a consecutive sampling technique, namely a technique with how to select samples that meet the research criteria for a certain period of time so that the sample size is met with 48 samples. The independent variable (independent variable) in this study is the menstrual cycle and the dependent variable (dependent variable) in this study is

the incidence of acne vulgaris. The tools used in this research were consent forms, subject data forms and questionnaires to determine the relationship between the menstrual cycle and the incidence of acne vulgaris. Data analysis uses the chi-square test with a confidence level of 95% (α = 0.05) if the p value < 0.05 then it shows that there is a significant relationship between the two variables.

3. Results

Table 1. Frequency distribution of acne vulgaris

Occurrence of Acne Vulgaris	*f*	%
No	12	25.0
Yes	36	75.0
Total	**48**	**100.0**

Based on table 1, it can be concluded that of the 48 respondents, it is known that the respondents who experienced acne vulgaris the most were 36 people (75.0%). There were 12 respondents who did not experience acne vulgaris (25.0%).

Table 2. Frequency distribution of menstrual cycles

Menstrual Cycle	*f*	%
Normal	31	64.6
Oligomenorrhea	13	27.1
Polymenorrhea	4	8.3
Total	**48**	**100.0**

Based on table 2, it can be concluded that of the 48 respondents, the majority had a normal menstrual cycle, namely 31 people (64.6%). There were 13 respondents with oligomenorrhea menstrual cycles (27.1%), while there were 4 respondents with polymenorrhoea menstrual cycles (8.3%).

Based on table 3. it can be concluded that from of the 31 respondents with normal menstrual cycles, 27 respondents (56.3%) experienced acne vulgaris, while the other 4 (8.3%) did not experience acne vulgaris. Of the 17 respondents with abnormal menstrual cycles, 9 respondents (18.8%) experienced acne vulgaris, while the other 8 (16.7) did not experience acne vulgaris. Test resultsstatistics using the Fisher exact test obtained a p value = 0.015. The p value is smaller than the significant value or sig. (2-tailed) which is 0.05, which means there isthe relationship between menstrual cycle disorders and the incidence of acne vulgaris instudent at the Faculty of Medicine, Baiturrahmah University, Padang, Class of 2022.

Table 3. The relationship between the menstrual cycle and the incidence of acne vulgaris

Menstrual Cycle	Occurrence of Acne Vulgaris						P value
	No		Yes		Amount		
	f	%	*f*	%	*f*	%	
Normal	4	8.3	27	56.3	31	64.6	
Abnormal	8	16.7	9	18.8	17	35.4	0.015
Total	**12**	**25.0**	**36**	**75.0**	**48**	**100.0**	

Table 4. Connection of abnormal menstrual cycle on the occurrence of acne vulgaris in student at the Faculty of Medicine, Baiturrahmah University, Padang, Class of 2022

Menstrual Cycle	Occurrence of Acne Vulgaris						P value
	No		Yes		Amount		
	f	%	*f*	%	*f*	%	
Oligomenorrhea	6	35.3	7	41.2	13	76.5	
Polymenorrhea	2	11.8	2	11.8	4	23.5	1,000
Total	**8**	**47.1**	**9**	**52.9**	**17**	**100.0**	

Based on table 4, it can be concluded that of the 13 respondents who experienced oligomenorrhea menstrual cycles, 7 respondents (41.2%) experienced acne vulgaris, while the other 6 (35.3%) did not experience acne vulgaris. Of the 4 respondents who experienced polymenorrhea menstrual cycles, 2 respondents (11.8) experienced acne vulgaris, while the other 2 (11.8) did not experience acne vulgaris. Test results statistics using the Fisher exact test obtained a p value = 1,000. The p value is greater than the significant value or sig. (2-tailed) which is 0.05, which

means there is nothe relationship between abnormal menstrual cycles and the incidence of acne vulgaris instudent at the Faculty of Medicine, Baiturrahmah University, Padang, Class of 2022.

4. Discussion

4.1 The Incidence of Acne Vulgaris in Student at The Faculty of Medicine, Baiturrahmah University, Padang Class of 2022

Based on research results from 48 respondents, the most people experienced acne vulgaris, namely 36 people (75.0%) instudent at the Faculty of Medicine, Baiturrahmah University, Padang, Class of 2022.

Previous research conducted by Safitri in 2021 regarding the incidence of acne vulgaris in final year students at the Faculty of Medicine, Muhammadiyah University of Surakarta, the class of 2017, it was found that the most people experienced acne vulgaris (78.6%) and Aziz's research in 2022 on students of the class of 2021 at the Faculty of Medicine, Batam University, it was found that (59.5%) of the respondents experienced it. acne vulgaris.[3,11]

This situation can occur because there are many factors (multifactor) that cause acne vulgaris. Several factors can trigger acne vulgaris such as family history (genetics), use of cosmetics, work, stress, use of drugs, onset of menarche, menstrual cycle, lifestyle and eating patterns.[12]

Acne vulgaris is a disease that does not affect general health status, but can become a big and important problem due to its existence in human social life, where human skin (especially the face) is considered to have an important role in terms of body perception. Although acne vulgaris is a disease of the pilosebaceous unit, it does not develop from the sebaceous glands, but rather in the central part of the sebaceous follicle canals. There are many sebaceous glands on the face, scalp, chest and back. In adults, most facial hair follicles predispose to acne vulgaris along with sebaceous glands.[6]

The findings of students at Faculty of Medicine, Baiturahmah University, who experienced acne vulgaris could be caused by hormones such as androgens, estrogen and progesterone. In theory in women, acne vulgaris is sometimes related to hormonal changes during the menstrual cycle. Apart from that, the influence of consuming lots of fatty snacks such as fried foods, cheese, milk, nuts and others as raw materials for the formation of androgen hormones.[13]

The impact of acne vulgaris if the respondent suffers from it for too long is a reduction in self-confidence. Even though acne vulgaris is often considered an ordinary problem by society, it has quite a big impact on a person's life, especially teenagers who are starting to care about the appearance of their bodies. This was also stated by Fithriyana (2019), that the appearance of acne becomes an awareness of the importance of one's appearance in the social environment which will influence self-concept. Those who suffer from acne vulgaris will become insecure, afraid of being bullied, anxious, depressed and even isolating themselves because they don't want their faces to be seen by other people.[14]

4.2 Menstrual Cycle on Student at the Faculty of Medicine, Baiturrahmah University, Padang Class of 2022

Based on research results from 48 respondents, the majority with normal menstrual cycles were 31 people (64.6%). Student at the Faculty of Medicine, Baiturrahmah University, Padang, Class of 2022.

The research results are in line with those previously conducted by Nainggolan in 2021 In female students at the Faculty of Medicine, University of North Sumatra, the

most menstrual cycles were normal, namely (86.2%) and Laura's 2023 research on Tarumanegara medical students found that the most menstrual cycles were normal, namely (63.4%) but it is different from Purnama's research in 2022 Final Year Students Who Experienced Stress at Dr. Soepraoen Hospital Malang, research results showed that the majority of students had abnormal menstrual cycles, namely (56.7%).[15, 16]

The normal menstrual process is the result of interactions between the hypothalamus, pituitary and ovaries with changes in target tissues in the normal reproductive tract. The ovaries play an important role in this process because they appear to be responsible for regulating cyclic changes and the length of the menstrual cycle.[9]

A normal menstrual cycle indicates normal hormonal activity, having a normal menstrual cycle indicates a healthy hypothalamic-pituitary axis with a normal uterus. However, certain conditions such as sudden weight loss, excessive exercise, medical conditions, and even stress can interfere with a woman's ability to have a normal menstrual cycle.[15]

However, a small number of students experience abnormal menstrual cycles, one of the reasons for this is experiencing stress because when stressed, a person's body will release adrenaline as a form of defense. Stress or emotions are part of the hormonal cycle feedback system in the human body. Increased levels of cortisol in the blood can affect menstruation and can even trigger menstrual disorders in women.[16]

4.3 The Relationship Between The Menstrual Cycle and The Incidence of Acne Vulgaris

Based on the research results, it shows that there is a relationship between the menstrual cycle and the incidence of acne vulgaris instudent at the Faculty of Medicine, Baiturrahmah University, Padang, Class of 2022.

The results of this study are in line with Marcella's 2023 research which stated that there was a significant relationship between the menstrual cycle and worsening acne vulgaris. This is also in line with previous research conducted by Widiawaty et al, 2019 regarding the influence of menstrual phase on acne vulgaris for female students at the Faculty of Medicine, Riau University, the results showed that there was a significant relationship between menstrual phase and acne vulgaris.[3, 10]

The results of this study show that there is a proven relationship between the menstrual cycle and the incidence of acne vulgaris, this is because acne vulgaris is influenced by many factors, one of which is the role of hormones such as androgens, estrogen and progesterone. In women, acne vulgaris is sometimes associated with hormonal changes in the menstrual cycle. This is also supported by the fact that acne very often or usually occurs during puberty due to low levels of the estrogen and progesterone during the first few menstrual cycles. The hormone progesterone is thought to play a role in causing acne during premenstruation.[9]

The results of this study show that although most menstrual cycles are normal, most people experience acne vulgaris, this is due to androgens control the growth of sebaceous glands which are active during puberty and produce sebum.[3]

4.4 The Relationship Between Abnormal Menstrual Cycles and The Incidence of Acne Vulgaris

Based on the results of this research, it shows that there is no the relationship between abnormal menstrual cycles and the incidence of acne vulgaris in student at the

Faculty of Medicine, Baiturrahmah University, Padang, Class of 2022.

In line with Siregar's 2016 research on the relationship between menstrual cycle abnormalities and the incidence of acne vulgaris in female students at Nur Hidayah Kartasura Integrated Islamic High School, there was no significant relationship between menstrual cycle abnormalities and the incidence of acne vulgaris in female students at SMA Islam Terpadu Nur Hidayah Kartasura with p=0.130 and research conducted by Aziz in 2022 on students of the class of 2021 at the Faculty of Medicine, Batam University, obtained research results where there was no relationship between the menstrual cycle and acne vulgaris in students of the class of 2021, Faculty of Medicine, Batam University.[6, 17]

Respondents with irregular menstrual cycles had hyperandrogenism. Hyperandrogenism is a common cause of irregular menstruation in teenagers and adult women, can cause various anxiety, excessive hair growth, AV, and obesity. Increased androgen levels cause stimulation of sebum production which results in excessive proliferation of P. acnes and even ends in inflammation. Changes in sebum lipid composition are related to age and sebaceous gland activity. The effect of androgens on sebaceous cell proliferation and differentiation depends on the origin of the sebaceous glands, for example the sebaceous glands on the face are more sensitive to androgens.[6]

The results of the study show that there is no relationship between abnormal menstrual cycles and the incidence of acne vulgaris, this shows that menstrual disorders that occur in both oligomenorrhea and polymenorrhea disorders equally influence the incidence of acne vulgaris. Menstrual disorders, whether oligomenorrhea or polymenorrhoea, both affect hormones, meaning that hormonal changes in women suffering from acne vulgaris are significantly associated with irregular menstruation.[18]

5. Conclusion

Based on the results of research on the relationship between the menstrual cycle and the incidence of acne vulgaris instudent at the Faculty of Medicine, Baiturrahmah University, Padang, Class of 2022, then it can be concluded that there were 36 female students who experienced acne vulgaris; there were 31 female students who experienced normal menstrual cycles; there is relationship between the menstrual cycle and the incidence of acne vulgaris instudent at the Faculty of Medicine, Baiturrahmah University, Padang Class of 2022 (p=0.015); there is no relationship between abnormal menstrual cycles and the incidence of acne vulgaris instudent at the Faculty of Medicine, Baiturrahmah University, Padang Class of 2022 (p=1,000).

References

1. Sibero HT, Sirajudin A, Anggraini DI. Prevalensi dan gambaran epidemiologi akne vulgaris di Provinsi Lampung. JK Unila Jurnal Kedokteran Universitas Lampung. 2019;3(2).
2. Fadilah AA. Hubungan Stres Psikologis Terhadap Timbulnya Akne Vulgaris. Jurnal Ilmiah Kesehatan Sandi Husada. 2021;10(2):390-5.
3. Aziz T, Suryanti, Ramanda W. Faktor–Faktor yang Berhubungan Dengan Timbulnya Acne Vulgaris Pada Mahasiswi Angkatan 2021 Fakultas Kedokteran Universitas Batam. Zona Kedokteran: Program Studi Pendidikan Dokter Universitas Batam. 2022;12(1):58-67.
4. Hartono LM, Kapantow MG, Kairupan TS. Pengaruh Menstruasi terhadap Akne Vulgaris. e-CliniC. 2021;9(2):305-10.

5. Sinaga E, Saribanon N, Sa'adah SN, Salamah U, Murti YA, Trisnamiati A, et al. Manajemen Kesehatan Menstruasi: Universitas Nasional IWWASH Global One; 2017.
6. Siregar EDU, Ramona F, Dewi LM. Hubungan Antara Kelainan Siklus Menstruasi Dengan Kejadian Akne Vulgaris Pada Santriwati Sma Islam Terpadu Nur Hidayah Kartasura. Biomedika. 2017;8(2).
7. Soethama NMSM, Indira IGAAE. Profil umum akne vulgaris pada pelajar Sekolah Menengah Atas Negeri Denpasar Timur. E-Jurnal Medika Udayana. 2020;9(4).
8. Fernanda MD. Hubungan Fase Menstruasi Dengan Perburukan Akne Vulgaris Pada Mahasiswi Fakultas Kedokteran Universitas Lampung. Digital Repository Unila. 2023.
9. Elmiyati E, Fadhil I, editors. Hubungan waktu menstruasi dengan kejadian akne vulgaris pada mahasiswi kedokteran Abulyatama Aceh. Prosiding SEMDI-UNAYA (Seminar Nasional Multi Disiplin Ilmu UNAYA); 2019.
10. Widiawaty A, Darmani EH, Amelinda. Pengaruh Fase Menstruasi Terhadap Derajat Akne Vulgaris Mahasiswi Fakultas Kedokteran Universitas Riau. Media Dermato Venereologica Indonesiana. 2019;46:9-13.
11. Safitri FA, Pramuningtyas R, Prakoeswa FRS, editors. Hubungan Antara Kecemasan Dan Kebersihan Kulit Wajah Dengan Kejadian Akne Vulgaris Pada Mahasiswa Tingkat Akhir Fakultas Kedokteran Universitas Muhammadiyah Surakarta Angkatan 2017. Prosiding University Research Colloquium; 2021.
12. Akbar AR, Mona L, Tanjung S. Hubungan Pola Makan dengan Kejadian Akne Vulgaris pada Mahasiswa Fakultas Kedokteran Universitas Baiturrahmah Padang Angkatan 2019-2020. Jurnal Kedokteran Nanggroe Medika. 2022;5(2):1-10.
13. Agatha PC, Wijayadi LJ, Sugiharto S. Gambaran kadar sebum kulit wajah pada mahasiswa Fakultas Kedokteran Universitas Tarumanagara penderita akne vulgaris. Tarumanagara Medical Journal. 2021;3(1):136-42.
14. Fithriyana R. Hubungan kejadian acne vulgaris dengan kepercayaan diri pada siswi kelas XI di SMAN 2 Bangkinang Kota. Jurnal Ners. 2019;3(1):7-12.
15. Laura G, Sari T. Kaitan Antara Kualitas Tidur Dan Siklus Menstruasi Mahasiswi Program Studi Sarjana Kedokteran Fakultas Kedokteran Universitas Tarumanagara. Ebers Papyrus. 2023;29(1).
16. Nainggolan BW, Sukatendel K. Hubungan antara faktor stres dan siklus menstruasi pada mahasiswi Fakultas Kedokteran Universitas Sumatera Utara. Scripta Score Scientific Medical Journal. 2021;3(1):1-7.
17. Di Landro A, Cazzaniga S, Parazzini F, Ingordo V, Cusano F, Atzori L, et al. Family history, body mass index, selected dietary factors, menstrual history, and risk of moderate to severe acne in adolescents and young adults. Journal of the American Academy of Dermatology. 2012;67(6):1129-35.
18. Shrestha S. Correlation of hormonal profile and lipid levels with female adult acne in a tertiary care center of Nepal. 2018.