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Profile of Mild Acne Vulgaris Patients at Tertiary Hospital at Surabaya, Indonesia

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ABSTRACT

Background: One of the most prevalent skin conditions worldwide is acne vulgaris (AV). Even mild forms of AV could have an adverse impact on psychological wellbeing. **Purpose:** To explore the profile of mild AV patients in a tertiary care facility in Surabaya, Indonesia. **Methods:** This was a descriptive study conducted for eight weeks. Data regarding the patient's identity, history, skin type, and complaints related to AV or other complaints that arose were noted on the sample's medical record and collected for analysis. The Lehmann classification was used to assess the AV degree. **Result:** A total of 34 patients were included. Gender equality was similar in our study, and late adolescence (17-25 years) is the most dominant age group (73.5%). Genetics plays the biggest precipitating factor (73.5%), followed by stress (70.6%). Most patients had an oily skin type (91.2%) with Fitzpatrick's phototype 4 (85.3%). Comedone is the most prevalent lesion in our study (median = 10, range = 4-20). **Conclusion:** Most patients with mild AV had an oily skin type, and late adolescent is most dominant age group.

Keywords: acne vulgaris, mild degree, Lehmann classification, psychological wellbeing.

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BACKGROUND

About 85% of teenagers experience acne vulgaris (AV), a chronic condition of the pilosebaceous unit that can persist throughout adulthood in varied degrees of severity.[1,2] Approximately 2 million of adolescents with AV visits a doctor per year with a direct AV care expense in the United States reported to exceed 1 billion dollars per year. Subsequently, patients spent over 100 million dollars purchasing AV products without a prescription.[3]

Acne vulgaris lesions could cause scarring and post-inflammatory hyperpigmentation (PIH). All grades of AV lesions are susceptible to inflammation, and PIH has been linked to psychological and emotional disorders that have a significant negative influence on patients' ability to live healthy, fulfilling lives.[4,5] Even mild forms of AV could have an adverse impact on mental health (anxiety, depression), social interaction, self-confidence, and employment opportunities.[6,7] This study will discuss the profiles of mild AV patients who visited tertiary hospital as basic data on the demographic characteristics of acne vulgaris patients.

METHODS

This was a descriptive study conducted for eight weeks at the Cosmetic Medic Division outpatient clinic of Dr. Soetomo General Academic Hospital, Surabaya, Indonesia.

All AV patients with mild degrees who visited the Cosmetic Medic Division outpatient clinic of Dr. Soetomo General Academic Hospital, Surabaya, Indonesia, comprised the study population. The study sample was all of the study population that met the inclusion and exclusion criteria. Sampling was carried out by consecutive sampling, where each study

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subject was taken as a sample sequentially.

The inclusion criteria in this study were all patients with mild AV according to the Lehmann classification who did not receive AV treatment for one month and came to the Cosmetic Medic Division outpatient clinic, had generally adequate condition, and patients who were willing to be included voluntarily and signed informed consent. Participants with a known case or family history of Systemic Lupus Erythematous (SLE)/ Cutaneous Lupus Erythematosus (CLE) or who were pregnant were not eligible to participate in this study.

The study procedure involved the history-taking, which included the patient's identity, history, skin type, and complaints related to AV or other complaints that arose and were noted on the sample's medical record. Questions included the patient's identity (using initials), gender, age, education, occupation, and address. The next questions were current clinical complaints, time of complaint, and precipitating factors of AV. The Lehmann classification was used to assess the AV degree.

Data were processed using the Statistical Package for Social Sciences (SPSS) version 26. Demographic data and clinical characteristics of samples were presented in the form of descriptive statistics with frequency and percent for nominal and ordinal data types.

This study has been reviewed by the Ethics Committee reviewed by Health Study Ethics Committee at Dr. Soetomo General Academic Hospital, Surabaya, Indonesia. Patients who met the inclusion criteria were educated about the study and its procedures, and those who decided to participate signed an informed consent form.

RESULT

This study involved 34 patients with mild AV, based on Lehmann's classification. Table 1 shows the demographics of the participants in the study. The sex distribution was similar between males and females, with 17 samples (50%) each. The most frequent age group of samples was the late adolescence group, with 25 samples (73.5%). The most precipitating factor for the occurrence of mild AV was genetic, with 25 samples (73.5%).

Skin examination revealed that the most patients had oily skin types with 31 patients (91.2%) and Fitzpatrick's skin phototype 4 with 29 patients (85.3%) (Table 2). The distribution of the number of pustules, papules, comedones, and total lesions was calculated in this study (Table 3). The most common lesions found in patients were comedone lesions with a median lesion number of 10 and the number ranged from 4 to 20 lesions.

Table 1. General characteristics of samples

Category	Group	Total (%)
Sex	Female	17 (50)
	Male	17 (50)
Age group	Late adolescence (17-25 years)	25 (73.5)
	Early adult (26-35 years)	6 (17.6)
	Late adult (36-45 years)	3 (8.8)
Precipitating factor*	Hormone	15 (44.1)
	Genetics	25 (73.5)
	Food	18 (52.9)
	Stress	24 (70.6)
	Cosmetic	12 (35.3)

*One patient could have > one precipitating factors.

Table 2. Sample distribution based on skin examination.

Parameter	Type	Total (%)
Skin type	Oily	31 (91.2)
	Dry	3 (8.8)
Fitzpatrick's phototype	3	5 (14.7)
	4	29 (85.3)

Table 3. Lesion type distribution.

Lesion type	Median
Comedones	10 (4-20)
Papule	5 (3-12)
Pustule	0 (0-4)
Total lesion	16 (6-31)

DISCUSSION

Acne vulgaris is the most frequently mentioned skin disorder, especially in teenagers, because it could damage anyone's self-confidence. This skin disease is caused by chronic inflammation of the pilosebaceous follicles. Estimates place the prevalence of AV in various areas of the face and other parts of the body among adolescents anywhere from 35% to

nearly 100%, depending on the country and the age group.[7,8]

A total of 34 patients with a mild AV degree, based on the Lehmann classification, met the study sample inclusion criteria. Based on this study, the number of samples between females and males was similar. This result was different from several previous studies at the Tertiary Hospital from 2008-2010, where most patients were female.[9] Female AV patients accounted for two-thirds of dermatological visits for AV treatment, and one-third of all visits for AV treatment were made by female patients aged >25 years.[10] This is in accordance with a study by Nasrani and Purnawati, who reported that due to higher stress levels than men, women are more likely to visit doctors for AV treatment.[11] In a study from Bismala, based on a theoretical perspective, it is stated that interpersonal relationships play a greater role for women than men. Empirical studies show that women have more tendencies based on self-esteem in social relationships. This difference in results might be due to the fact that in today's modern era, awareness about the importance of keeping appearance between women and men is comparable; therefore, male patients will immediately seek AV treatment to improve their appearance.[12]

The largest age group in this study was late adolescence (17-25 years). This finding corroborated the findings of research on the prevalence and distribution of AV in teenagers by Okoro and colleagues, where the highest prevalence of AV was found in adolescents due to higher levels of androgen hormones and sebum production during puberty.[13] High levels of androgens will stimulate production, more sebum is a predisposing factor for clogged pores and the formation of comedones.[14] Acne vulgaris affects approximately 80% of patients in 12-25 year-old age group regardless of differences in sex and ethnicity. The onset of AV could vary in each age group, but it is more common at puberty and might continue into young adulthood. Acne vulgaris incidence generally occurs at the age of 14-17 years in women and 16-19 years in men.[15] Segre and Grice reported that the age distribution is important to note. During adolescence, the pilosebaceous unit ripens, which ads to an increase in the growth of lipophilic organisms such as *C. acnes*.[16]

The most prevalent precipitating factor for AV in this study was genetic factors, and followed by stress. Genetic factors have a role in AV development. Eighty-one percent of the population's variation is thought to be due to genetic causes, and several genetic polymorphisms impacting gene expression and/or function have been studied. The IGF1 repeat polymorphism (CA) 19123, the Pro12Ala polymorphism of PPARG124, the IL6-572 G/C polymorphism, and the IL1A-889 C/T125 polymorphism are all linked to acne. However, further research is still required to fully understand this phenomenon. In addition to shedding light on the pathogenesis of AV, proteomic analysis of sebaceous follicle templates extracted from 18 healthy individuals and 20 individuals with AV identifies proteins involved in tissue remodelling, wound healing, and inflammation. These proteins include lactotransferrin, myeloperoxidase, and neutrophil elastase inhibitors.[2]

Studies regarding the correlation between AV and stress have been widely reported, one of which reported the correlation between stress and AV incidence in medical students in North Sumatra in 2017. Stress was found to have a statistically significant ($p=0.005$) correlation with AV severity.[17] Zhang stated that stress is a risk factor for AV because there is a change in the level of corticotropin-releasing hormone (CRH) during stress, which plays a role in sebaceous gland function regulation. Corticotropin-releasing hormone also induces interleukin (IL)-6 and IL-11 production, which contribute to inflammation.[18] One study reported an increase of CRH expression in the sebaceous glands of AV patients compared to healthy skin, therefore AV lesions often worsen during periods of stress. However, the mechanism underlying the triggering of AV by stress is still unclear, although there have been explanations of mechanisms that have been proposed.[19] Another theory stated that stress is a condition that could affect one's emotions, thought processes, and conditions. Physiological stress will result in the activation of the hypothalamus-pituitary axis (HPA). These conditions might prolong the increase in ACTH. Glucocorticoids increased ACTH could stimulate an increase in androgen hormones, which function in trigger sebum and keratinocyte formation. Increased sebum and hyperkeratinocytes will result in AV.[20]

The majority of participants in this study had oily skin. The exact etiology of AV is not fully known; however, there are several pathologies related to the occurrence of AV, such as epidermal follicular hyperproliferation, excessive sebum production, inflammation, and the presence of *C. acnes*. Each process of AV pathogenesis is interrelated and also influenced by hormones and immunity. The resultant sebum then travels to the skin's surface via the pilosebaceous ducts. Keratinocytes in hair follicles receive linoleic acid from sebum as it exits the follicle,

resulting in a local deficiency of linoleic acid that causes follicular barrier disruption. This allows the free fatty acids formed by *C. acnes* through the action of their lipase enzymes or by other mechanisms on triglycerides to enter the follicle. Follicular wall damage may also result from oxygen stress or the production of free radicals by phagocytes in response to microbial invasion.[2]

The vast majority of patients are Fitzpatrick phototype 4. It is not possible to draw the conclusion from the literature that the pathophysiology of AV is different in people of colour than in those with lighter skin. Normal desquamation of follicular keratinocytes leading to follicular plug formation, increased sebum production in pilosebaceous follicles, microbial proliferation of *Propionibacterium acnes* in the sebum, and inflammation are all likely involved in the pathogenesis of AV in people of colour, just as they are in the light phototype.[21] Acne on coloured skin is inherently inflammatory, with significant sequelae to pigmentation. Many people see a dermatologist for help with pigmentation issues rather than acne. About 80% of African patients who have acne also use skin-whitening products. In pigmented skin, inflammatory lesions are the true target of AV treatment.[22]

The most common AV lesions found in this study were comedones, with a median number of lesions of 10 and range of 4-20. This result was similar to a study by Adityan, which found that all patients had closed comedones present in all patients (mean count = 6.67).[23]

In conclusion, a total of 34 mild AV patients were reported in this study. Our study showed a similar distribution of sexes, while late adolescent (17-25 years) is the most dominant age group and Genetic played the biggest precipitating factor. Our patients mostly had the oily skin type with Fitzpatrick's phototype 4. Lastly, comedone was the most prevalent lesion in our study.

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