

# Clinical Profile and Treatment of Acne Vulgaris Patients

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## Clinical Profile and Treatment of Acne Vulgaris Patients

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### 13 ABSTRACT

**Background:** Acne vulgaris (AV) is not a deadly condition may affect one's quality of life. Treatment of AV includes topical and oral, depending on the severity. Antibiotics as oral treatment should not be given alone because it can precipitate resistance. **Purpose:** To describe the clinical characteristics of AV in a tertiary hospital in Indonesia and evaluate the treatment given. **Methods:** This is a descriptive, retrospective study with a cross-sectional design. The study subject was classified based on severity according to Plewig and Kligman's acne grading. Further evaluation was made according to the type of lesion, the risk factor, topical and oral treatment in subjects with grades 2, 3, and 4. This research was conducted at the Cosmetic Medic Division, Dermatology and Venereology Outpatient Clinic at Dr. Soetomo General Academic Hospital Surabaya based on medical records from the period of 2017 to 2019. **Result:** From 2017 to 2019, there were 525 (1.1%) new AV patients out of a total of 45,754 new patients. AV was the major diagnosis in the Cosmetic Medic division. AV grades 2, 3, and 4 were found in 167 patients (32.0%). The most common lesion was papulopustular (75.4%) and the most common risk factor was hormonal (58.7%). All the patients received tretinoin, clindamycin gel 1.2%, and sunscreen for topical treatment. Doxycycline was the most common oral antibiotic used (98.2%) **Conclusion:** The most common AV grade in this study was mild AV. Oral antibiotics were given to moderate-to-severe AV patients in combination with topical treatment to prevent resistance.

**Keywords:** acne vulgaris, oral antibiotics, psychological wellbeing, topical treatment.

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### 5 BACKGROUND

Acne vulgaris (AV) is a chronic inflammatory disease of the pilosebaceous unit characterized by non-inflammatory lesions (open comedones/blackheads and closed/whiteheads) and inflammatory lesions (papules, pustules, nodules, and cysts). Lesions can be found on the face, neck, chest, or back where there are many pilosebaceous glands.<sup>1,2</sup> According to the Global Burden of Disease (GBD) study, AV occurs in about 85% of young adults aged 12-25 years. In the United States, more than 85% of patients suffering from AV are adolescents, regardless of gender and ethnicity.<sup>3</sup> In a study from Singapore, AV was found to be dominant

in 88% of adolescents aged 13-19 years. AV is mostly found in male adolescents, while in the post-adolescent period it is more common in girls.<sup>4,5</sup> A study in Indonesian's teenagers showed that AV caused anxiety and affected their quality of life without considering the severity of AV.<sup>6</sup> Another study exhibited correlation between an AV patient's quality of life and the duration of AV.<sup>7</sup>

The causes of AV are multifactorial. The four main causes of AV are pilosebaceous glands, namely abnormal proliferation and desquamation of keratinocytes as the initial cause of pilosebaceous glands, increased production of androgen hormones

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leading to sebum production, the colonization of *Cutibacterium acnes*, and inflammation. Several genetic factors are suspected of triggering the occurrence of AV, including the consumption of chocolate and milk-based products; lifestyle; use of cosmetics that can cause exposure; and exposure to the environment that contains oxidants and pollutants.<sup>1</sup>

The basis for selecting treatment is adjusted to the type of lesion, severity, and precipitating factors.<sup>3,8,9</sup> The classification used to assess the severity of acne vulgaris is based on Plewig and Kligman, who classifies as comedonal acne, papulopustular acne, grade 1 to 4, and also acne conglobate.<sup>3</sup>

AV is not an infectious disease, but treatment with oral antibiotics has been carried out for almost 40 years. Oral antibiotics have long been used to treat moderate-to-severe AV (grades 2, 3 and 4 according to Plewig and Kligman), but in some skin health centre, treatment with systemic antibiotics is carried out after AV fails to be treated with topical treatment<sup>2</sup>. Oral antibiotics are recommended for the treatment of moderate or severe inflammatory AV. These antibiotics are often given in combination with topical AV drugs, which may include a benzoyl peroxide-containing formulation to increase efficacy and minimize the development of *Cutibacterium acnes* resistance. The choice between topical and systemic antibiotics is generally based on the extent of the lesion and the severity of the inflammatory lesion. The most widely used oral antibiotics are cyclins (tetracycline, minocycline, doxycycline, and their derivatives), macrolides (erythromycin and azithromycin), and lincosamides (clindamycin).<sup>2</sup> Based on research by Barbieri *et al.*, it was said that although oral antibiotics are currently used as a treatment for AV, clinicians must be aware of the side effects and the risk of resistance. Giving these antibiotics can affect the presence of normal flora in the pharynx. It can cause pharyngitis and further cause inflammatory bowel syndrome. It is also necessary to consider the incidence of resistance due to the use of broad-spectrum antibiotics for the treatment of AV.<sup>10</sup>

This retrospective study aims to evaluate the profile of AV patients and the treatment given, especially the use of systemic antibiotic therapy. This study is a continuation of previous research conducted by Chesia *et al.* The study was conducted at the Cosmetic Medic Division of Dermatology and Venereology Outpatient Clinic, Dr. Soetomo General Academic Hospital Surabaya for the period January 2017 to December 2019. It is hoped that with the discovery of new cases, better management and better choice of therapy can be achieved. Thus it can increase the success of therapy and patients' satisfaction.

## METHODS

The research design used was a retrospective descriptive study that aimed to evaluate the profile of AV patients and the use of oral antibiotics as therapy in patients with AV grades 2, 3, and 4 at the Cosmetic Medic Division, Dermatology and Venereology Outpatient Clinic at Dr. Soetomo General Academic Hospital Surabaya for the period January 2017-December 2019. The data was collected with Excel 2010 and then processed with SPSS. This study utilized a total sampling technique from data obtained from the medical records of AV patients. The inclusion criteria used were newly diagnosed patients with acne vulgaris grade 2, 3, and 4 from January 2017 to December 2019. Data collected includes sex, severity, type of lesion, risk factors, topical, and oral treatment. This research was conducted at the Cosmetic Medic Division, Dermatology and Venereology Outpatient Clinic at Dr. Soetomo General Academic Hospital Surabaya from August to September 2020. The collected data was processed and analyzed descriptively. This study was approved by the Ethics Committee review at Dr. Soetomo General Hospital Surabaya (2022/KEPK/VI/2020).

## RESULT

This was a descriptive observational study based on secondary data from the medical records of AV patients in the Dermatology and Venereology Outpatient Clinic at Dr. Soetomo Academic Hospital Surabaya during the period of January 2017 to December 2019. During the 3-year period starting from 2017 to 2019, there were 525 (1.1%) new AV patients from a total of 45,754 new patients in all divisions, with details of 224 (1.4%) patients in 2017, 201 (1.4%) patients in 2018, and 100 (0.6%) patients in 2019. In the Cosmetic Medic division itself, AV patients dominate with percentages of 67.0%, 55.0%, and 46.5% in 2017, 2018, and 2019 (Table 1).

It was found that in AV, female patients are more common than male patients, with 129 patients (57.6%), 159 patients (79.0%), and 64 (64.0%) in 2017, 2018, and 2019 respectively. Based on severity, AV patients were dominated by AV grade 1 in 2017, 2018, and 2019, namely 164 patients (73.0%), 115 (56.8%), and 79 patients (79%), respectively. In 2017 and 2018, AV grade 3 patients came in second with 49 patients (22.0%) and 65 patients (33.0%).

Based on the type of lesion, papulopustular was the most common lesion in 48 patients (80.0%) in 2017, 61 patients (71.0%) in 2018, and 17 patients (81.0%) in 2019. In 2017, comedonal lesions were the least common in 3 patients (5.0%). In 2018, conglobata lesions were the least common in 3 patients (3.5%), and

this number decreased compared to 2017 when conglobata lesions were found in 8 patients (13.3%). Meanwhile, in 2019, there were no patients with conglobata lesions.

The distribution of the precipitating factors for AV onset in AV patients at the Cosmetic Medic

Division, Dermatology and Venereology Outpatient Clinic at Dr. Soetomo General Academic Hospital Surabaya in the 2017 - 2019 period was mostly due to hormonal factors experienced by 98 patients (58.7%) of 167 patients with AV degrees 2, 3, and 4.

**Table 1.** The number of visits in Dermatology and Venereology Outpatient Clinic

Characteristics	Year			Total
	2017	2018	2019	
All divisions in the outpatient clinic	15506	14811	15437	45754
Cosmetic Medic division	331	365	215	911
Patient with acne vulgaris	224(67.0%)* (1.4%)**	201(55.0%)* (1.4%)**	100(46.5%)* (0.6%)**	525(57.6%)* (1.1%)**

\*% to patients from Cosmetic Medic division only

\*\*% to patients from all divisions in the outpatient clinic

**Table 2.** Distribution of acne vulgaris (AV) patients by sex, grade, types of AV, and risk factor

	Year			Total n (%)
	2017 n (%)	2018 n (%)	2019 n (%)	
<b>Sex</b>				
Female	129 (57.6)	159 (79.0)	64 (64.0)	352 (67.0)
Male	95 (42.4)	42 (21.0)	36 (36.0)	173 (33.0)
Total	224 (100.0)	201 (100.0)	100 (100.0)	525 (100.0)
<b>Grade of severity</b>				
Grade 1	164 (73.0)	115 (56.8)	79 (79.0)	358 (68.0)
Grade 2	5 ( 2.0)	6 ( 3.0)	11 (11.0)	22 ( 4.0)
Grade 3	49 (22.0)	65 (33.0)	10 ( 8.0)	124 (24.0)
Grade 4	6 ( 3.0)	15 ( 7.0)	0 ( 0.0)	21 ( 4.0)
Total	224 (100.0)	201 (100.0)	100 (100.0)	525 (100.0)
<b>Types of acne vulgaris</b>				
Comedonal	3 ( 5.0)	21 (24.4)	1 ( 4.7)	25 (15.0)
Papulopustular	48 (80.0)	61 (71.0)	17 (81.0)	126 (75.4)
Conglobata	8 (13.3)	3 ( 3.5)	0 ( 0.0)	11 ( 6.6)
No data	1 ( 1.7)	1 ( 1.1)	3 (14.3)	5 ( 3.0)
Total	60 (100.0)	86 (100.0)	21 (100.0)	167 (100.0)
<b>Risk Factor</b>				
Cosmetics	19	35	9	63 (37.7%)
Hormonal	36	52	10	98 (58.7%)
Dietary	44	34	9	87 (52.1%)
Stress	26	30	9	65 (38.9%)
Genetics	16	23	4	43 (25.7%)

\*1 patient can have more than 1 risk factor

Based on Table 3, it is noted that all AV patients in grades 2, 3, and 4 in 2017, 2018, and 2019 received topical treatment in the form of tretinoin, 1.2% clindamycin gel, and sunscreen. Oral antibiotics in the form of doxycycline were given more often than

erythromycin where only 3 patients (5.0%) in 2017 received erythromycin, as oral antibiotic therapy. In 2018 and 2019, all AV patients in grades 2, 3, and 4 received oral antibiotic therapy in the form of doxycycline.

**Table 3.** Distribution of topical and oral treatment types in new acne vulgaris grade 2, 3, and 4

Treatment	Year			Total
	2017 n= 60	2018 n= 86	2019 n= 21	
<b>Topical:</b>				
- Tretinoin	60 (100.0)	86 (100.0)	21 (100.0)	167 (100.0)
- Benzoyl peroxide	56 (93.3)	64 (74.4)	17 (81.0)	137 (82.0)
- Clindamycin gel 1,2%	60 (100.0)	86 (100.0)	21 (100.0)	167 (100.0)
- Sunscreen	60 (100.0)	86 (100.0)	21 (100.0)	167 (100.0)
<b>Oral:</b>				
- Erythromycin	3 (5.0)	0 (0.0)	0 (0.0)	3 (1.8)
- Doxycycline	57 (95.0)	86 (100.0)	21 (100.0)	164 (98.2)

## DISCUSSION

There were a total of 525 new acne vulgaris (AV) patients who were recorded as visiting the Cosmetic Medic Division, Dermatology and Venereology Outpatient Clinic at Dr. Soetomo General Academic Hospital Surabaya. The trend in the number of visits during the last 3 years has decreased. This could be due to the declining trend in the number of patient visits as reported in the internal report of Dr. Soetomo General Academic Hospital. In the first quarter of 2019, there was a 5% decrease in the number of patients attending the Dermatology and Venereology Outpatient Clinic. This is also related to tiered referrals so that patients with mild AV have been treated at lower-level health facilities.<sup>11</sup>

In this study, it was found that the number of female patients was higher than that of male patients. These results are consistent with a study by Lynn et al. in America who found a higher prevalence of women with AV in a younger population.<sup>12</sup> It could also be due to an earlier onset of puberty in women.<sup>5,13,14</sup> A higher number of female patients can also occur because women are more self-conscious and have lower self-esteem if they suffer from AV. This issue can arise because of culture and the media which emphasize that women must have clear skin to be perceived as beautiful.<sup>15</sup> The effect of this perception can make women seek help more often by coming to the skin clinic or dermatologist practice compared to men.

Acne vulgaris patients with mild degrees visited clinics more often compared to moderate-severe ones. These results are similar to the data obtained from a systematic review of previous studies which found the mean severity of acne vulgaris was mild at 66%, moderate at 33%, and severe <10%.<sup>5</sup> Research in Bandung also found that 49.5% of patients who came to the dermatology clinic with AV were classified as mild, but the number was not far from moderate (43.58%) and severe (6.87%).<sup>13</sup> Research in Kerala,

India had different findings; among 100 patients, as many as 74% were moderate-severe degrees. Researchers proposed the possibility that acne is more easily inflammatory so that scars appear in the population in that area.<sup>16</sup>

This study focused on patients with AV degrees 2, 3, and 4 according to Plewig and Kligman, because this severity score is more detailed, and the patients in the Cosmetic Medic Division of Dermatology and Venereology Outpatient Clinic were diagnosed with AV severity by Plewig and Klingman. The patients that were diagnosed with grade 1 AV were excluded from observation because patients with grade 1 AV were only given topical treatment and not given oral antibiotics since it is only mild AV. Of the 525 new patients who visited the Cosmetic Medic Division of Dermatology and Venereology Outpatient Clinic, Dr. Soetomo General Academic Hospital Surabaya for the 2017–2019 period, there were 167 people (31.8%) in AV grades 2, 3, and 4 categories according to the number of inflammatory and non-inflammatory lesions found during the visit to the clinic. A total of 22 patients of AV grade 2 (4.2%), grade 3 of 124 people (23.6%), and grade 4 with a total of 21 people (4%) all received systemic antibiotic therapy, which was given orally, as an adjunct to topical treatment. In these patients, oral antibiotics were not given as the sole therapy, according to the recommendations agreed upon by the experts, one of which was to reduce the risk of developing antibiotic resistance.<sup>17</sup>

Topical tretinoin is given to all patients to enhance the anti-inflammatory effect and prevent new comedones from forming due to hyperkeratinization. Topical administration of tretinoin as a drug in combination therapy for AV is in accordance with a systematic review by Kolli et al., which states that the combination of tretinoin with various other drugs such as benzoyl peroxide, topical clindamycin, and salicylic acid can have a synergistic anti-inflammatory effect.

Meanwhile, AV with more severe degrees can be treated well with topical tretinoin in combination with oral antibiotics, compared to oral antibiotics as monotherapy.<sup>18</sup>

Topical tretinoin can cause the skin to be sensitive to sunlight, so this is where sunscreen plays the role to protect the skin that may be irritated by tretinoin from the sun to prevent sun damaged skin like hyperpigmentation, it can also cause more irritation because tretinoin causes peeling of the outer layer of the stratum corneum, so it is recommended to use it at night. Therefore, all patients in this study were also given sunscreen as an ingredient in combination therapy for AV.<sup>19,20</sup>

Benzoyl peroxide in some patients is used as an antibacterial against *Cutibacterium acne*, which works by releasing free radicals and has a slight comedolytic effect. The use of benzoyl peroxide as an adjunct to antibiotic therapy also has a role in preventing antibiotic resistance. Marson *et al.* also mentioned that benzoyl peroxide is often used as a combination treatment in AV along with topical antibiotics and/or tretinoin. Topical clindamycin is usually used in combination with other topical drugs because its use as monotherapy increases the incidence of drug resistance.<sup>19</sup>

The majority of oral antibiotics given to patients with AV grades 2, 3, and 4 in this study were doxycycline. Doxycycline is a tetracycline class of antibiotics, which based on various studies has been agreed upon as the first-line therapy for moderate-severe AV. Of the 167 moderate-severe AV patients, 164 (98.2%) of whom received oral doxycycline therapy. Three patients (1.8%) received oral erythromycin therapy, because of the contraindication to doxycycline. This is in accordance with the clinical practice guide by the Indonesian Society of Dermatology and Venereology (INSDV) and also the literature that mentions macrolide antibiotics, e.g., erythromycin and azithromycin, as an alternative to doxycycline in AV patients who require oral antibiotics.<sup>17</sup>

The limitation of this study is that the compliance to follow up is low in many patients. Many patients come to the outpatient clinic and then never follow up again. The conclusion in this study is that as a doctor we need to give patients good education about the compliance using the treatment, the effect that may happen when using the topical treatment, an also educate patients about how to consume antibiotics. AV treatment is a long-term treatment, it takes time to achieve the satisfaction outcome that patients want.

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