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PROFILE OF ACNE VULGARIS PATIENTS RECEIVING CHEMICAL PEELING THERAPY AT THE DERMATOLOGY AND VENEREOLOGY CENTER OF DR. SOETOMO HOSPITAL, INDONESIA

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ABSTRACT

Background: Acne vulgaris is a common inflammatory skin disorder affecting pilosebaceous follicles, characterized by pleomorphic lesions such as comedones, papules, pustules, nodules, and cysts. The etiology is multifactorial, involving hormonal imbalance, genetic predisposition, dietary habits, cosmetic use, psychological stress, lifestyle factors, and bacterial colonization by *Cutibacterium acnes*. Chemical peeling is one of the therapeutic options used to manage acne by improving lesions and skin appearance.

Purpose: This study aimed to describe the clinical profile of acne vulgaris patients who underwent chemical peeling therapy at the Dermatology and Venereology Outpatient Unit of Dr. Soetomo General Hospital between 2018 and 2023.

Methods: A descriptive study design was applied using secondary data obtained from medical records of patients who received chemical peeling therapy and had complete documentation.

Result: Of 96 patients, 87.5% patients were female, age 18–65 years (13.54%). Acne was the main initial complaint (97.92%), and hormonal factors were the most common etiological factor (66.67%). Comedones were the most frequently observed lesions (97.92%), predominantly located on the face (98.96%). The majority of patients were diagnosed with mild acne vulgaris (82.29%). All patients received pre-peeling treatment with tretinoin 0.025–0.05%.

Salicylic acid 20% was the most commonly used peeling agent (88.54%), and SPF 30 sunscreen was the most frequently prescribed post-peeling therapy (95.38%). Most patients returned for follow-up, and more than half showed clinical improvement.

Conclusion: Acne vulgaris patients undergoing chemical peeling were predominantly adult females with mild acne, mainly presenting facial comedonal lesions, and demonstrated favorable outcomes following treatment.

Keywords: Acne Vulgaris, Chemical Peeling, Profile, Clinical Manifestation

1 INTRODUCTION

Acne vulgaris is an inflammatory condition of the pilosebaceous unit that predominantly manifests during adolescence, while it can impact individuals of any age.[1] Acne vulgaris clinically manifests as a variety of lesions, including comedones, papules, pustules, nodules, and cysts. Lesions are primarily distributed on the face, forehead, upper arms, chest, and back.[2] Acne vulgaris is typically seen as a self-limiting illness; yet, its etiology is complicated and remains incompletely understood. Multiple contributing factors have been identified, including endocrine and genetic influences, dietary practices, cosmetic application, psychological stress, lifestyle choices, bacterial colonization by *Cutibacterium acnes* (formerly *Propionibacterium acnes*), and exposure to various chemical agents.[3] The interplay of these elements contributes to the intricate etiology of acne vulgaris, affecting disease severity and therapy efficacy.

Epidemiological findings underscore the significant burden of acne vulgaris in clinical practice. A retrospective analysis at Dr. Soetomo General Hospital, Surabaya, from January 2017 to December 2019 identified 525 cases of acne vulgaris, representing 1.1% of 45,754 new patients across all hospital departments. In the Medical Cosmetic Division, acne vulgaris was the predominant diagnosis, accounting for 67.0% of cases in 2017, 55.0% in 2018, and 46.5% in 2019. The peak incidence occurred in 2017, with 224 patients (1.4%). Female patients constituted 57.6% in 2017, 79.0% in 2018, and 64.0% in 2019.[4] The age group most impacted was teenagers and young people aged 15 to 24 years.[5] Despite being categorized as a benign dermatological disorder, acne vulgaris can profoundly affect patients' psychological health, social interactions, and overall quality of life. Patients often encounter anxiety, despair, and diminished self-esteem, potentially resulting in social disengagement and compromised daily functioning. Thus, prompt and efficient care is crucial to reduce the physical and mental impact of the disease. The management of acne vulgaris seeks to target many pathogenic causes and encompasses topical, systemic, and adjunctive medications. Among adjuvant therapy techniques, chemical peeling has garnered interest due to its comparative safety, simplicity of application, and clinical effectiveness. Diverse chemical peeling agents have been employed in acne treatment, including resorcinol, phenol, and Jessner's solution, alongside newer agents such as glycolic acid (GA), salicylic acid (SA), and trichloroacetic acid, which are linked to reduced undesirable effects.[6]

Although the utilization of chemical peeling for active acne vulgaris is on the rise, the data about its overall efficacy and safety remains unclear when assessed across clinical outcomes.[7] This study was a retrospective descriptive analysis aimed at assessing the profiles of patients with acne vulgaris who received chemical peeling therapy at the Outpatient Unit of Dermatology and Venereology, Dr. Soetomo General Hospital, Surabaya, from 2018 to 2023.

2 METHODS

This study utilized a retrospective descriptive design to assess the characteristics of patients with acne vulgaris who received chemical peeling therapy at the Outpatient Unit of Dermatology and Venereology, RSUD Dr. Soetomo Surabaya, from January 2018 to December 2023. All patients who were diagnosed with acne vulgaris and received chemical peeling therapy during the time frame of the study were included in the study population. A total sampling technique was employed, incorporating all patients who fulfilled the inclusion criteria as study subjects. Patients were eligible if they had a confirmed diagnosis of acne vulgaris and had undergone chemical peeling therapy; those with incomplete medical records were excluded.

Starting in September 2023, data were collected from secondary sources in the form of medical records. The number of patients, their age and sex, their main complaints and what caused them, their physical examination results (such as the type and shape of the lesions and where they were most likely to appear), their diagnosis based on the severity of their acne, the types of treatment they received, and the results of their follow-up were all looked at. The World Health Organization's system was used to group patients by age. The Lehmann grading system was used to rate the severity of acne. It divides acne vulgaris into mild, moderate, and severe groups based on the number of comedonal lesions, inflammatory lesions, and total lesions. There were three types of treatment: pre-peeling, peeling, and post-peeling. The results of the follow-up were divided into three groups: healed, improved, or not improved, based on clinical evaluation and changes in acne severity.

Microsoft Excel was used to process the data, which included editing, coding, entering, and cleaning the data to make sure it was correct and consistent. Descriptive statistical methods were used to analyze the data, and the results were shown in tables and diagrams to make them easier to understand. The Research Ethics Committee of RSUD Dr. Soetomo Surabaya gave this study the go-ahead. Using only initials protected patient privacy, and all patient information was kept private and only used for research and educational purposes.

3 RESULT

The medical records of RSUD Dr. Soetomo showed that 922 people with acne vulgaris were treated between 2018 and 2023. 805 of these patients were not eligible because they had not had chemical peeling therapy, and 21 were not eligible because they did not have enough medical information. As a result, 96 patients met the inclusion criteria and were included in the final study. Based on the World Health Organization (WHO) age classification, most of the patients were between 18 and 65 years old (n = 83; 86.46%). There were 13 patients (13.54%) who were between 0 and 17 years old. There were no patients recorded in the older age groups (≥66 years). The youngest patient was 15 years old, and the oldest was 52 years old. In terms of sex distribution, there were 84 female patients (87.5%) and 12 male patients (12.5%) (**Table 1)**.

Table 1: Distribution of Age Groups and Sex of Acne Vulgaris Patients Undergoing Chemical Peeling at the Dermatology and Venereology Clinic, RSUD Dr. Soetomo, Surabaya (2018–2023)

Variable		Frequency (n)	Percentage (%)
Age Group	0–17 years	13	13.54
	18–65 years	83	86.46
	66–79 years	0	0
	80–99 years	0	0
	>100 years	0	0
Sex	Male	12	12.5
	Female	84	87.5
Total		96	100

A significant number of patients (97.92%) said that acne was their main problem. The main reasons people said they had problems were hormones (66.67%) and stress (61.46%). On the examination, comedones (97.92%) and papulopustular lesions (93.75%) were the most common complaint, and almost all of the cases were on the face (98.96%). Mild acne vulgaris was the most common diagnosis, making up 82.29% of cases. The most common peeling agent was salicylic acid 20% (n = 85; 88.54%), followed by glycolic acid 25% (8.33%) and 10% (3.13%). Ninety-five percent of the patients received sunscreen with an SPF of 30 after their peeling. Clinical improvement was observed in 55.21% of patients who returned for follow-up (71.88%) (**Table 2**).

Table 2: Distribution of Clinical Characteristics, Treatment, and Outcomes of Acne Vulgaris Patients Undergoing Chemical Peeling at the Dermatology and Venereology Clinic, RSUD Dr. Soetomo, Surabaya (2018–2023)

Variable	Category	Frequency (n)	Percentage (%)
Predisposing Factors*	Hormonal	64	66.67
	Stress	59	61.46
	Diet	48	50.00
	Cosmetic use	47	48.96
	Genetic	31	32.39
Lesion Characteristics*	Comedones	94	97.92
	Papulopustular	90	93.75
	Nodules	34	35.42

	Scars	40	41.67
	Hyperpigmentation	17	17.71
	Abscess	7	7.29
	Papules	5	5.21
	Erythema	4	4.17
	Pustules	2	2.08
Pre-peeling Treatment	Tretinoin 0.025–0.05%	96	100
Peeling Agent	Salicylic Acid (SA) 20%	85	88.54
	Glycolic Acid (GA) 25%	8	8.33
	Glycolic Acid (GA) 10%	3	3.13
Post-peeling Care	Sunblock SPF 30 (gel/lotion)	92	95.38
	None	4	4.17
Follow-up	Returned for follow-up	69	71.88
	Lost to follow-up	27	28.13
Treatment Outcome	Improved	53	55.21
	No improvement	6	6.25
	No significant change	10	10.42
	Not evaluated (lost to follow-up)	27	28.13

*One patient may have more than one predisposing factor and more than one lesion type.

4 DISCUSSION

Acne vulgaris is a prevalent dermatological condition impacting teenagers, while it is also commonly seen in adults and children.[1] The highest occurrence often transpires between the ages of 14 and the early thirties. A study in Germany indicated that 64% of acne sufferers were between 20 and 29 years old, while 43% were between 30 and 39 years old.[8] Additionally, figures from the Global Burden of Disease (GBD) study reveal that around 85% of adolescents and young adults aged 12–25 years suffer from acne vulgaris, with its prevalence rising internationally.[9] The current study revealed that the majority of patients receiving chemical peeling therapy were within the 18–65-year age bracket (86.46%), while those aged 0–17 years constituted 13.54%. These data underscore that acne is not confined to youth but often continues throughout maturity. The prevalence of adult patients may be attributed to hormonal factors. In adolescence and early adulthood, heightened androgen production enhances sebaceous gland activity, leading to excessive sebum production and follicular blockage. This milieu enables the colonization of *Cutibacterium acnes* and fosters the development of inflammatory lesions.[10] Moreover, medication adherence is pivotal in the management of acne. Tobiasz et al. (2022) indicated that inadequate adherence is prevalent among school-aged patients, persons with early-onset symptoms, and those with insufficient information regarding acne, potentially leading to unsatisfactory outcomes.[11]

The majority of patients in this study were female, comprising 87.5% of the sample. This conclusion aligns with prior research indicating increased clinician attendance among women with acne.[12] Hormonal changes, especially those linked to the menstrual cycle, pregnancy, and hormonal contraception, are recognized as significant causes of acne in women.[13,14] Geller (2014) indicated that 65% of participants experienced an exacerbation of acne in the week prior to menstruation, underscoring the influence of hormonal fluctuations.[15] Furthermore, women generally exhibit heightened awareness of cosmetic appearance and are more inclined to pursue therapy promptly, whereas men frequently postpone consulting until the condition intensifies.[5] Adult-onset or persistent acne in women is often linked to androgen imbalance and disorders like polycystic ovarian syndrome (PCOS), which exacerbate sebum production and follicular hyperkeratinization.[16,17]

Acne was the most common complaint across practically all patients (97.92%) in terms of clinical presentation. Chemical peeling has been a common treatment option, especially for acne that won't go away or doesn't respond to other treatments. Topical treatment alone may produce suboptimal results and need considerable patient compliance.[11] Chemical peeling causes controlled exfoliation of the epidermis, promotes keratolysis, and offers comedolytic and anti-

inflammatory effects.[13,18] This mechanism enables its use in both inflammatory and non-inflammatory acne, as well as post-inflammatory hyperpigmentation and mild to moderate acne scars.[19]

Hormonal factors were identified as the primary predisposing factor (66.67%), followed by stress, dietary influences, cosmetic use, and genetic predisposition. Stress can worsen acne by stimulating the hypothalamic–pituitary–adrenal axis, leading to increased production of corticotropin-releasing hormone (CRH) and adrenocorticotropic hormone (ACTH), which subsequently stimulates testosterone release.[20,21] Certain dietary components, particularly high-glycemic-index meals and dairy products, may increase insulin and insulin-like growth factor-1 (IGF-1) levels, hence promoting sebaceous gland activity and worsening acne.[22,23] Cosmetics that include comedogenic ingredients like cetyl alcohol and lanolin may make acne worse.[24,25] Also, having a family history of acne in your mother greatly increases your chances of having moderate to severe acne.[26]

Comedones were the most common type of lesion found (97.92%), followed by papulopustular lesions (93.75%). Microcomedones are the first sign of acne and the first stage of its development. They are caused by hyperkeratotic obstruction in the follicular infundibulum.[27] The accumulation of keratin and sebum causes the formation of closed and open comedones, while the proliferation of Cutibacterium acnes and the host's immune responses result in inflammatory papules, pustules, and nodules.[28] The majority of patients exhibited facial involvement, consistent with the heightened density of sebaceous glands in this region. Most of the patients (82.29%) had mild acne, followed by moderate and severe cases. This distribution aligns with prior studies demonstrating that moderate acne is the primary clinical presentation.[29] Moderate and severe acne, on the other hand, have more papules, pustules, and nodules, which makes scarring more likely.

All patients received topical tretinoin (0.025–0.05%) as a pre-peeling therapy. Pre-peeling preparation increases the turnover of the epidermis, makes the stratum corneum thinner, helps peeling penetrate better, and reduces issues after the procedure.[30] Salicylic acid (SA) at 20% was the most common peeling agent used (88.54%), followed by glycolic acid (GA). Salicylic acid is a lipophilic beta-hydroxy acid with keratolytic, comedolytic, and anti-inflammatory properties, making it highly effective for treating acne.[25] Its consistent effectiveness and enhanced safety profile contribute to its widespread application. Studies indicate significant reductions in both inflammatory and non-inflammatory lesions with SA peeling.[31] Glycolic acid is an alpha-hydroxy acid that helps the skin peel and restructure, although it can cause irritation at high levels.[32] It is very important to protect your skin after peeling since superficial peeling makes the stratum corneum thinner and increases the risk of melanocyte stimulation. [30] In this study, most patients received SPF 30 sunscreen as a post-peeling treatment. 71.88% of patients followed up, whereas 28.13% did not. For the best results, chemical peeling usually requires 4 to 6 sessions spaced 2 to 4 weeks apart. Insufficient understanding of treatment options and dissatisfaction with outcomes have been identified as common reasons for discontinuation.[33]

More than half of the patients (55.21%) showed clinical improvement, which is in line with the therapeutic methods of SA and GA for reducing the number and severity of lesions. However, several patients exhibited neither improvement nor worsening, highlighting the complex nature of acne and the variability in therapeutic effectiveness across individuals. Acne is a long-term condition that can get worse or better over time. This is why ongoing follow-up and patient education are so important for getting long-term therapy success.[12] This study has some drawbacks. Incomplete medical records, particularly about treatment initiation times and follow-up intervals, impeded a thorough evaluation of therapeutic efficacy. The retrospective descriptive design and paper-based approach hindered data completeness and impeded causal inference.

Based on the study results, most of the patients with acne vulgaris who had chemical peeling at RSUD Dr. Soetomo Surabaya between 2018 and 2023 were classified as having mild acne. The most prevalent clinical findings were active lesions such comedones and papulopustular lesions. Hormonal changes were the most common cause, followed by stress, food, cosmetic use, and genetic factors. Before the peeling operation, all patients were given topical tretinoin. The most common peeling agent was 20% salicylic acid. Most of the patients also used SPF 30 sunscreen following the surgery as part of their post-peeling treatment. A follow-up study revealed that over fifty percent of the patients who returned had clinical improvement subsequent to therapy. But other patients did not get better or did not come back for follow-up, so it was impossible to tell how well their treatment worked. Future prospective trials with standardized documentation are recommended to improve the assessment of long-term effects and optimize chemical peeling techniques in acne treatment.

5 CONLUSION

Acne vulgaris patients undergoing chemical peeling at the Dermatology and Venereology Outpatient Unit of Dr. Soetomo General Hospital from 2018 to 2023 were predominantly adult females with mild acne vulgaris. Comedones and papulopustular lesions were the most frequently observed manifestations, with facial involvement being predominant. Hormonal factors were the most commonly reported predisposing factor. Salicylic acid 20% was the most frequently

used peeling agent, with tretinoin as pre-peeling treatment and SPF 30 sunscreen as post-peeling care. More than half of the patients who completed follow-up demonstrated clinical improvement, suggesting favorable outcomes of chemical peeling in acne vulgaris management. However, the retrospective design and incomplete follow-up limit the assessment of treatment effectiveness. Further prospective studies with standardized treatment and follow-up protocols are warranted.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare that there are no conflicts of interest related to this study.

Statement of ethical approval

This study was approved by the Health Research Ethics Committee of Dr. Soetomo General Hospital, Surabaya, Indonesia (Reference No. 1530/LOE/301.4.2/XI/2023, dated November 30, 2023).

Statement of informed consent

The requirement for informed consent was waived by the Health Research Ethics Committee due to the retrospective nature of the study and the use of secondary data from medical records.

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