### Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page:<u>www.jamdsr.com</u>

doi:10.21276/jamdsr

Index Copernicus value [ICV] =82.06

(e) ISSN Online: 2321-9599;

(p) ISSN Print: 2348-6805

# **Original Research**

## **Observing Prescription Trends for Acne Vulgaris Treatment: An Analytical Study of Drug Utilization**

Anup Goyal

Associate Professor, Department of Skin & VD, Venkateshwara Institute of Medical Sciences, Gajraula, Uttar Pradesh, India

#### ABSTRACT:

**Background**:Acne Vulgaris stands out as the prevailing skin disorder involving the pilosebaceous unit, marked by an overproduction of sebum, heightened follicular epidermal growth, inflammation, and the activity of Propionibacterium acnes. It impacts roughly 80% of teenagers, giving rise to substantial psychological and social repercussions, along with physical disability. The objective is to assess the prescription patterns and the underlying reasoning behind drug therapy for acne vulgaris.**Methods**:In this prospective, hospital-based, observational study, demographic information, disease-related data, and details concerning the drug therapy of the subjects were assessed, taking into account the specified inclusion and exclusion criteria.**Results**:Analysis was conducted on the prescription data of 173 patients, revealing that 40% were males with an average age of 21.94±0.3 years. Among the four grades of Acne Vulgaris, Grade II was the most prevalent at 56.17%, followed by Grade I (23.58%), Grade III (15.87%), and Grade IV (4.35%). A total of 128 topical drugs were prescribed, with the most common being Tretinoin alone (18.46%), a combination of Tretinoin and Clindamycin (16.12%), Benzoyl Peroxide (14.45%), and Clindamycin alone (10.51%). For systemic use, 49 drugs were prescribed, with Doxycycline (50.1%), Azithromycin (39.7%), Isotretinoin (8.12%), and Erythromycin (2.08%) being the primary choices.**Conclusion**:The majority of prescriptions demonstrated rationality, minimizing the likelihood of polypharmacy. **Keywords**:Acne Vulgaris, Dermatology, Rational prescription.

Received: 21-06-2019

Accepted: 26-07-2019

**Corresponding author:** Anup Goyal, Associate Professor, Department of Skin & VD, Venkateshwara Institute of Medical Sciences, Gajraula, Uttar Pradesh, India

**This article may be cited as:** Goyal A. Observing Prescription Trends for Acne Vulgaris Treatment: An Analytical Study of Drug Utilization. J Adv Med Dent Scie Res 2019;7(8):367-373.

#### INTRODUCTION

The skin, as the largest organ in the human body, serves as a dynamic interface with the external environment. Within its intricate layers, the skin forms a unique ecosystem colonized by a diverse array of microorganisms, including bacteria, viruses, and fungi. These microorganisms play a crucial role in maintaining the body's health by providing protection against the intrusion of harmful pathogens.<sup>1</sup>This symbiotic relationship between the host and the microorganisms creates a finely tuned balance within the skin, establishing it as a complex ecosystem. This delicate equilibrium involves both biological and physical components working in harmony. Any disturbance to this balance can result in various skin disorders or infections, underscoring the vulnerability of this vital organ to external and internal factors.Skin diseases, comprising approximately 14.4% of all medical disorders attended to by physicians, carry

significant implications for individuals. Beyond the physical discomfort they may cause, these conditions have a notable impact on the overall quality of life and psychosocial well-being of affected individuals. The visible nature of skin disorders often leads to selfesteem issues. social stigma. and emotional distress.Recognizing the multifaceted relationship between skin health and psychological well-being, the field of psychodermatology has evolved. This interdisciplinary field explores the intricate interplay between dermatological conditions and various psychological factors, aiming to enhance our understanding and approach to the holistic care of individuals with skin-related concerns. As research progresses, the insights gained from psychodermatology contribute to а more comprehensive and integrated approach to managing skin disorders, addressing not only the physical symptoms but also the emotional and psychological

aspects of the patient's well-being. Acne, a condition affecting the pilosebaceous unit, emerges as a prevalent challenge, impacting over 80% of the general population at some point in their lives. While traditionally considered an ailment of adolescence with a self-limiting nature, a noteworthy percentage of individuals grapple with this condition into adulthood. Clinical manifestations of acne encompass a spectrum of lesions, including comedones (a pathognomonic feature), inflammatory papules, pustules, nodules, and cysts. Predominantly affecting sebaceous gland-rich regions such as the face, neck, chest, back, and upper arms, acne extends beyond its clinical presentation.<sup>2</sup> Complications arise, including post-inflammatory hyperpigmentation and scarring, adding to the challenges faced by individuals with this condition. The impact of acne extends beyond the physical symptoms; it often leads to disfigurement, notably affecting visible areas of the body. This visible manifestation can significantly impair the quality of life for those affected. The consequences may include social impairment, loss of confidence, and even the onset of depression. In severe cases, individuals grappling with acne may experience heightened emotional distress, and in rare instances, it can contribute to the development of suicidal tendencies.Recognizing the multifaceted toll of acne, it becomes imperative to address not only the clinical severity but also the psychosocial aspects of the condition. Comprehensive care should involve not just the management of physical symptoms but also interventions that mitigate the emotional and psychological impact, fostering a holistic approach to improving the well-being of individuals dealing with acne.

Acne vulgaris stands out as the predominant skin disorder among adolescents, impacting over 70% of teenagers. Despite this high prevalence, advancements in treatment modalities have contributed to a decline in overall incidence. While acne itself is not linked to severe morbidity, mortality, or physical disability, its implications extend beyond the physiological realm, encompassing significant psychological and social consequences.3 The term "acne" originates from the Greek word 'acme,' denoting a point or spot. In ancient Greek, acne was referred to as 'tovoot,' signifying the initial growth of the beard. This historical association underscores the recognition of acne as a phenomenon intertwined with the transitional period of puberty. As such, the development of acne became intricately linked with the physiological changes and hormonal fluctuations characteristic of adolescence. Although acne may not pose a direct threat to physical health, its impact on mental well-being and social dynamics is noteworthy. The visible nature of acne, often manifesting as facial blemishes, can influence self-esteem and body image, particularly during a phase of life marked by heightened sensitivity to appearance and social acceptance. Therefore, addressing the psychosocial

dimensions of acne is an integral aspect of comprehensive care, acknowledging its potential to affect the holistic well-being of individuals navigating this common yet impactful skin condition. The treatment approach for acne vulgaris encompasses a combination of topical and systemic interventions. Topical agents, including Retinoids, Benzoyl Peroxide, and Clindamycin, play a crucial role in reducing follicular obstruction and preventing resistance to Propionibacterium. Systemic antibiotics such as Doxycycline, Erythromycin, and Azithromycin are employed to address acne at a broader level.For severe, recalcitrant nodular acne, oral Isotretinoin represents a potent therapeutic option. However, caution is paramount, especially in female patients of childbearing age, due to its teratogenic properties.Hormonal agents, such as Estrogen-containing oral contraceptives, and oral antiandrogens like Spironolactone, Cyproterone acetate, and Flutamide, have demonstrated efficacy in acne management. These agents work by modulating hormonal imbalances that contribute to acne development.Beyond conventional pharmaceutical approaches, various miscellaneous therapies come into play.<sup>4</sup> These include acupuncture, dietary modifications with a focus on avoiding highglycemic-index foods, intralesional corticosteroid injections, peeling agents like Glycolic acid and acid. comedone Salicylic removal, microdermabrasion, and the utilization of natural products like Tea tree oil and other medicinal plant derivatives. This comprehensive array of treatment options highlights the nuanced and individualized nature of acne management, where a combination of therapeutic modalities may be tailored to the specific needs and characteristics of each patient.Regularly auditing prescriptions is a crucial practice to ensure that the medications prescribed to patients are rational, minimizing unnecessary financial burdens and potential side effects.<sup>5</sup> This process is integral to the broader concept of medical audit, specifically within the realm of studying prescribing patterns. The study of prescribing patterns involves ongoing monitoring, evaluation, and the identification of opportunities for modifying prescribing practices. The overarching goal is to enhance the rationality and cost-effectiveness of medical care. By systematically reviewing prescription practices, healthcare providers can identify trends, potential areas for improvement, and implement changes that optimize patient outcomes while also considering economic factors.In essence, periodic auditing of prescriptions serves as a proactive measure to uphold the principles of evidence-based and efficient healthcare delivery.<sup>6</sup> It aligns with the broader objective of continuously improving the quality of medical care, ensuring that treatments are not only clinically sound but also mindful of the economic implications and the overall well-being of the patients.

#### MATERIALS AND METHODS

In the realm of scientific inquiry, a comprehensive and methodical research endeavor took shape through a prospective cross-sectional, observational, and descriptive epidemiological study. This investigation spanned a significant timeframe, extending over the course of one year, allowing for a thorough exploration of the subject matter.Prior to delving into the research, due diligence was observed by seeking and obtaining approval from the institutional research and ethical committee. This pivotal step exemplifies a commitment to conducting research in accordance with ethical standards, safeguarding the well-being and rights of the participants, and ensuring the credibility and integrity of the study.Crucially, the study prioritized the ethical principle of informed consent. Before any data collection commenced, provided participating subjects were with comprehensive information about the study's objectives, procedures, and potential implications. Informed and written consent was then obtained from each participant, emphasizing the voluntary nature of their involvement. This transparent and ethical approach not only upholds the rights and autonomy of the individuals involved but also contributes to the overall reliability and credibility of the study's findings.In essence, this meticulous research design, coupled with ethical considerations such as committee approval and informed consent, establishes a robust foundation for the study. It reflects a commitment to conducting research that is not only scientifically rigorous but also ethically responsible, ensuring the highest standards of integrity in the pursuit of knowledge.

In delineating the parameters for participant selection, the study's inclusion criteria aimed to capture a broad yet specific demographic. Patients aged 12 years or older, representing both genders, were considered eligible for inclusion. The selection of individuals reporting to the Outpatient Department of Dermatology ensured that the study drew from a clinically relevant population seeking dermatological care. The diagnostic criteria, categorized into Acne Vulgaris Grade I to Grade IV, provided a nuanced understanding of the severity spectrum. Grade I encompassed individuals with comedones and occasional papules, while Grade II included papules, comedones, and a few pustules. Moving up the severity scale, Grade III involved predominant pustules with nodules and abscesses, and Grade IV represented the most severe form characterized by cysts, abscesses, and widespread scarring.On the flip side, exclusion criteria were meticulously outlined to maintain the study's integrity and ethical standards.<sup>7</sup> Patients demonstrating hypersensitivity to antibiotics were excluded to mitigate potential adverse reactions. Pregnant and lactating women were omitted due to the unique physiological considerations during these periods. Additionally, individuals with drug-induced acne were excluded to ensure a focused examination of intrinsic factors influencing Acne Vulgaris.

In establishing these criteria, the study sought to strike a balance between inclusivity and specificity, thereby refining the cohort to individuals most relevant to the research objectives. By implementing these criteria, the study aimed to enhance the internal validity and generalizability of its findings, providing a solid foundation for meaningful and applicable results.

#### RESULTS

Over a span of 12 months, a comprehensive screening process was conducted on 173 prescriptions intended for patients diagnosed with Acne Vulgaris at the Outpatient Department. This meticulous screening adhered to the predefined Inclusion and Exclusion criteria, ensuring a focused and relevant dataset for analysis. Among the total patient cohort, 78 individuals (40.1%) identified as males, while 95 individuals (59.9%) were females, reflecting a balanced representation across genders.<sup>8</sup>The collective demographic portrait of these patients revealed an average age of 21.94±5.3 years, underscoring the prevalence of Acne Vulgaris across a broad spectrum of age groups. Further stratification based on the severity of Acne Vulgaris, as per the four defined grades, illuminated notable patterns. Grade II emerged as the most frequently reported grade, with 92 patients (56.17%) falling into this category. Following this, Grade I accounted for 46 patients (23.58%), and Grade III was observed in 24 patients (15.87%). These findings, succinctly summarized in Table 1, provide a comprehensive snapshot of the demographic and clinical characteristics of the studied population, setting the stage for in-depth analysis and insights into the patterns of Acne Vulgaris and its therapeutic management in the outpatient setting.

 Table 1: Prevalence of the four grades of AcneVulgaris among the patients

Grade of acne vulgaris	Males(n)	Females(n)
Ι	17	29
II	42	50
III	10	14
IV	9	2
Total	78	95

Number of drugs	Number of prescriptions
1	71
2	73
3	27
4	2
Total	173

Table 2: Frequency of the drugs prescribedper patient





Figure 2: Frequency of the most commonly prescribed drugs for topical use



Among the 173 prescriptions analyzed, a total of 306 drugs were prescribed. The range of drugs per patient varied from 1 to 4, with an average of 1.77 drugs per prescription. Notably, 42.2% of patients, totaling 73 individuals, were prescribed 2 drugs per prescription.

Additionally, 26.6% of patients (71 individuals) received monotherapy.

Within the 306 drugs prescribed across 173 prescriptions, 82 (26.8%) constituted Fixed Dose Combinations (FDCs). Notably, the most frequently prescribed FDC was a blend of Tretinoin and

Clindamycin, accounting for 53.66% of these combinations (44 prescriptions). Following closely were combinations of Benzoyl Peroxide and

Adapalene, representing 24.4% (20 prescriptions), and Benzoyl Peroxide and Clindamycin, comprising 15.85% (13 prescriptions)



Figure 3: Number of fixed dose combinations used in the treatment of acne vulgaris

#### DISCUSSION

The exploration of prescription patterns stands as a pivotal methodology in the comprehensive assessment of the quality of patient care within any healthcare system.9 By scrutinizing the intricacies of how medications are prescribed, a profound understanding of the therapeutic approaches and healthcare practices emerges. This particular study was initiated with the specific objective of delving into the prescription patterns relevant to the drug therapy applied in the management of Acne Vulgaris. Acne Vulgaris, a common skin condition, necessitates a thoughtful and tailored approach to drug prescription to ensure patient-centric care.Through effective and а meticulous examination of the prescriptions issued for Acne Vulgaris, this research seeks to unravel the prevailing trends, preferences, and variations in the pharmacotherapeutic strategies employed by healthcare professionals.<sup>10</sup> The insights derived from this study are poised to contribute significantly to the enhancement of patient care protocols, fostering decision-making informed among healthcare practitioners, and ultimately elevating the overall standards of dermatological healthcare for individuals grappling with Acne Vulgaris.

Within the cohort of 173 patients, the gender distribution revealed 78 males (45.1%) and 95 females (54.9%), establishing a Male:Female ratio of 1:1.21. The average age of the patients was determined to be  $21.94\pm5.3$  years.<sup>11</sup> This demographic profile contrasts with the observations of Santosh Kumar et al, whose study reported a Male:Female ratio of 1:1.07, with a mean age group of  $21.67\pm0.51$  years. These variations in gender distribution and age averages underscore the importance of considering

demographic factors in the context of the study, shedding light on potential differences in the population under investigation.

The recommendations put forth by the American Academy of Dermatologists offer comprehensive guidelines for the judicious use of oral antibiotics in the management of acne. According to their guidance, oral antibiotics are deemed most appropriate for cases moderate presenting with to severe acne manifestations, where the severity of the condition warrants a systemic approach to treatment.<sup>12</sup> Additionally, they advocate for the consideration of oral antibiotics in instances where standard treatments for inflammatory acne prove to be ineffective, underscoring the need for a tailored and escalated approach in challenging cases. The distinction between minocycline and doxycycline, as highlighted by the Academy, adds a layer of specificity to the prescription choice. The recommendation that minocycline is superior to doxycycline in reducing Propionibacterium acnes emphasizes the nuanced decision-making process involved in selecting the most effective antibiotic regimen tailored to individual patient needs.Furthermore, the guidelines articulated by the expert committee in 2006 echo the cautious stance on oral antibiotics.<sup>13,14</sup> The committee recommends restricting the use of oral antibiotics to cases falling within the moderate to severe acne spectrum. Importantly, they caution against relying on oral antibiotics as a monotherapy, signaling the importance of combining these medications judiciously with other treatment modalities. This holistic and nuanced approach to acne management underscores the commitment to optimizing therapeutic outcomes while minimizing the risk of antibiotic

resistance and other potential adverse effects associated with their use.

In the present study, a noteworthy observation is that a substantial majority, accounting for 98.7% of the prescribed drugs, were identified and administered by their brand names. It is interesting to note that, in contrast, some other studies have consistently reported a 100% utilization of brand names in drug prescriptions. Furthermore, among the patient cohorts, 71 individuals (41.04%) were recipients of monotherapy, while 102 patients (58.96%) were subjected to polytherapy.<sup>15</sup> The prevalence of Fixed Dose Combinations (FDCs) stood at 82 cases, constituting 26.79% of the total drug regimens.In contrast to these findings, certain authors reported a significantly lower incidence of monotherapy (6.2%) in their study, with the majority of patients (93.8%) receiving polytherapy. Additionally, a striking difference emerged in the prevalence of Fixed Dose Combinations when compared to a study conducted by Santosh et al, where only 3.08% of the prescriptions included FDCs, showcasing а considerable disparity. It is pertinent to underscore that the rationale behind employing Fixed Dose Combinations lies in their development based on rational pharmacokinetic and pharmacodynamic criteria. The objective is to achieve a synergistic therapeutic effect without introducing any supraadditive toxic outcomes.<sup>16</sup> Moreover, the convenience offered by Fixed Dose Combinations enhances patient compliance, which can be a critical factor in optimizing treatment outcomes. The observed variations between this study and previous research highlight the diversity in prescription practices and importance of underscore the contextual considerations and evolving medical perspectives in shaping treatment approaches for optimal patient care. Within the ambit of the current study encompassing 173 prescriptions and involving a scrutiny of 302 drugs, a predominant focus was observed on topical applications.<sup>17</sup> Specifically, 257 drugs, constituting 83.99% of the total, were designated for topical use. In contrast, systemic applications accounted for 49 drugs, representing 16.01% of the total therapeutic regimen.Interestingly, this distribution diverges from the percentages reported by other authors. According to their findings, the usage pattern leaned towards a more balanced approach, with 52.56% of drugs allocated for topical application and 47.44% for systemic use.<sup>18</sup> This incongruity underscores the variability in prescription preferences and treatment strategies across different studies, suggesting the potential influence of contextual factors, evolving medical paradigms, and individualized patient considerations in shaping therapeutic decisions. The observed disparities in the distribution of drugs for topical versus systemic use emphasize the dynamic nature of medical practice and the need for continual assessment and adaptation of treatment approaches to

align with the evolving landscape of healthcare and patient needs.

#### CONCLUSION

Acne Vulgaris, as one of the most prevalent dermatological conditions, significantly impacts individuals' quality of life and psychosocial wellbeing. Recognizing the imperative to ensure the judicious use of medications and to enhance the overall patient care framework, the current study was initiated to meticulously document and analyze the prescribing patterns adopted by dermatologists in the treatment of Acne Vulgaris.Our investigation reveals that the therapeutic interventions employed in the management of Acne Vulgaris were largely grounded in clinical expertise and empirical approaches. Dermatologists, drawing upon their extensive clinical knowledge and experience, tailored treatments to individual patient needs. This approach, while empirical, was marked by a rational foundation aligning with the current body of literature available on Acne Vulgaris. The study sheds light on the dynamic nature of acne treatment strategies, emphasizing the importance of a personalized and evidence-informed approach. As concerns about drug utilization and the need for prescription audits continue to grow, this research contributes valuable insights into the prevailing patterns of care, paving the way for ongoing improvements in patient outcomes and the optimization of acne management protocols.

#### REFERENCES

- 1. The skin microbiome. Nat Rev Microbiol. 2013;9(4):244-53.
- Verhoeven EWM, Kraaimaat FW, Weel C Van, Duller P, Hoogen HJM Van Den, Schers HJ, et al. Skin diseases in family medicine. Prevalence and health care use. Ann Fam Med. 2008;6(4):349-54.
- Barankin B, DeKoven J. Psychosocial effect of common skin diseases. Can Fam Physician. 2002;48:712-6.
- 4. Purdy S, Langston J, Tait L. Presentation and management of acne in primary care: a retrospective cohort study. Br J Gen Pract. 2003;53(492):525-9.
- Jones-Caballero M, Chren MM, Soler B, Pedrosa E, Penas PF. Quality of life in mild to moderate acne: Relationship to clinical severity and factors influencing change with treatment. JEADV. 2007;21:219-26.
- 6. Purdy S, de Berker D. Acne. BMJ. 2006;333(7575):949-53.
- 7. Na JI, Suh DH. Red light phototherapy alone is effective for acne vulgaris: randomized, single-blinded clinical trial. Dermatol Surg. 2007;33(10):1228-33; discussion 1233.
- Ramli R, Malik AS, Hani AFM, Jamil A. Acne analysis, grading and computational assessment methods: An overview. Ski Res Technol.2012;18(1):1-14.
- 9. Thappa D, Adityan B, Kumari R. Scoring systems in acne vulgaris. Indian J Dermatol Venereol Leprol.2009;75(3):323.
- 10. Hp L, Acad A, Wj C, Sc B, Jb L, Wj C, et al. Acne Global Severity Scale. 2002.

- Tan J. Current Measures for the Evaluation of Acne Severity. Expert Reviews Dermatology. 2008;3(5):595-603.
- Purdy S, Deberker D. Acne vulgaris Search date June2007 Skin disorders Acne vulgaris. Clin Evid (Online). 2008;05(1714):1-34.
- 13. Tunger O, Karakaya Y, Cetin CB, Dinc G, Borand H. Rational antibiotic use. J Infect Dev Ctries. 2009;3(2):88-93.
- Shankar PR, Upadhyay DK, Subish P, Dubey AK, Mishra P. Prescribing patterns among paediatric inpatients in a teaching hospital in western Nepal. Singapore Med J. 2006;47(4):261-5.
- Potharaju HR, Kabra SG. Prescription audit of outpatient attendees of secondary level government hospitals in Maharashtra. Indian J Pharmacol. 2011 Apr;43(2):150-6.
- Gautam CS, Saha L, Fixed Dose Drug Combinations (FDC's): rational or irrational: a view point, Br J Clin Pharmacol. 2007;65(5):795-6.
- Gautam CS, Aditya S, Irrational drug combinations: Need to Sensitise undergraduates: Ind J Pharmacol. 2006;38:167-70.
- Murray MD, Kroenke K. Polypharmacy and medication adherence: small steps on a long road. J Gen Intern Med. 2001;16:137-9.