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### A Prospective Observational Study of the prescribing patterns in Acne vulgaris in a Tertiary Care Hospital

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## Article Info

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**Abstract**

Acne vulgaris is a common skin condition seen in adolescence that can persist into adulthood. Although treatable, it can cause immense psychological and emotional distress to patients. Rational use of topical and systemic agents can enhance therapeutic benefits and decrease adverse effects. Prescription analysis helps in understanding drug usage trends to provide suitable feedback to practitioners. The objective was to study prescription patterns in acne vulgaris.

A prospective observational study was done for 9 months. Prescriptions were collected from the Dermatology OPD of a tertiary care teaching hospital, and the data was analysed using descriptive statistics. A total of 100 prescriptions were analysed. The average age of patients was 28 years and females outnumbered males. Most patients had Grade II acne (50 cases), followed by Grade I (25 cases), Grade III (22 cases) and Grade IV (3 cases). The total number of drugs prescribed was 240, with an average of **2.4** per prescription. 204 drugs were topical preparations, and 36 drugs were given for systemic use. Retinoids, given singly, or in combination, were the most commonly prescribed topical drugs (27% of topical drugs). Doxycycline was the most frequently prescribed oral antibiotic. Only 1 patient was given oral isotretinoin. 37% of the drugs were given as fixed dose combinations, the most common was adapalene+clindamycin (23%), followed by azelaic acid +benzoyl peroxide (7.8%). Rational prescribing is crucial to optimizing acne vulgaris treatment outcomes and our study showed rational and judicious use of drugs for acne management.

**Key Words:** Acne vulgaris, grades of acne, oral medications, Prescription patterns, topical preparations.

**INTRODUCTION**

Acne vulgaris is a chronic inflammatory disorder of the skin affecting the pilosebaceous unit. It is characterized by increased sebum production, hormonal (androgen) influences, hyperkeratinization of follicles and colonization by *Propionibacterium acnes*. Lesions associated with acne include non-inflammatory comedones, which may be open (black heads) or closed (white heads), inflammatory papules, pustules, nodules and cysts. If left untreated, they may lead to pigmentary changes and scarring. While acne is not a major source of morbidity or mortality, it has substantial psychosocial impact on patients, affecting their quality of life <sup>(1,2)</sup>.

Different grading systems have been developed for acne on the basis of clinical severity <sup>(3)</sup>.

The first grading system introduced by Pillsbury *et al*, is given below <sup>(3)</sup>. This grading is based on an overall estimate of the type of lesion, the number of lesions and the predominant lesion.

reference 16 of mine Pillsbury

Grade I: Comedones and occasional small cysts confined to the face

Grade II: Comedones with occasional pustules and small cysts confined to the face

Grade III: Many comedones and small and large inflammatory papules and pustules, more extensive but confined to the face

Grade IV: Many comedones and deep lesions tending to coalesce and canalize, and involving the face and the upper aspects of the trunk

In the present study we have used the Pillsbury grading system

Various categories of drugs for acne include benzoyl peroxide, antibiotics (topical or oral), retinoids (topical or oral), anti-seborrheic medications, anti-androgen medications, hormonal treatments, salicylic acid, alpha hydroxy acid, azelaic acid, nicotinamide and keratolytic soaps. Mild acne is treated with topical medications. Moderate and severe acne can be treated with stronger medications, including oral agents. Antibiotics target certain types of skin bacteria and hormonal treatments reduce sebum production. Hormonal agents are available in topical (clascoterone) and oral (spironolactone, certain birth control pills) forms. Oral retinoids (isotretinoin) are reserved for the most severe and treatment-resistant forms of acne. Gentle skin cleansers, noncomedogenic (non-pore blocking) skin care products, and avoidance of skin scrubbing and picking are also recommended for the management of acne <sup>(4)</sup>.

Careful prescription of drugs in disease management is essential for optimal therapeutic outcomes while minimizing side effects. However, irrational prescribing is a worldwide problem that may not only be ineffective, but also cause unnecessary burden to the patient in terms of side effects or cost <sup>(5)</sup>. The present study aims to assess the prescribing trends in acne vulgaris in a tertiary care teaching hospital.

### Materials and Methods

A prospective observational study was conducted for a period of 9 months from July 2022 to March 2023. After obtaining approval of the Institutional Ethics Committee, prescriptions for acne vulgaris in patients of all age groups of either gender were collected on a specially designed proforma from the outpatient department of Dermatology in a tertiary care teaching hospital. Patients with drug-induced acne, and pregnant & lactating women were excluded from the study. The proforma included the demographic profile of the patient, such as name, age, sex and address; details of the disease where the lesions were described and graded; and drug treatment data including names of the drugs with dose, route, formulations, frequency and duration of administration for each drug.

The data was analysed using descriptive statistics.

### Results

A total of 100 prescriptions of acne vulgaris were studied. Patients were in the age range of 12 years to 44 years (mean age - 28years). 70 patients were in the age group of 16-30 years.

**Table1. Age distribution of Acne**

Age distribution(yrs)	No of patients
10-15	12
16-20	16
21-25	27
26-30	27
31-35	8
36-40	4
41-45	6

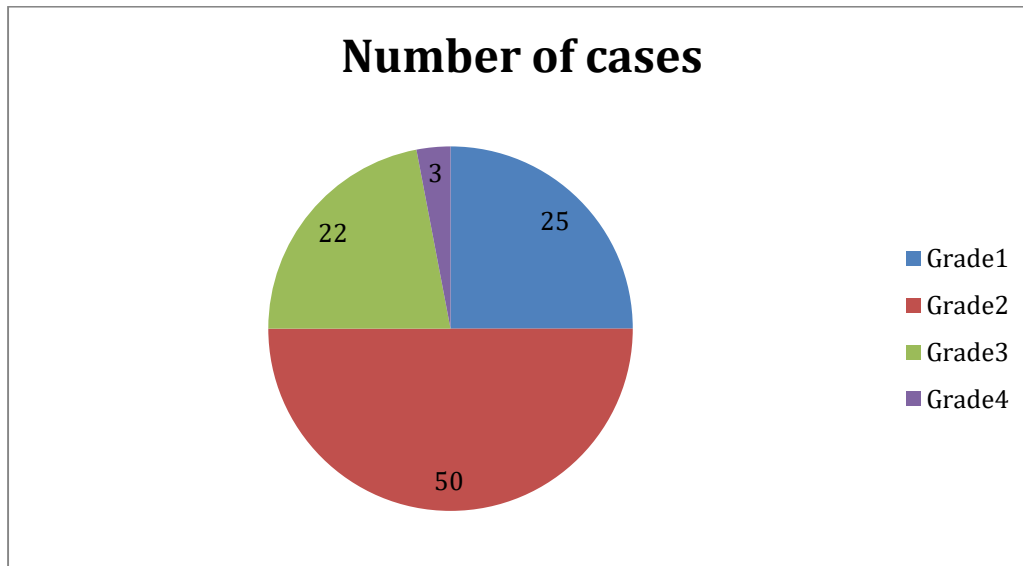
The maximum number of cases were in the age group of 21-30 years ( 54 cases).

### Gender distribution

There were a total of 38 male and 62 female patients of acne in the study .

### Grades of acne vulgaris – prevalence

25 patients had Grade I acne vulgaris, 50 cases showed Grade II, Grade III acne was seen in 22 patients and 3 patients presented with Grade IV acne.



**Fig.1 : Grades of acne vulgaris – prevalence**

### Prescriptions and drugs

The total number of drugs prescribed for 100 prescriptions was 240. The number of drugs per prescription ranged from 1- 4, the average number of drugs per patient being 2.4 . Monotherapy was seen in 7 prescriptions , while 54 patients received 2 drugs per prescription,32 received 3 drugs in their prescription and six patients received 4 drugs in their prescription while 1 patient received 5 drugs .

Out of 240 drugs, 204 (85%) were topical preparations, and 36 (15%) were given for systemic (oral) use. Retinoids (either as monotherapy or in combination with other drugs) were the most commonly prescribed topical drugs (63 prescriptions, 30.8%).Tretinoin as monotherapy was seen in 8 prescriptions (4%). 47prescriptions (23%) were of a combination of adapalene +clindamycin, the other combination being adapalene + benzoyl peroxide, constituting 8 prescriptions (4%). Facewash was also prescribed to 34 patients (16.7%), which predominantly contained salicylic acid, glycolic acid, aloe vera and vitamin E. Among topical antimicrobial agents, 72 (35.3%) and 32 (15.7%) prescriptions were of clindamycin and benzoyl peroxiderespectively, either singly or in combination with other agents.Othertopical antimicrobials were metronidazole and dapsone, each prescribed to 1 patient (0.5%). One prescription (0.5%) contained topical miconazole.

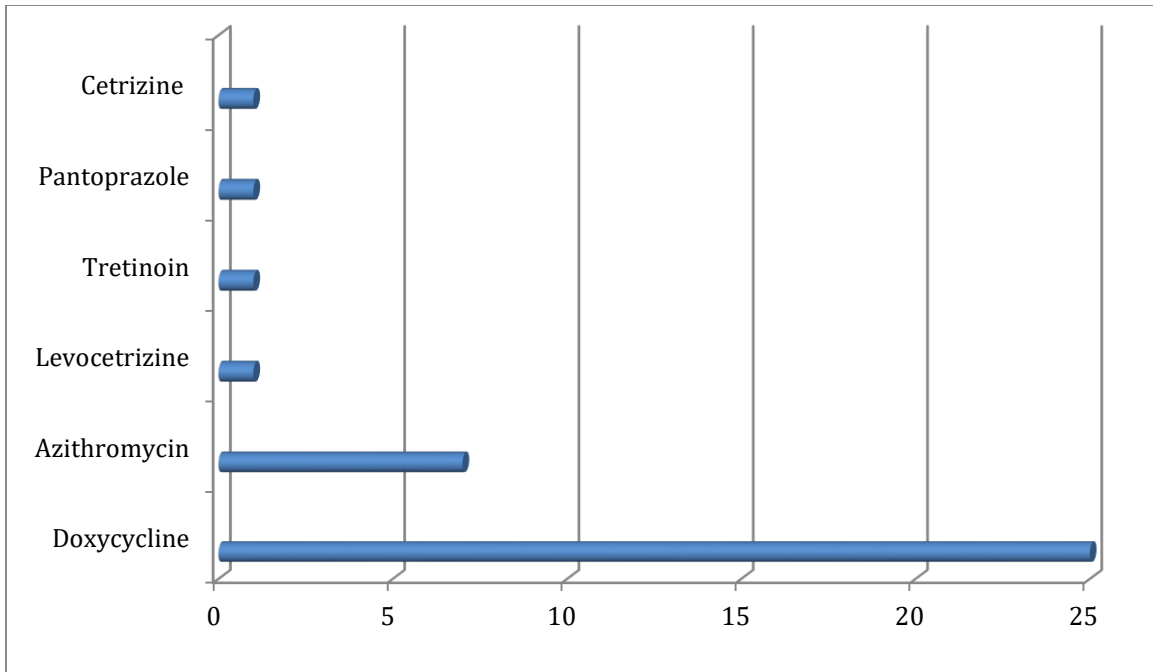
**Table 2 : Topical preparations prescribed**

<b>Drugs</b>	<b>No of prescriptions</b>	<b>Percentage</b>
Adapalene+Clindamycin	47	23
Adapalene + Benzoyl Peroxide	8	4
Clindamycin + nicotinamide	9	4.4
Soaps	20	10
Clindamycin	10	5
Face wash	34	16.7
Tretinoin	8	4
Clindamycin +BPO	6	3
Azelaic acid	6	3
Sunscreen	13	6.3
Moisturiser	26	12.7
Azelaic acid +BPO	16	7.8
Benzoyl Peroxide	2	1
Ketoconazole + salicylic acid	2	1
Metronidazole	1	0.5
Miconazole	1	0.5
Dapsone	1	0.5

***Drugs for Systemic Use***

Out of the systemically administered agents, 32( 89%) were antibiotics. Doxycycline was most commonly prescribed (25 patients), followed by azithromycin (7 patients) and levocetirizine and cetirizine (1 patient each). Only 1 patient received oral tretinoin. One patient received Pantoprazole by the oral route .

**Systemic antibiotics and other drugs**

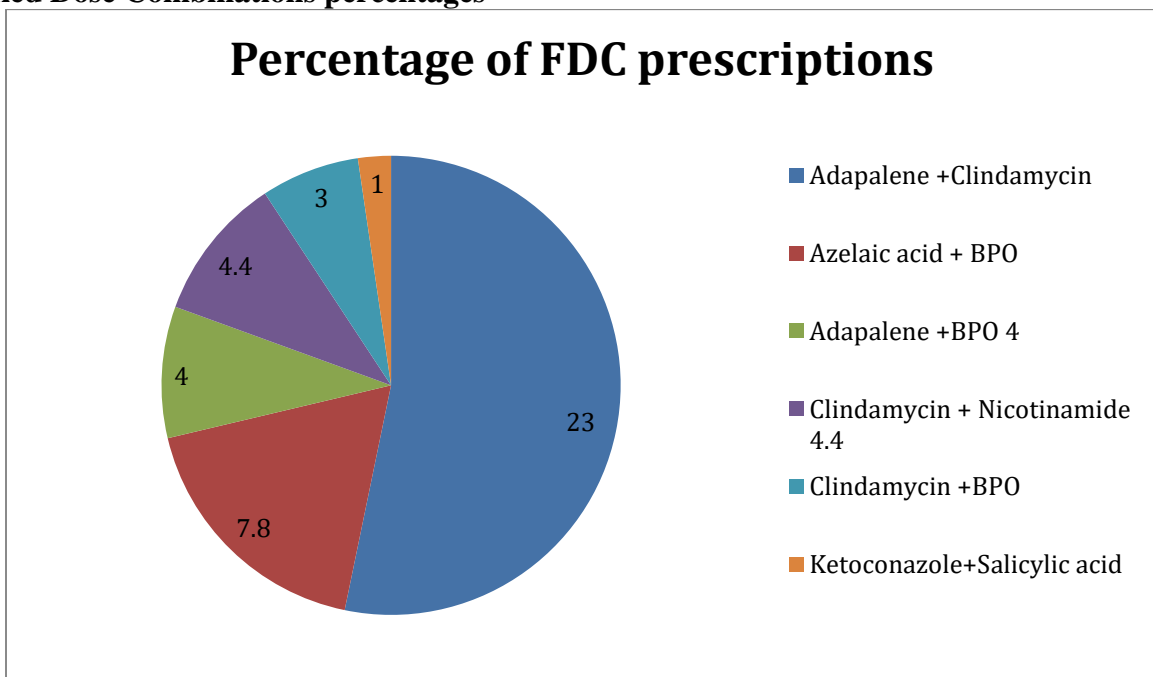


**Fig.3 : Systemic drugs used**

**Fixed dose combinations**

Out of the total number of 240 drugs prescribed, the number of fixed dose combinations (FDC) was 88(37 %). The most common was topical adapalene+Clindamycin (47patients), followed by Azelaic acid + Benzoyl peroxide ( 16 patients). None of the systemic drugs were administered as an FDC.

**Fixed Dose Combinations percentages**



98.8% of drugs were prescribed by brand names. Only 1 drug was prescribed in its generic name.

Number of cases

**Table 3: Topical Medications prescribed for each grade of acne ( Important drugs)**

Topical Drugs	Grade 1	Grade 2	Grade 3	Grade 4	Total number
Adapalene +BPO	1	4	3	0	8
Adapalene + Clindamycin	5	29	11	2	47
Azelaic acid	4	2	0	0	6
Azelaic acid + BPO	8	6	1	1	16
BPO	1	4	1	0	6
Clindamycin	4	5	1	0	10
Clindamycin + Nicotinamide	3	4	2	0	9
Facewash	7	19	7	1	34
Moisturiser	6	12	6	1	25
Sunscreen	1	7	4	1	13
Tretinoin	2	3	1	2	8

**Table 4 : Oral medications prescribed for each grade**

Oral drugs	Grade 1	Grade 2	Grade 3	Grade 4	Total number of cases
Azithromycin	1	4	2	0	7
Cetirizine	0	1	1	0	2
Doxycycline	1	11	11	2	25
Tretinoin	0	1	0	0	1

## Discussion

Acne is common in adolescence, affecting about 85% of teenagers. Acne is now seen to present earlier and last longer <sup>(6)</sup>. Although hormonal changes in teenage and early adulthood play a prominent part in the development of acne, it may continue to affect individuals beyond this age. <sup>(10)</sup>In congruence with this, majority of the patients which is 70% in our study were in the age group of 16-30 years. patients ,12% were in the age group of 10-15 years and 18% were in the age group of 31-45 years. The average age of the patients in our study was 28years, which is higher compared to earlier studies where the average age was around 22years <sup>(2,5,6)</sup>.

The number of females was 1.6 times the number of males in our study and in all the grades also there was female preponderance except grade IV. In concurrence with other studies <sup>(2,7,8)</sup>, Grade II acne vulgaris was the most prevalent in our study (50cases), followed by Grade I (25 cases), Grade III (22 cases) and Grade IV(3 cases). Genetic factors are implicated in the pathogenesis of acne in adult women. They affect the number, size and activity of sebaceous glands, mediate the action of hormones and promote follicular keratinization<sup>(9)</sup>.

The number of drugs per prescription ranged from 1-4, with an average of 2.4, while previous studies have shown values of 1.77, 2.41, 3.36 and 4.76 respectively <sup>(2,5,10,11)</sup>. Monotherapy was seen in 7 patients (7.8%) and 54 prescriptions (50%) contained 2 drugs. Keeping the number of drugs to a minimum is beneficial in terms of lesser adverse drug reactions, drug interactions and cost to the patient.

Topical therapy is the mainstay of treatment for mild to moderate acne. <sup>(1)</sup> Topical retinoids are recommended as monotherapy when acne is mainly comedonal. They are to be used in combination with topical or oral antimicrobials in patients with mixed or primarily inflammatory acne lesions <sup>(12)</sup>. These prescribing trends were observed in our study. Out of the total number of 240 drugs prescribed, 204 drugs (85%) were topical formulations and 36 drugs (15%) were for systemic (oral) use. A similar pattern was observed by Pooja *et al* <sup>(2)</sup>, but other authors <sup>(5,9)</sup> have reported relatively higher percentages of systemic drug use (40.02% & 47.446% respectively).

In Gupta *et al* study, 67 drugs were prescribed by topical route while 33% drugs were prescribed by oral route. <sup>6</sup> Retinoids were the most commonly prescribed topical drugs in our study (55 prescriptions, 27%). This is not in concurrence with earlier studies where benzoyl peroxide <sup>(2)</sup> and clindamycin <sup>(10)</sup> were common topical agents used. In our study, for monotherapy, the drugs used were Azelaic acid, Clindamycin, Benzoyl peroxide and tretinoin, the combinations used were adapalene+clindamycin, adapalene+BPO, azelaic acid and Clindamycin, azelaic acid and BPO, clindamycin and BPO, salicylic acid and ketoconazole, both BPO and clindamycin having antimicrobial effects in acne, which is in accordance with the recommended guidelines <sup>(12,13)</sup>.

The most commonly used topical preparations were adapalene + clindamycin (47 prescriptions), and facewash, both together of which featured in 34 prescriptions (16.7%). The main ingredients of the facewash included salicylic acid for its keratolytic properties, glycolic acid as an exfoliating agent, aloe vera as a soothing and moisturizing agent, and vitamin E for its antioxidant effect <sup>(13)</sup>. Azelaic acid has been recommended as first line therapy for mild acne in the European S3 guidelines. In the UK NICE guidelines it has been recommended along with oral antibiotics for moderate to severe acne. <sup>(14)</sup>

14.2% and 32.3% of patients received topical benzoyl peroxide and clindamycin respectively. Topical antimicrobials are not recommended as monotherapy in acne, for fear of development of resistance. 15 All our prescriptions were in alignment with this recommendation.

Doxycycline was the most commonly prescribed oral antibiotic (26 patients), followed by azithromycin (6 patients), which is consistent with three studies <sup>(2,9,11)</sup>. Azithromycin was most commonly prescribed in other studies <sup>(6,7)</sup>. Our prescriptions conform to the recommendations of The American Academy of Dermatologists to limit the use of oral azithromycin to patients who cannot use tetracyclines <sup>(15)</sup>.

Topical miconazole was prescribed to 1 patient. Acne vulgaris can coexist with pityrosporum folliculitis, and antimicrobials prescribed for acne can alter the normal bacterial flora and worsen this condition <sup>(16)</sup>. Antifungals have also been part of acne prescriptions in earlier studies <sup>(6,9)</sup>.

Topical dapsone has been approved by the U.S. Food and Drug Administration for the treatment of acne vulgaris which has not responded to traditional therapies. <sup>(17)</sup> Topical dapsone was prescribed to 1 patient of grade 2 acne. Dapsone 5% gel was used in several studies for the treatment of acne and has been recommended. <sup>(18)</sup>



1 patient of grade II acne received oral isotretinoin in our study. Although oral isotretinoin is approved only for the treatment of Grade IV acne, it is useful in lesser degrees of acne that are treatment resistant or produce either physical or psychological scarring (19). Oral retinoid given to this patient shows an inclination towards better management by preventing complications.

There were 88 (37%) fixed dose combinations (FDC) in our prescriptions. Pooja et al(2) reported FDC of 26.8%, while other studies reported FDC of 3.08% (5) and 31% (6). Fixed dose combinations are convenient, may help to reduce cost and improve patient compliance, given the chronicity of acne and the multi-modality approach to its management (5). Adapalene +Clindamycin constituted 23% of the FDC.

In Kamerkar study, topical clindamycin was most common administered in 48.4% patients, adapalene in 26.56%, and salicylic acid in 15.6%.<sup>(20)</sup>

In the present study, 98.8% of drugs were prescribed by brand names. Similarly, use of brand names was reported as, 98.7% by Pooja *et al*,<sup>(2)</sup>100% by Santosh *et al*,<sup>(5)</sup> 48% by Agarwal *et al* studies.<sup>(21)</sup>

## Conclusion

The present study provides a detailed analysis of the prescription patterns and treatment modalities utilized in acne vulgaris. Treatment approaches for acne should be holistic taking into account its medical as well as psychosocial aspects. Valuable information is gained by analysing prescription patterns, for their rationality and adherence to the recommended treatment guidelines. Topical medications contributed to 85% of the medications prescribed in our study which reduces the risk of systemic adverse effects. The feedback thus given to healthcare professionals can improve patient care in terms of enhancing therapeutic benefits while minimizing side effects.

**Conflict of interest:** None declared

**Ethical Approval:** Taken from the Institutional Ethics Committee before the beginning of the study

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