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A Prospective Study On Prescription Patterns For Acne Vulgaris In A Tertiary Care Teaching Hospital

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Abstract:
Background*: Prescription pattern monitoring studies (PPMS) are essential for promoting the rationaluse of medicines (RUM), particularly in treating Acne Vulgaris (AV), a chronic skin disorder which is known to affect most adolescents and young adults. This objective of the study is to evaluate prescription patterns for the management of AV and assess the prevalence of multi-drug therapy. Acne, characterized by comedones, papules, pustules, and nodules, significantly impacts patients' quality of life and mentalhealth.*
Materials and Methods*: This study was designed to analyse the prescribing patterns for the treatment of Acne Vulgaris. In this prospective observational study, was conducted over a period of 6 months in a tertiary care teaching hospital with 50 patients in which 43 of them were confirmed to have Acne Vulgaris.*
Results*: The study revealed that Grade II acne was the most prevalent, followed by Grades III, I, and IV. The majority of patients (58%) were students, with an average age of 22.6 years. The mostcommonly prescribed drug therapies were triple-drug regimens (37%), followed by dual-drug regimens (35%). Doxycycline, in combination with benzoyl peroxide and adapalene, was frequently prescribed in both triple and dual therapies. A total of 126 drugs were prescribed, with an average of 2.93 drugs per prescription. Topical agents were predominantly used, alongside oral antibiotics and retinoids, to manage AV based on severity.*
Conclusion: *This study concludes that multi-drug therapy, especially topical treatment, is the cornerstone in managing AV, with the combination of oral antibiotics and retinoids improving overall outcomes. Proper evaluation of prescription patterns contributes to bettertreatment approaches and healthcare standards.*
Key Word: *Prescription Pattern Monitoring Studies, Acne Vulgaris, Benzoyl peroxide, Multi-drug therapy, Severity grading.*

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I. Introduction

Prescription Pattern Monitoring Studies (PPMS) are tools used to assess the prescribing, dispensing, and distribution of medicines, with the primary aim of promoting Rational Use of Medicines (RUM)[1]. Evaluating prescription patterns is crucial for enhancing patient care and serves as a measure of healthcare quality[2]. Acne Vulgaris (AV), commonly known as acne, is a chronic skin disease affecting the pilosebaceousunits. It is marked by non-inflammatory open or closed comedones and inflammatory papules, pustules, and nodules[3]. Acne primarily affects the forehead, cheeks, chest, and upper back, with increased androgen levels during puberty leading to higher sebum production[4]. According to the Global Burden of Disease Study, acne ranks as the eighth most frequent skin disease in the world with a prevalence of 9.38% across all ages[5]. Acne Vulgaris is frequently seen in adolescents and young adults, with prevalence ranging from 35% to over 90% among adolescents[6]. In boys, prevalence increases from 40% at age 12 to 95% by 16, while girls experience a rise from 61% to 83% in the same period[7].

Etiology of Acne Vulgaris: Acne arises from follicle blockage, hyperkeratinisation, formation of keratin plug, and increased production of sebum. Elevated androgens stimulate sebaceous glands with increased production of sebum. Environmental causes like humidity, sun exposure; Genetic factors like TNF-α, IL-1α; Diet- foods high glycemic index; Drugs like lithium and steroids; Hormonal imbalances during puberty, testosterone; Conditions such as PCOS; Stress and occupational conditions like cosmetics can lead to acne[8,9,10&11]

Clinical Features:
Noninflammatory lesions:
Blackheads: Open comedones caused by excess oil and dead skin cells blocking hair shafts.
Whiteheads: Closed comedones, small bumps formed when oil, bacteria, and dead skin cellsblock hair follicles.

Inflammatory lesions:
Papules: Small pink, non-pus-filled inflammatory bumps, <5mm in diameter.
Pustules: Pus-filled lesions, with white pimples surrounded by red, irritated skin.
Nodules: Larger inflammatory lesions >5 or 10mm, centered in the skin.
Cysts: Large, painful, pus-filled lesions that can lead to scarring[5&12]

Grading of Acne Vulgaris:
GRADE 1- Comedones and Occasional papules
GRADE 2- Papules, Comedones and Few pustules
GRADE 3- Predominant Pustules, Nodules and Abscess
GRADE 4- Cysts, Abscesses and Wide spread Scarring[13]

Management of Acne Vulgaris:
Pharmacological Management:
Topical therapy:
Topical retinoid: Topical retinoids (e.g., tretinoin, adapalene, tazarotene) are vitamin A derivatives that regulate gene expression and are the first-line treatment for mild to moderate acne vulgaris. Effective against comedones, inflammatory papules, and pustules, they may be used alone or with agents like benzoyl peroxide or antibiotics.[7&14]
Benzoyl peroxide: Benzoyl peroxide concentration ranging from 2.5% to 10% is a comedolytic, anti-inflammatory, and antibacterial agent ideal for treating inflammatory acne with papules, pustules, and cysts which has efficacy in treating comedonal acne.[15,16]
Topical Antibiotics: Clindamycin (1%) and erythromycin (2%) are the most common topically applied antibiotics for treating acne, with efficacy from their antibacterial and anti-inflammatory properties.
Topical Azelaic acid: Azelaic acid is a mild antibacterial, anti-inflammatory, and anticomedolytic agent applied topically in 15% or 20% formulations. It is typically used as analternative treatment for acne, especially for post-inflammatory hyperpigmentation.[17]
Salicylic acid: Salicylic acid is a keratolytic, comedolytic and bactericidal agent supplied in concentrations of 3%-6% for use on the face, chest and back. It opens obstructed pores, neutralizes bacteria and decreases diameter of open pores.[16]
Dapsone: Dapsone 5% or 7.5% gel has anti-inflammatory and antibacterial properties. It is used as an alternative/adjunct treatment for acne.[18]

Oral Therapy:
Oral Antibiotics: Antibiotics are first-line treatments for moderate to severe inflammatory acne unresponsive to topical therapy. Benzoyl peroxide or retinoids are recommended for maintenance therapy after systemic antibiotic treatment, reducing the inflammatory response by significantly lowering P. acnes bacteria in and around the follicle. Tetracycline antibiotics,such as tetracycline, doxycycline, and minocycline, are bacteriostatic and anti-inflammatory. Doxycycline is commonly prescribed at 100 mg twice daily. Oral azithromycin is a good alternative forthose intolerants to doxycycline, given at 500 mg thrice weekly for 12 weeks, with excellent patient compliance and fewer side effects.[16&19]
Oral Isotretinoin: Isotretinoin, a vitamin A derivative, is used to treat severe nodulocystic acne or acne resistant to other therapies. Systemically administered isotretinoin is a significantadvancement in acne therapy. Isotretinoin achieves completeor near-complete clearing of acne in nearly all patients, leading to prolonged remission and cure.[16]

Non pharmacological management (Procedural therapies):
In treating acne lesions, various methods have been employed, including manual extraction of comedones, intralesional infiltration with triamcinolone, and draining of cysts and abscesses. Therapiessuch as laser and light therapy, as well as photodynamic therapy, have also been utilized. Other modalities include chemical peels, skin microneedling, derma roller procedures, and ablative laser resurfacing.[7]

II. Material And Methods

This is a prospective observational study conducted in the department of Dermatology at Sri Balaji Medical College, Hospital and Research Institute, Renigunta, from August 2023 to February 2024.

Study Design: Prospective observational study

Study Location: This study was conducted in the department of Dermatology at Sri Balaji Medical College, Hospital & Research Institution-Renigunta, Tirupati.

Study Duration: August 2023 to February 2024.

Sample size: 43 patients.

Sample size calculation: In our study 50 samples were recruited. All patients were provided with detailed explanations regarding the benefits and risks associated with the study. As a result of exclusion criteria 4 members were excluded from the study, remaining 3 members have expressed their unwillingness to participate in the study. 43 subjects were completely participated in the study. No follow up of prescription was done.

Inclusion criteria:

- Patients having acne vulgaris and of more than 12yrs of age, irrespective of gender were included in the study.
- Subjects who are willing to participate in the study.

Exclusion criteria:

1. Patients presenting with other dermatological diseases with acne are excluded.
2. Subjects who are not willing to participate in the study.
3. Pregnancy and lactating mothers were excluded.
4. Patients having drug induced acne and acne form eruptions were excluded.

Procedure methodology

On daily basis patients who were came to Dermatology OPD with the complaints of acne vulgaris were screened. The information on prescription patterns for acne vulgaris was collected through direct observation of prescriptions using a specially designed patient proforma.

It includes demographic details of the patient, cutaneous examination, pre-existing skin conditions and medication history. Demographic information includes age, gender, location of acne.

Statistical analysis

The data collected in the proforma were tabulated in the Microsoft Excel 2401. Descriptive statistical analysis was used for demographic data and to assess the prescription pattern for Acne Vulgaris. The data was represented as numbers and percentage.

III. Result

A total of 50 subjects were screened, in which 4 subjects were excluded based on exclusion criteria as they were presented with drug induced acne and 3 subjects were expressed their unwillingness to participate in the study. A total of 43patients were recruited into the study based on inclusion criteria upon receival of ICF.

Gender: Out of 43 subjects 24 were female population and 19 were male population.

Age: We categorized the subjects to their age groups. The average age of the total study population is 22.6 years and the average age of female and male is found to be 23.5 and 21.6 years respectively. The p value was 0.23957. Out of 43 subjects, 18 (42%) of them were from age group of 21-25 years, followed by 14 (32%) from 16- 20 years, 5 (12%) from 26- 30 years, 5 (12%) from 31- 35 years and then finally 1 (2%) of age group 11-15 years.

Table no 1: Shows distribution of subjects based on their age group

S.no	Age Group (In years)	Male (N=19)	Female (N=24)	No. of subjects (N=43)	Percentage (%)	P Value
1	11-15	1	0	1	2	
2	16-20	8	6	14	32	
3	21-25	6	12	18	42	
4	26-30	2	3	5	12	0.23957
5	31-35	2	3	5	12	
	TOTAL	19	24	43	100	
	SD ±	5.187705	4.96947	5.093		

Personal Habits: We have assessed the personal habits of study subjects and found that 34(79%) were having no personal habits, 7(16%) were smoker, 2(5%) subjects were alcoholic.

Table no. 2: Shows distribution of subjects based on their personal habits

S. No	Habits	No. Of Subjects (N=43)	Percentage (%)
1	Alcoholic	2	5
2	Smoker	7	16
3	No Habits	34	79
	Total	43	100

Site Of Acne Vulgaris:

Out of 43 subjects, 21(49%) subjects presented with acne on forehead & cheeks, followed by 7(16%) subjects exhibited acne on forehead, cheeks & upper back, 5(12%) subjects exhibited acne on forehead, cheeks & chest, 5(12%) subjects exhibited acne on forehead, 3(7%) subjects exhibited acne on forehead, cheeks, chest & upper back, 1(2%) subject exhibited acne on cheeks, 1(2%) subject exhibited acne on cheeks & upper back.

Table no.3: Shows distribution of subjects based on their site of Acne Vulgaris

S. No	Site Of Acne Vulgaris	No. Of Subjects	Percentage (%)
1	Forehead	5	12
2	Forehead & Cheeks	21	49
3	Cheeks	1	2
4	Forehead, Cheeks &Upper Back	7	16
5	Cheeks &Upper Back	1	2
6	Forehead, Cheeks &Chest	5	12
7	Forehead, Cheeks, Chest &Upper Back	3	7
	Total	43	100

Severity:

Out of 43 subjects,17(39%) was diagnosed with grade 2, 15(35%) with grade 3, 9(21%) with grade 1, 2(5%) with grade 4 acne.

Table no.4: Shows distribution of subjects based on their severity (grading)

S.no	Grade Of Acne	Severity	No. Of Subjects	Percentage (%)
1	I	Mild	9	21
2	II	Moderate	17	39
3	III	Moderately -Severe	15	35
4	IV	Severe	2	5
	TOTAL		43	100

Drug Therapy:

In this study we categorised various types of drug therapy according to Prescription such as Dual therapy, Triple therapy and Quadruple therapy.Out of 43 subjects, 16(37%) were from Triple therapy followed by 15(35%) were Dual therapy and 12(28%) were Quadruple therapy.

Table no.5: Shows distribution of subjects based on their drug therapy

S. No	Type Of Drug Therapy	No. Of Subjects	Percentage (%)
1	Dual Therapy	15	35
2	Triple Therapy	16	37
3	Quadruple Therapy	12	28
	Total	43	100

Dual Drug Therapy:

Out of 43 study subjects,15 subjects were given dual drug therapy. Out of 15 subjects, 5(33%) were prescribed with Benzoyl peroxide+ Salicylic acid, 3(20%) were prescribed with Tab. Doxycycline & Glycolic acid cream,2(13%) were prescribed with Adapalene+ Cetaphil cleanser, 1(7%) were prescribed with Tab. Doxycycline & Clindamycin gel, 1(7%) were prescribed with Tab. Isotretinoin & Clindamycin gel, 1(7%) were prescribed with Tab. Doxycycline & Adapalene gel,1(7%) were prescribed with Benzoyl peroxide+ Cetaphil cleanser, 1(7%) were prescribed with Benzoyl peroxide+ Adapalene gel.

Table no.6: Shows distribution of subjects based on dual drug therapy.

S. No	Drug Therapy		No. Of Subjects	Percentage (%)
	Oral	Topical		
1.	Doxycycline 100mg	Clindamycin 1%	1	7
2	Isotretinoin 20mg	Clindamycin 1%	1	7
3	Doxycycline 100mg	Adapalene 0.1%	1	7

4	Doxycycline 100mg	Glycolic Acid 6%	3	20
5		Benzoyl Peroxide5%+Salicylic Acid 1%	5	33
6		Adapalene 0.1%+Cetaphil Cleanser	2	13
7		Benzoyl Peroxide 5% + Cetaphil Cleanser	1	7
8		Benzoyl Peroxide 5%+Adapalene Gel 0.1%	1	7
	TOTAL		15	100

Triple Drug Therapy:

Out of 43 study subjects,16 was given triple drug therapy. Out of 16 subjects, 9(56%) were prescribed with Tab. Doxycycline & Benzoyl peroxide+ Adapalene gel, 2(13%) were prescribed with Tab. Doxycycline & Clindamycin gel+ Cetaphil cleanser, 2(13%) were prescribed with Tab. Isotretinoin+ Tab. Azithromycin & Glycolic acid cream, 1(6%) were prescribed with Tab. Doxycycline & Clindamycin+ Salicylic acid cleanser, 1(6%) were prescribed with Benzoyl peroxide+ Adapalene gel+ Salicylic acid cleanser,1(6%) were prescribed with Tab. Isotretinoin+ Tab Azithromycin & Clindamycin gel.

Table no. 7: Shows distribution of subjects based on triple drug therapy

S. No	Drug Therapy		No. Of Subjects	Percentage (%)
	Oral	Topical		
1	Doxycycline 100mg	Benzoyl Peroxide 5%+Adapalene 0.1%	9	56
2	Doxycycline 100 Mg	Clindamycin 1%+ Salicylic Acid 1%	1	6
3	Doxycycline 100mg	Clindamycin 1%+Cetaphil	2	13
4	Isotretinoin 20 Mg+ Azithromycin 500 Mg	Glycolic Acid Cream 6%	2	13
5		Benzoyl Peroxide 5%+Adapalene 0.1%+Salicylic Acid Cleanser	1	6
6	Isotretinoin 20 Mg+ Azithromycin 500mg	Clindamycin 1%	1	6
	TOTAL		16	100

Quadruple Drug Therapy:

Out of 43 study subjects,12 were given quadruple drug therapy. Out of 12 subjects, 7(58%) were prescribed with Tab. Doxycycline & Benzoyl peroxide+ Adapalene gel+ clindamycin gel, 2(17%) were prescribed with Tab. Isotretinoin+ Tab Azithromycin & Benzoyl peroxide+ Adapalene gel, 1(8%) were prescribed with Tab. Doxycycline & Benzoyl peroxide+ Adapalene gel+ Salicylic acid cleanser, 1(8%) were prescribed with Tab. Doxycycline & Benzoyl peroxide+ Adapalene gel+ Cetaphil cleanser, 1(8%) were prescribed with Tab. Doxycycline & Benzoyl peroxide+ Adapalene gel+ Glycolic acid.

Table no. 8: Shows distribution of subjects based on quadruple drug therapy

S.no	Drug Therapy		No. Of Subjects	Percentage (%)
	Oral	Topical		
1	Doxycycline 100 Mg	Benzoyl Peroxide 5%+Adapalene 0.1%+Clindamycin 1%	7	58
2	Doxycycline 100 Mg	Benzoyl Peroxide 5%+Adapalene 0.1%+Salicylic Acid 1%	1	8
3	Doxycycline 100 Mg	Benzoyl Peroxide 5%+Adapalene 0.1%+Cetaphil	1	8
4	Doxycycline 100 Mg	Benzoyl Peroxide 5%+Adapalene 0.1%+Glycolic Acid 6%	1	8
5	Isotretinoin 20 Mg+ Azithromycin 500 Mg	Benzoyl Peroxide 5%+ Adapalene 0.1%	2	17
	Total		12	100

Analysis Of Prescriptions:

Table no 9: records analysis of prescription.

Number of prescriptions	43
Total no. of drugs prescribed	126
Total no. of drugs prescribed through oral route	38
Total no. of drugs prescribed through topical route	88
Average no. of drugs prescribed per prescription	2.930

We have evaluated the prescriptions of study subjects and found that a total number of 126 drugs were prescribed out of 43 prescriptions and the average number of drugs per prescription was found to be 2.930. Out of 126 drugs prescribed, 38 were oral and 88 were topical agents.

IV. Discussion

In our study we observed that Acne Vulgaris was more prevalent in females (56%) than in males (44%) and our results were supported by ***Vinay Sharma et al.,*** study, were 57% of females were affected with Acne Vulgaris.

We categorized the patients to their age groups and found no significant difference in both the groups with *p* value = 0.23957. The average age of the total study population is 22.6 years and the average age of female and male is found to be 23.5 and 21.6 years respectively. The onset of Acne vulgaris was significantly higher in the age group of 21-25 years i.e. 42% followed by the age group of 16-20 years i.e. 32%. In contrast ***Vishal Prakash Giri et al.,*** study, where they have reported 65% of study subjects were from the age group of 15-25 years.

We categorized various types of drug therapy according to prescription, in that most commonly prescribed drug therapy was Triple drug therapy i.e. 37% followed by dual drug therapy i.e. 35%. We have assessed that in triple drug therapy the most commonly prescribed drugs are tab. Doxycycline which is given in combination with benzoyl peroxide 5% + adapalene 0.1% gel i.e. 56%.

We have assessed that in dual drug therapy the most commonly prescribed drugs are benzoyl peroxide 5% + salicylic acid i.e. 33%. We have assessed that in quadruple drug therapy the most commonly prescribed drugs are tab. Doxycycline + benzoyl peroxide 5%+adapalene 0.1% +clindamycin gel i.e. 58%. We have evaluated the prescriptions of study subjects and found that a total number of 126 drugs were prescribed out of 43 prescriptions and the average number of drugs per prescription was found to be 2.930. Out of 126 drugs prescribed, 38 were oral and 88 were topical agents. Our results were supported by ***Nibedita Patro.,*** study where they found that a total number of 3634 drugs prescribed out of 1210 prescriptions 1910 were topical and 1724 were oral formulations.

V. Conclusion

One of the most prevalent skin conditions, Acne vulgaris is a serious problem because it affects patient's quality of life and psychological well- being. This research was carried out to study the management and evaluate prescription patterns for Acne Vulgaris. Based on results of our study, we concluded that the most commonly prescribed drugs are oral doxycycline which is given in combination with benzoyl peroxide 5% along with adapalene 0.1% where triple drug therapy was mostly preferred for treating Acne Vulgaris. Multi drug therapy is a common practice in treating AV patients. By evaluating prescribing patterns, we concluded that topical therapy is the mainstay in the management of Acne vulgaris based on Severity grading. Topical formulations which is given in combination with oral antibiotics and retinoids improves overall treatment outcome in acne patients.

References

[1]. Jain S Et Al, A Systematic Review Of Prescription Pattern Monitoring Studies And Their Effectiveness In Promoting Rational Use Of Medicines, Department Of Pharmacology,6(2), Page: 86,87, 2015.
[2]. S Shanmugapriya Et Al, Drug Prescription Pattern Of Outpatients In A Tertiary Care Teaching Hospital In Tamil Nadu, Department Of Pharmacology,9(3), 2018.
[3]. Vinay Sharma Et Al, Study Of Prescription Pattern For Acne Vulgaris In Dermatology OPD In Tertiary Care Teaching Hospital, International Journal Of Medical Research Professionals, 2(2), 2016.
[4]. Vishal Prakash Giri Et Al, Prescription Audit Of Acne Vulgaris In Skin Outpatient Department Of A Tertiary Care Teaching Hospital, Journal Of Evolution Of Medical And Dental Sciences, 3(52), 2014.
[5]. Mallikarjun Vasam Et Al, Acne Vulgaris: A Review Of The Pathophysiology, Treatment, And Recent Nanotechnology Based Advances, Biochemistry And Biophysics Reports, 36, 2023.
[6]. Amita H. Sutaria Et Al, Acne Vulgaris, National Library Of Medicine, 2023.
[7]. Alexander KC Leung Et Al, Dermatology: How To Manage Acne Vulgaris, Drugs In Context, 10, 2021.
[8]. Manoj A Suva Et Al, A Brief Review On Acne Vulgaris: Pathogenesis, Diagnosis And Treatment, Research And Reviews: Journal Of Pharmacology, 4(3), 2014.
[9]. K. Kameswararao Et Al, A Brief Review On Acne Vulgaris, Research Journal Of Pharmacology And Pharmacodynamics, 11(3), 2019.
[10]. Jian Ting Yang Et Al, A Review Of Advancement On Influencing Factors Of Acne: An Emphasis On Environment Characteristics, Frontiers In Public Health, 8, 2020.
[11]. L Brown, Acne And Its Management, S Afr Pharm J, 87(5), 2020.
[12]. Roshaslinie Ramli Et Al, Acne Analysis, Grading And Computational Assessment Methods, Skin Research And Technology, 18, 2012.
[13]. Nibedita Patro Et Al, A Study On The Prescribing Pattern Of Drugs For Acne In A Tertiary Care Teaching Hospital In Odisha, Journal Of Clinical And Diagnostic Research,9(3), 2015.
[14]. Sanjay K Rathi, Acne Vulgaris Treatment: The Current Scenario, Indian Journal Of Dermatology, 56(1), 2011.
[15]. Abdul Kader Mohinuddin, Acne Vulgaris: Pimples No Not Have Simple Solution, International Journal Of Clinical & Experimental Dermatology, 4(2), 2019.

[16]. Nicholas Benner Et Al, Overview Of The Treatment Of Acne Vulgaris, Osteopathic Family Physician, 5, 2013.
[17]. Ryan Geng Et Al, Acne Vulgaris: Clinical Aspects And Treatments, Advances In Skin & Wound Care, 2024.
[18]. Linda K Oge, MD, Acne Vulgaris: Diagnosis And Treatment, American Family Physician, 100, 2019.
[19]. AK Mohiuddin, A Comprehensive Review Of Acne Vulgaris, Clinical Research In Dermatology, 6(2), 2019.