

# A Study on Prescription Pattern for Acne Vulgaris in a Tertiary Care Teaching Hospital

Sayan Sanyal<sup>1</sup>, Arun Chandran R<sup>2</sup>

<sup>1</sup>Pharm D Intern, Department of Pharmacy Practice, Acharya & BM Reddy College of Pharmacy, Bengaluru, Karnataka

<sup>2</sup>Assistant Professor, Department of Pharmacy Practice, Acharya & BM Reddy College of Pharmacy, Bengaluru, Karnataka

## Abstract

Acne vulgaris is also known as acne. It is a persistent skin condition that impacts millions of individuals worldwide. Acne vulgaris is caused by the bacteria *Propionibacterium*, anaerobic gram-positive bacteria. The pilosebaceous units are dominated by *Propionibacterium acnes*, which is an important resident of the normal human skin microbiota. Objectives: The goal of the study was to assess the prescription pattern of individuals diagnosed with acne vulgaris to know about the medication prescribed. It also aimed to assess knowledge and attitude of the individuals to know about their levels of knowledge and attitude about the acne vulgaris. Methodology: An observational study was carried out among 77 samples carried out in the Outpatient Department of Dermatology, ESIC MC - PGIMS, Rajajinagar, Bengaluru for 6 months. The data was collected by using self-designed data collection form and self designed content validated questionnaire and responses were recorded. All information's were processed and analyzed by using Microsoft excel. Results: The majority of the subjects involved in the study were prescribed with topical drugs. The majority of the subjects involved in the study were prescribed with topical benzoyl peroxide-2.5% and in oral doxycycline. The majority of the patients were found out to be in low knowledge patients with neutral attitude followed by patients had negative attitude. Conclusion: The most preferred prescribing therapy was topical route of administration. But in this study we didn't found out any single oral drug that was prescribed. All are prescribed along with the topical drugs. The correlation between the knowledge and attitude had statistically significant which shows there was a moderate positive relationship between the knowledge and attitude of the patients towards acne vulgaris disease. With the right coaching and guidance by means of educational programs, the patient's knowledge and attitude can be improved.

**Keywords:** Acne vulgaris, *Propionibacterium acnes*, knowledge, Attitude, Prescription pattern.

## 1. Introduction

Acne vulgaris is also known as acne. It is a persistent skin condition that impacts millions of individuals worldwide. Pilosebaceous disorder acne vulgaris, which is referred to as "common acne" and it primarily affects the peripubertal region. Numerous skin conditions are prefixed with the term so, to distinguish them from one another, such as pemphigus vulgaris which is the most prevalent form of pemphigus from pemphigus foliaceus, lupus vulgaris (a form of tuberculosis) from lupus erythematosus and acne vulgaris from acne rosacea which is now known as rosacea [1].

Acne vulgaris is caused by the bacteria *Propionibacterium*, anaerobic gram-positive bacteria. The pilosebaceous units are dominated by *Propionibacterium acnes*, which is an important resident of the normal human skin microbiota. It is also known as *P. acnes* [2]. It resides in the pilosebaceous follicle and is regarded as a component of the typical skin flora. *P. acnes* does, however, play a key part in acne vulgaris because it significantly increases the inflammation and irritability that come with acne. But other variables, such as genetics, hormonal changes, the start of puberty, and increased sex hormone production, can also contribute to acne vulgaris. Acne appearance is frequent at the time in life when a person becomes sexually mature and increased sex hormone production. The amount of sex hormones secreted, which tends to peak in the middle of adolescence, often correlates with the severity of the acne. Around a week before menstruation, acne tends to flare up in females. In order to stimulate sebaceous glands and cause acne, hormones are crucial. Dihydrotestosterone, a testosterone derivative and androgenic/sex hormone, directly stimulates sebaceous gland growth and metabolic rate. Surprisingly, sebum excretion will decrease as estrogen levels rise. Acne can occasionally be a symptom of hyperandrogenism. It can occur from irregular menstruation, hirsutism, or unexplained weight gain should always be done with female teenagers and adult patients who appear with acne. The need for testing for polycystic ovarian syndrome may then arise. An endocrine examination may also be necessary for females with acne that is resistant to standard treatment or who develop severe acne suddenly. Aside from these external causes of hair follicle occlusion, other variables might also lead to acne outbreaks. For instance, the usage of comedogenic goods, such as oily hair products and cosmetics, can result in inflammatory lesions and comedones. Due to mechanical irritation and blockage of the follicles, occlusive clothing such as collars, sports bras, caps, helmets, and chin straps can significantly worsen acne. Overzealous cleaning techniques can aggravate acne by irritating the skin mechanically, especially when exfoliants are used [1,3]. Acne vulgaris is classified into severity of disease as mild, moderate and severe [1,3]. And later it was graded by Indian authors using a simple grading system, which classifies acne vulgaris into four grades [4]. A systematic analysis of 369 diseases and injuries in 204 countries and territories from 1990–2019 found that in 1990 it was percentage of 1.1 (0.7 to 1.6) and changed it to percentage of 1.6 (1.0 to 2.4) and they found out total number of acne vulgaris patients at the age of 10-24 years. Globally, acne vulgaris was responsible for 4.96 million (95% UI 2.98–7.85) DALYs in 2019. Of these, 3.52 million (2.11–5.64) DALYs occurred in those ages 15–49 years old [5,6]. Another finding from India shows that the age-standardized years lived with disability have grown by a maximum of 60.5%, resulting in an increase in the overall burden of acne of roughly 153.8%. Another study conducted in India, where Grade II acne was seen in most of the patients (47%) followed by Grade III and I types and the mean age of the patient was found to be 24.64 [7,8].

The misuse of prescription drugs is a global problem, leading to ineffective and unsafe treatments, exacerbating or prolonging illness, causing distress to the patient, and economic burden. Prescription pattern monitoring studies as the study of drug use patterns in a hospital setting to analyse the rational utilization of drugs is a key component of the medical audit, which aims to monitor, evaluate, and propose modifications to prescribing practices in order to provide medical care that is both cost-effective and effective. Prescription patterns include information about the quantity and makeup of drug usage, drug quality, trends, and adherence to local, state, or federal regulations, including those pertaining to standard treatment protocols, the use of critical medications, and the use of generic medications. According to WHO estimates, half of patients do not take their prescription drugs as directed, and more than half of all pharmaceuticals are improperly prescribed, administered, or promoted. This audit is

essential in assessing therapeutic efficacy, reducing the occurrence of adverse effects, and providing prescribers with feedback to ensure that the practices are in line with the guidelines. Prescription is an essential tool in the management of a patient's illness, with the aim of providing maximum therapeutic effect with minimal adverse effects [10,11]. Knowledge and Attitude surveys are known as KA surveys which is a quantitative approach that accesses both quantitative and qualitative data using prepared questions and standard questionnaire formats with. A sample of people who are as representative of the full research population as feasible is interviewed using a questionnaire. Knowledge is a collection of understandings, knowledge, and "science." Additionally, it is an individual's capacity for imagination and mode of perception. A way in being a position is called attitude. It is between the situation and the response to the situation, this serves as an intermediary variable. It is a good idea to assess the subjects that is better than to assess practice [12,13]. There are studies conducted on KA and Prescription pattern in recognized hospitals or tertiary care teaching hospitals in which many studies are done in private hospitals. There is least number of studies that are having in government hospitals around South India region. The patient populations served by private hospitals may differ from those in government hospitals. Government hospitals may prioritize services delivery over research.

## 2. Results

79 samples were collected, of these, 2 samples were dropped out due to insufficient data, so the overall sample size (n) is 77. The highest number of patients included in the study belonged to the group of female gender with 46 (59.47%) and followed by male of 31 (40.26%). The highest number of patients was found to be in the group of 15-20 years of age with 33 (42.86%) patients followed by 21-25 years of age with 14 (18.18%) patients, 26-30 years of age with 12 (15.58%) patients both less than 15 years and greater than 30 years of age with 9 (11.69%) patients as shown in table 1. The highest number of patients was found to be in grade 1 with 38 (49.35%) number of patients followed by 23 (29.87%) in grade 2, 14 (18.18%) in grade 3 and grade 4 with 2 (2.59%) number of patients. Total number of drugs prescribed by topical route of administration was found to be 153. In which most number of drug prescribed was benzoyl peroxide-2.5% in 36 (23.53%) patients followed by clindamycin gel-1% in 34 (22.22%) patients, saliwash facewash in 21(13.73%) patients, adapalene 0.1% + clindamycin 1% in 15 (9.80%), neoglow facewash in 10 (6.54%) patients, tretinoin cream-trans retinoic acid 0.05% in 9 (5.88%) patients, uryl cream in 8 (5.23%) patients, Sunscreen Shadow SPF 30 Lotion in 5 (3.27%) patients, adapalene Gel 0.1% in 5 (3.27%) patients, white soft paraffin in 4 (2.61%) patients, photostable sun screen gel SPF40 in 1 (0.65%) subject, acnemoist cream in 1 (0.65%) subject, glycolic acid cream 6% in 1 (0.65%) subject, glycerin lotion in 1 (0.65%) patient as shown in table 2. Total number of drugs prescribed by oral route of administration was found to be 54. In which the highest number of drug that is given though oral route is doxycycline in 21 (38.89%) patients followed by isotretinoin in 13 (24.07%) patients, azythromycin in 10 (18.52%) patients then cetirizine in 10 (18.52%) patients as shown in figure 1. On the basis of their formulation where in topical route of administration, gels were prescribed in 91 (43.96%) patients followed by facewash in 31 (14.98%) patients, cream in 25 (12.08%), lotion in 6 (2.90%) patients shown in figure 2. In oral route of administration, tablets were prescribed in 33 (15.94%) patients followed by capsules in 21 (10.14%) patients. Most of the prescribed retinoids class of drugs are found in grade 1 (14) patients, antihistamines in grade 2 (4) patients, combination of antibiotic + retinoid in grade 2 (6) patients, keratolytic agents in grade 1 (18) patients shown in table 3. Among antibiotics lincosamide in grade 2 (15) patients, tetracyclines in grade 2 (9) patients,

benzoylperoxide-2.5% in grade 1 (17) patients, macrolide in grade 1 (4), grade 2 (4), grade 3 (4) and at last miscellaneous drugs in grade 1 (12) patients shown in table 4. Overall analysis of all the prescriptions was done as shown in table 5. Self-validated questionnaire were used (shown in table 6) with bloom's cut-off scale to assess the overall knowledge. In which majority of the patients were found out to be in low knowledge 50 (64.94%) patients as shown in table 7. To assess the overall attitude (shown in table 8) we used bloom's cut-off scale. 61 (79.22%) of patients found out to be in neutral attitude followed by 16 (20.78%) patients had negative attitude as shown in table 9. Results of the spearman correlation indicated that there is a significant moderate positive relationship between knowledge and attitude. The result of p-value is 0.002 (<0.05) which shows that it is statistically significant shown in table 10.

### 3. Discussion

In our study the highest number of patients belonged to the group of female gender with 46 (59.47%) and followed by male of 31 with 40.26 percentage similar to a study conducted by Ahmad A et al.,(2023) found out patients who were female (58%) as opposed to patients who were male (42%). In our study the highest number of patients was found to be in the group of 15-20 years of age with 33 (42.86%) patients followed by 21-25 years of age with 14 (18.18%) patients, 26-30 years of age with 12 (15.58%) patients both less than 15 years and greater than 30 years of age with 9 (11.69%) patients similar to the study conducted by Giri VP et al., (2014) where majority of patients 79 (65.83 %) belonged to 15-25years age group, 38 (31.67 %) 26-40 years and 3 (2.5 %) >40 years. Our study had maximum number of patients to be in grade 1 with 12 male and 26 female then followed by grade 2 in which 10 were male and 13 were female, grade 3 with 8 male and 6 female and in grade 4 single patient was found in both male and female but in study conducted by Budamakuntla L et al., (2020) found out most of the patients in grade 2 (47%) followed by Grade III and I due to the different geographic condition. In our study benzoyl peroxide-2.5% in 36 (23.53%) patients followed by clindamycin gel-1% in 34 (22.22%) patients similar to the study conducted by Dharrao SB. et al., (2019) where benzoylperoxide in 83 (20.04%) patients but contradicted to the study done by Giri VP et al., (2014) where they found out bezoyl peroxide-5% to be the most prescribed drugs among topical. Our study shows that highest number of drug that is given though oral route is doxycycline in 21 (38.89%) patients followed by isotretinoin in 13 (24.07%) patients, azythromycin 10 (18.52%) patients similar to the study conducted by Sane RM et al., (2020) where doxycycline was most common (63.36%) patients. In our study topical drugs are mostly prescribed where gels were highly prescribed in 91 (43.96%) patients. similar to the study conducted by M P et al., (2018) among the drugs prescribed for topical use, the most common formulations were gels (202 drugs, 39.3%) followed by creams (136 drugs, 26.46%) and lotions (110 drugs, 21.4%) and the most common formulation of drugs for systemic use was capsules (58 drugs, 59.18%) followed by tablets (40 drugs, 40.82%). This study had found out that oral route of administration, antibiotics were prescribed more in 31 (57.40%) patients similar to the study conducted by Belhekar MN et al., (2023) where antibiotics were prescribed more in terms of oral route of administration. In our study majority of the patients were found out to be in low knowledge 50 (64.94%) patients but the study conducted by Ansari F et al., (2023) where they found out 59.5% had average knowledge but contradicted to the study conducted by Alrabiah Z et al., (2022) due to the more number of graduate students included in their study. In our study majority 61 (79.22%) of patients found out to be in neutral attitude followed by 16 (20.78%) patients had negative attitude but a study conducted

Hulmani M et al., (2017) found majority of the patients had unfavorable attitude. This study had analyzed that Overall prescriptions, where total number of prescriptions was 77 and with total drugs prescribed 265 in which oral drugs were prescribed 71 times and total topical drugs were found to be 194. And average number of drugs prescribed per prescriptions was found to be 3.44 similar to the study conducted by Dharrao SB. et al., (2019) where they found highest numbers of drugs were prescribed through oral route.

#### **4. Conclusion**

The present study was conducted in a tertiary care teaching hospital, focusing only on the patients visiting out-patient department of dermatology. Most of the patients were found to be female. And the most common age was found to be 15-20 years of age group. This study had seen highest number of grade 1 group of patients with mostly 0-12 months of duration of disease. The most preferred prescribing therapy was topical route of administration. Benzoyl peroxide -2.5% was the most commonly prescribed drugs followed by clindamycin gel-1%. Adapalene 0.1% + Clindamycin 1% was the combination therapy prescribed in this study. In present study, it was observed that the mostly oral prescribing drugs doxycycline, isotretinoin, azithromycin. In which isotretinoin 10 mg and 20 mg were prescribed. But in this study we didn't found out any single oral drug that was prescribed. All are prescribed along with the topical drugs. This study has found out patients were having low level of knowledge towards the acne vulgaris disease with neutral level of attitude. The correlation between the knowledge and attitude had statistically significant which shows there was a moderate positive relationship between the knowledge and attitude of the patients towards acne vulgaris disease. With the right coaching and guidance by means of educational programs, the patient's knowledge and attitude can be improved.

#### **5. Materials and Methods**

##### **5.1. Study Protocol**

This is an observational study and was carried out for a period of 6 months. The study was carried out in the Out-patient Department of Dermatology, ESIC MC - PGIMSR, Rajajinagar, Bengaluru for 6 months. Using the formula, sample size was found to be 70 samples.

##### **5.2. Exclusion criteria:**

1. Subjects not willing to give consent
2. Subjects who are neonatal and infantile acne

##### **5.3. Sample collection and preparation**

A data collection form was designed to collect subject demographic aspects like age, gender, occupation, phone number, duration of disease, educational status and diagnosis. A self administered questionnaire had been made and validated, which contains 11 knowledge questions and 6 attitude questions. For attitude questionnaire Likert's 5 point scale was used for scoring.

##### **5.4. Statistical analysis**

All recorded data were entered and analyzed using MS Excel for determining for the statistical significant. Descriptive statistics were computed for quantitative variables and frequencies and percentages were calculated for categorical values. Column charts, pie-charts, bar graphs were made to find the nature of data distribution. Spearman correlation coefficient was applied to the data to find the

relation between the knowledge and attitude of the subjects. Bloom’s cut-off category was used to categorise the level of knowledge and attitude among the subjects.

**Figures and Tables**

**Table 1. Age distribution in Acne vulgaris.**

Sl. No.	Age (in Years)	Number of Patients (n)	Percentage
1	<15	9	11.69
2	15-20	33	42.86
3	21-25	14	18.18
4	26-30	12	15.58
5	>30	9	11.69

**Table 2. List of drugs prescribed by topical route of administration**

Sl. No.	Name of Drugs	Total number of Patients (n)	Percentage
1	URYL Cream	8	5.23
2	Clindamycin Gel - 1%	34	22.22
3	Benzoyl Peroxide- 2.5%	36	23.53
4	Saliwash Facewash	21	13.73
5	NeoGlow Facewash	10	6.54
6	Sunscreen Shadow SPF 30 Lotion	5	3.27
7	Crixan Cream	2	1.31
8	Adapalene 0.1% + Clindamycin 1%	15	9.80
9	Adapalene Gel 0.1%	5	3.27
10	Tretinoin Cream-Trans Retionic Acid 0.05%	9	5.88
11	photostable sun screen gel SPF40	1	0.65
12	acnemoist cream	1	0.65
13	Glycolic Acid cream 6%	1	0.65
14	Glycerin Lotion	1	0.65
15	White Soft Paraffin	4	2.61

**Table 3. Distribution of drugs prescribed on the basis of grades**

Sl. No.	Class of Drugs	Grades			
		1	2	3	4
1	Retinoids	14	6	5	2
2	Antihistamines	3	4	3	0
3	Antibiotic + Retinoid	4	6	3	2
4	keratolytic agents	18	8	2	1
5	Antibiotics	41	39	18	5
6	Miscellaneous	12	7	2	2

**Table 4. Distribution of drugs on the basis of classification**

Sl. No.	Class of Drugs	Number of Patients (n)	Percentage
1	Retinoids	27	13.04
2	Antihistamines	10	4.83
3	Antibiotic + Retinoid	15	7.25
4	keratolytic agents	29	14.01
5	Lincosamide	34	16.43
	Macrolide	12	5.80
	Tetracyclines	21	10.14
	Benzoyl Peroxide- 2.5%	36	17.39
6	Miscellaneous	23	11.11

**Table 5. Analysis of overall prescriptions**

Total number of prescriptions	77
Total number of drugs prescribed	265
Total number of drugs prescribed through oral route	71
Total number of drugs prescribed through topical route	194
Average number of drugs prescribed per prescriptions	3.44

**Table 6. Distribution of correct responses to knowledge questions**

Knowledge related questions	n	Percentage
From where do you get to know about acne	30	38.96
Common age in which acne can cause	54	70.13
Acne can cause due to Family history	26	33.77
Acne can cause due to stress	26	33.77
Hormone changes can contribute to acne	43	55.84
Makeup and cosmetics can contribute in development of acne	54	70.13
Diet can contribute in development of acne	37	48.05
Summer season can increase the condition of Acne	56	72.73
Acne can Increase/worst due to squeezing, scratching, rubbing	50	64.94
Sleep disturbance can worsen/increase the condition of acne	32	41.56
Pregnancy can contribute to acne	15	19.48

**Table 7. Distribution of patients on the basis of category of knowledge**

Knowledge	Scores in (%)	Total number of Patients	Percentage
<b>High Knowledge</b>	80-100	10	12.99
<b>Moderate Knowledge</b>	60-79	17	22.08
<b>Low Knowledge</b>	<60	50	64.94

**Table 8. Distribution of responses to attitude questions**

Attitude related questions	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Take your own medications when you have acne.	1	12	14	41	9
Apply home treatments immediately when you have acne.	2	19	18	34	4
Acne will cause you to get depressed.	1	22	14	36	4
Whenever you develop acne, talk to others about it.	6	21	33	17	0
You won't want to go out if you have acne.	1	21	19	26	10
Do nothing if you develop acne.	7	20	12	31	7

**Table 9. Distribution of patients on the basis of category of attitude**

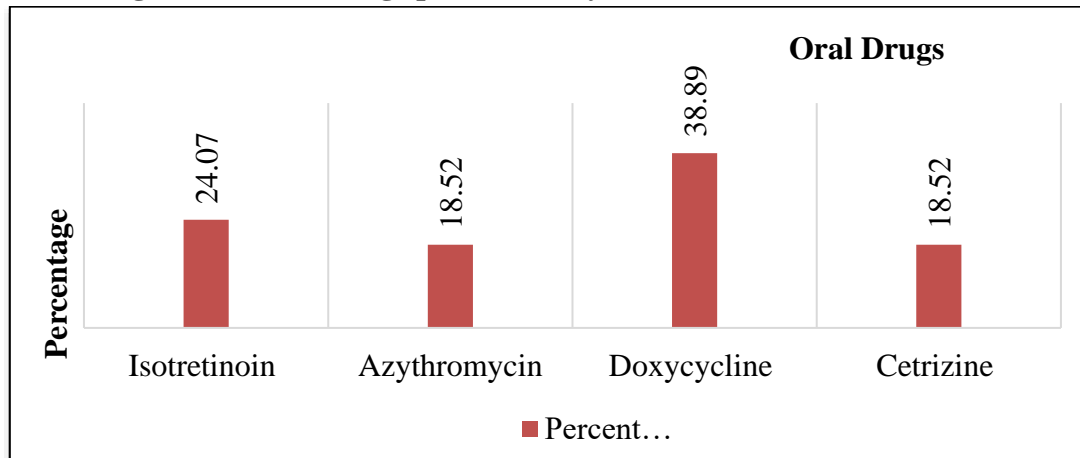
Attitude	Scores in (%)	Total number of Patients	Percentage
<b>Positive Attitude</b>	80-100	0	0.00
<b>Neutral Attitude</b>	60-79	61	79.22
<b>Negative Attitude</b>	<60	16	20.78

**Table 10. Correlation between knowledge and attitude**

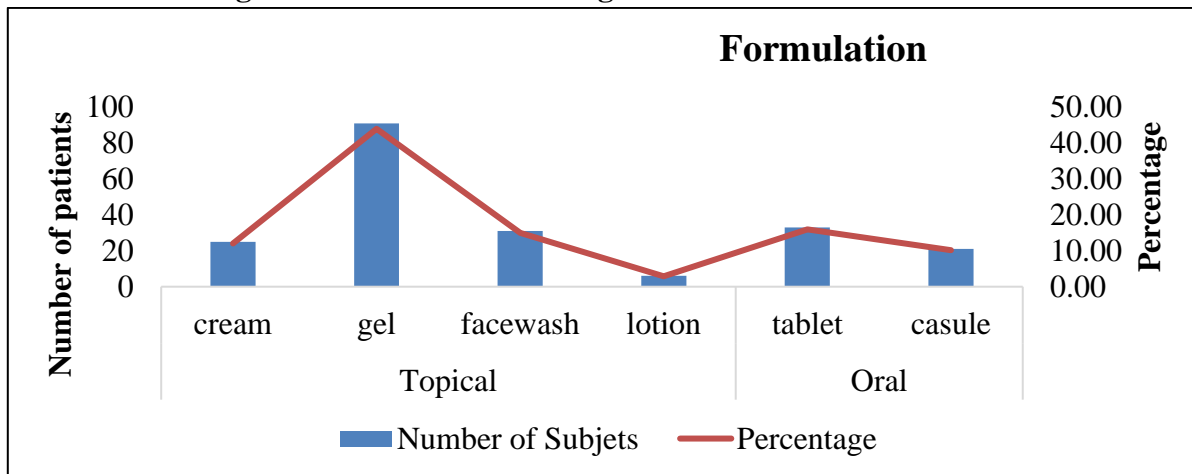
Parameter	Value
p-value	0.002
Spearman's correlation coefficient ( $r_s$ )	0.3437



**Figure 1. List of drugs prescribed by oral route of administration**



**Figure 2. Distribution of drugs on the basis of formulation**



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