Original Research Article

Drug Prescription Pattern in the Treatment of Acne Vulgaris: An Observational Study

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Abstract

Background: With excessive sebum production, follicular epidermal hyperproliferation, inflammation, and Propionibacterium acnes activity, acne vulgaris is the most prevalent skin condition of the pilosebaceous unit. It affects about 80% of teenagers and can cause physical disability as well as serious psychological and social problems. This study seeks to assess the prescription pattern and its justification in the drug treatment of acne vulgaris.

Methods: This prospective, hospital-based, observational research assessed the subjects' demographics, disease status, and drug therapy information while taking into account the inclusion and exclusion criteria.

Results: A total of 346 patients' prescription records were examined; 45.1% of the male patients had an average age of 21.9 ± 40.3 years. Grade II (53.17%) had the highest prevalence among the four grades of Acne Vulgaris, followed by Grade I (26.58%), Grade III (13.87%), and Grade IV (6.35%). There were 514 drugs recommended for topical use, with tretinoin alone accounting for 19.46% of those prescriptions, followed by benzoyl peroxide (12.45%), tretinoin and clindamycin (17.12%), clindamycin alone (10.51%), etc. There were 98 medications given for systemic use, with Doxycycline accounting for 55.1% of those, Azithromycin for 34.7%, Isotretinoin for 6.12%, and Erythromycin for 4.08%.

Conclusion: Most prescriptions were logical and did not allow for polypharmacy.

Keywords: Acne Vulgaris, Dermatology, Rational Prescription.

Introduction

The human body's biggest organ is the skin. It is inhabited by a wide variety of microbes, including fungi, viruses, and bacteria. The microorganisms are good for the body and guard against the incursion of pathogens that are harmful. The assumption is that the epidermis functions as a biological and physical ecosystem where the host and the microorganism coexist in harmony. Skin conditions or diseases are brought on by a disturbance in this equilibrium [1]. 12.4% of all medical conditions seen by doctors are skin diseases [2]. The patient's mental health and quality of life are both impacted by skin conditions. In light of this, the discipline of psychodermatology has emerged as a result of growing interest in and knowledge of the connection between various psychological factors and skin disorders [3].

Over 80% of teens suffer from acne vulgaris, the most prevalent skin condition among adolescents. However, the

prevalence has reduced as a result of the improved treatment. Although severe morbidity, mortality, or bodily disability are not linked to acne, it can still have social and psychological effects [4]. Acne is derived from the Greek word 'acme' which means point/spot. Ancient Greek knew acne as 'tovoot' which means first growth of the beard. Therefore, development of acne was associated with puberty [5]. Acne is a chronic inflammatory disease of the pilosebaceous unit described by factors such as, increased sebum production from the sebaceous glands; hormone androgen; formation of microcomedo which progresses to a comedone due to hyperkeratinization of the follicle; colonization of the follicle formed by Propionibacterium acnes leading to an inflammatory reaction [6]. Acne affects the areas of the skin with dense sebaceous follicles, whichis face, the upper part of the chest and the back. The prevalence and severity of acne on the face, chest and backwere shown to be 92%, 45%, 61% respectively [7]. Acne vulgaris can cause both non-inflammatory comedones and inflammatory papules, pustules, nodules, and tumours as well as other skin lesions. Simple grading is used to assess the severity of acne vulgaris based on clinical evaluation, lesion tally, photos, video microscopy, and sebum production measurement. The first individual to evaluate acne vulgaris using a scoring system was Carmen Thomas of Philadelphia. There are numerous methods for categorising the intensity of acne at the moment [8].

Topical and systemic antibiotics are both used in the treatment of acne vulgaris. Retinoids, Benzoyl Peroxide, and Clindamycin are examples of topical agents that are known to lessen follicle obstruction and avoid Propionibacterium resistance. Doxycycline, erythromycin, and azithromycin are common systemic antibiotics. Severe refractory nodular acne may be treated with oral isotretinoin. It is a potent drug, but it must be avoided in female patients of childbearing age group because of its teratogenic properties. Hormonal agents like Estrogen-containing oral contraceptives, oral antiandrogens such as Spironolactone, Cyproterone acetate, and Flutamide are found to be useful in the treatment of acne. Other miscellaneous therapies are acupuncture, avoiding diet with high glycemic index, intralesional corticosteroid injections, Glycolic acid and Salicylic acid-based peeling, comedone removal, microdermabrasion and use of Tea tree oil and other medicinal plant products [6, 11, 12].

A prescription is a crucial tool in the treatment of a patient's disease in order to achieve the greatest therapeutic benefit with the fewest side effects. An international problem, irrational prescriptions lead to ineffective and risky therapy, illness aggravation or prolongation, patient distress and harm, and financial load. The rational use of medications will guarantee that patients receive the right medications in accordance with their clinical needs, in dosages that satisfy their unique needs for an adequate length of time, and at the least expensive possible to them and their community [13, 14].

The prescription will be periodically audited to make sure the drugs are reasonable and are not placing an unnecessary burden on the patient in terms of expense or side effects. A component of the medical audit is the study of prescribing patterns, which aims to evaluate, assess, and propose changes to prescribing practises to make medical care rational and cost-effective [15, 16]. In order to educate the esteemed medical community, the current research plans to analyse the data and evaluate the prescription pattern, extent, rationality, and frequency of medications used to treat acne vulgaris.

Materials and Methods

This prospective cross-sectional, observational, descriptive epidemiological study was conducted at Department of Dermatology Venerology and Leprology, Katihar Medical College. The study was approved by the institutional research and ethical committee. The study was conducted between January 2022 and June 2022. An informed and written consent was taken from the participating subjects prior to the commencement of the study.

Inclusion criteria: Patients who report to the Outpatient Dermatology Venerology and Leprology, age 12 years or more of either gender, diagnosed with Acne Vulgaris Grade I to Grade IV.

Grade 1: Come dones and occasional papules.

Grade 2: Papules with come dones and few pustules.

Grade 3: Predominant pustules with nodules and abscesses.

Grade 4: Mainly cysts and abscesses associated with widespread scarring.

Exclusion criteria: The patients excluded from the study include those who are hypersensitive to antibiotics, pregnant and lactating women, drug-induced acne.

Data collection

The data was collected in a specially designed proforma which included the following details:

1. Demographic data: Name, age, gender, address.

2. Disease data: Diagnosis of the disease with grading.

3. Data pertaining to the drug therapy which included: Drug/ drugs prescribed, route of administration, drug formulations, dose, and frequency of administration and duration of treatment.

Statistical analysis

The data collected in the Performa were tabulated in the Microsoft excel sheet. The data was further subjected to statistical analysis using SPSS software (version 16.0) and represented as number and percentage.

Results

The Outpatient Department examined 346 prescriptions for patients with Acne Vulgaris in total. 156 (45.1%) and 190 (54.9%), or a total of 346 cases, were men and women, respectively. All of the individuals had an average age of 21.94 ± 5.3 years. There are four grades of acne vulgaris, with Grade II (184 patients, 53.17%) being the most frequently reported. Grade I (92 patients, 26.58%) and Grade III (48 patients, 13.87%) were the next most frequently reported grades (Table 1).

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

Grade of acne vulgaris	Males(n)	Females(n)	Total n (%)
I	34	58	92 (26.58)
II	84	100	184 (53.17)
III	20	28	48 (13.87)
IV	18	4	22 (6.35)
Total	156	190	346 (100)

The total number of medications given out of the 346 prescriptions was 612. One to four medications were given for each patient. 1.77 medications on average were prescribed for each patient. However, 142 patients (26.6%) got monotherapy while 146 patients (42.2%) received 2 medications per prescription. Among 604 prescriptions (98.7%), drugs were given in brand labels. 98 drugs (16.01%) were recommended for systemic use, compared

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to 514 drugs (83.99%) that were prescribed for topical use.

Out of the 346 prescriptions and among the 514 drugs prescribed for topical use, the highest prescribed was Tretinoin alone (100 prescriptions, 19.46%), followed by a combination of Tretinoin and Clindamycin (88 prescriptions, 17.12%), and Facewashes (80 prescriptions, 15.56%)

and Benzoyl Peroxide (64 prescriptions, 12.45%). Of the514 topically prescribed drugs for Acne Vulgaris, 80 drugs (15.56%) were Facewash. Among these, the most commonly prescribed facewashes contained Salicylic acid, (28 drugs, 35%) and a combination of Glycolic acid and Aloe Vera, (28 drugs, 35%) (Table 2).

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

Topical drugs	Number of prescriptions	Percentage
Tretinoin	100	19.46
Tretinoin + clindamycin	88	17.12
Facewash	80	15.56
Benzoyl Peroxide	64	12.45
Clindamycin	54	10.51
Adapalene + benzoyl peroxide	40	7.78
Benzoyl peroxide + clindamycin	26	5.06
Sunscreen	16	3.11
Azelaic acid	12	2.33
Adapalene	8	1.56
Clindamycin + nicotinamide	6	1.17
Mupirocin	6	1.17
Aloe vera	6	1.17
Fusidic acid+ betamethasone	4	0.78
Peeling	4	0.78
Total	514	100

Doxycycline (54 prescriptions, or 55.10%), azithromycin (34 prescriptions, or 34.7%), and isotretinoin (6 prescriptions, or 6.12%) were the three most frequently prescribed medications out of the 346 prescriptions and 98 drugs recommended for systemic use. There were 164 fixed dose combinations given overall (26.7%) out of the 612 medications prescribed in 346 prescriptions. A combination of Benzoyl Peroxide and Adapalene (40 prescriptions, 24.4%), Benzoyl Peroxide and Clindamycin (26 prescriptions, 15.85%), and Tretinoin and Clindamycin (88 prescriptions, 53.66%) were the next most frequently given FDCs. As mentioned earlier, out of the 612 drugs prescribed, 514were prescribed for topical use and the rest 98 were prescribed for systemic use. The most common

formulation of the topical drug was gels (202 drugs, 39.3%) followed by creams (136 drugs, 26.46%) and lotions (110 drugs, 21.4%). Likewise, out of the 98 drugs prescribed for systemic use, 58 drugs (59.18%) were prescribed in the form of capsules while the remaining 40 drugs (40.82%) were prescribed in the form of Tablets.

Discussion

A key tool in evaluating the level of patient treatment provided in a health care system is the prescription pattern. This research was carried out to examine the pattern of prescriptions made for the treatment of Acne Vulgaris. 346 patients who reported having acne vulgaris at the dermatology outpatient department had their medications screened. The male to

female ratio among the 346 cases was 1:1.21, with 156 (45.1%) and 190 (54.9%) patients being men and women, respectively. The patients' average age was 21.94 ± 5.3 years. In contrast, Santosh Kumar et al's results stated that the male to female ratio was 1:1.07 and that the mean age group was 21.67 ± 0.51 years [17].

We determined that Grade II was the most common of the four grades of Acne Vulgaris (184 patients, 53.17%), followed by Grade I (92 patients, 26.58%), and Grade III (22 patients, 6.35%). In a related research, Grade II was found to be most prevalent, followed by Grade III and Grade I, respectively [18]. Out of the 346 prescriptions, the total number of drugs prescribed was 612 and the number of drugs per prescription was 1.77 while the other studies have much higher values like 5.13, 4.76, 3.26 and 2.7 drugs per prescription respectively [17, 19-21]. This explains the tendency of polypharmacy for the symptomatic treatment of Acne Vulgaris. Concerns with Polypharmacy include increased the risk of side effects, drug-drug interactions, and increased financial burden for the patients and also a lack of strategies for the guidance of this practice [22].

While other studies have consistently found that 100% of drugs are given under their brand names, the study found that 98.7% of the drugs were prescribed under their brand names. 204 patients (58.96%) got polytherapy, compared to 142 (41.04%) patients who received monotherapy. 164 Fixed Dosage Combinations (FDC) made up 26.79% of the total. In contrast to these findings, the authors of the study claim that 93.8% of patients got polytherapy and 6.2% of patients received monotherapy. Also, in comparison to the study conducted by Santosh et al, the number of Fixed Dose Combinations were only 3.08% while it is much higher in our study. Fixed-dose combinations are of value when they are developed on the basis of rational

Pharmacokinetic and Pharmacodynamics criteria and the combination should produce a synergistic effect and should not possess any supra- additive toxic effect. FDC's are also convenient and have better patient compliance [17, 18, 23, 24].

514 drugs (83.99%) were recommended for topical application out of the 346 prescriptions and 612 drugs screened, while 98 drugs (16.01%) were intended for systemic use. This was not in line with the data provided by the authors, who stated that 52.56% of the drugs prescribed were for topical use and 47.44% were for systemic use [18]. 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%). The results were different when compared with a study published by Anuj et al. which reported that majority of topical formulations were in the form of creams followed by lotions and gel. In the case of systemic drugs, tablets were more prescribed than capsules [19]. Out of 612 drugs, 362 drugs (59.15%) were taken from the National List of Essential Medicines. In contrast to this, 39.92% of the drugs were prescribed from the NLEM as mentioned by Santosh et al in their study [17, 26,27].

Conclusion

One of the most prevalent skin conditions, acne vulgaris is a serious problem because it affects people's quality of life and psychological wellbeing. This research was carried out to record and evaluate the prescribing patterns for Acne Vulgaris by dermatologists in light of growing concerns about the prudent use of medications, the requirement for auditing the prescriptions, as well as for the improvement of patient care systems. We discovered that the therapy was empirical but logical in accordance with the body of

available research and was founded on clinical knowledge and experience.

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