Original Article

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Dermatology Section

A Study on the Prescribing Pattern of Drugs for Acne in a Tertiary Care Teaching Hospital in Odisha

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ABSTRACT

Background: Acne vulgaris is a common disease of the skin affecting the socially vulnerable young age group. There are multitudes of treatment options available but till now no studies have been reported to demonstrate the current prescribing pattern of drugs in acne vulgaris.

Aim: To study the prescribing pattern of drugs in acne in a tertiary care teaching hospital in Odisha, India.

Materials and Methods: The study was an observational study conducted for a period of one year on patients more than 10 yeras age and having acne attending the Skin & VD OPD. Drug induced acne and acneiform eruptions were excluded.

Results: A total of 1210 prescriptions of acne were analysed. The male to female ratio was 1:1.29. Most patients presented with grade 2 (60%) acne followed by grade 3 (20.99%). Out of prescribed drugs, 47.44% were oral and 52.56% were topical formulations. Oral isotretinoin (68.10%) was the most frequently prescribed drug among oral formulations. Doxycycline (54.18%) was the most preferable oral antibiotic. The average number of drugs per prescription was 3.003. Polypharmacy was preferred over monotherapy.

Conclusion: In the management of acne, judicious and early intervention with oral isotretinoin improves the overall treatment outcome, the fact which has increased its use in acne patients.

Keywords: Acne vulgaris, Doxycycline, Isotretinoin, Polypharmacy

INTRODUCTION

Acne is a disease of the pilosebaceous unit and affects more than 80% of the general population in their lifetime [1]. It is believed to be a disease of the adolescence and is generally self-limiting. However, a significant percentage of individuals continue to suffer from the disease in their adulthood as well.

Clinically acne presents as comedones (pathognomonic lesion), inflammatory papules, pustules, nodules and cysts. It affects the sebaceous gland bearing areas of the skin viz. face, neck, chest, back and upper arms. Apart from the clinical severity, acne patients suffer from complications like post inflammatory hyperpigmentation and scarring. Due to the visible sites affected it leads to extreme disfigurement, impairing the patient's quality of life. It may also result in social impairment, loss of confidence, depression and even suicidal tendencies [2,3].

The various treatment options available aim to reduce the non-inflammatory lesions, the existing inflammation, bacterial colonization and minimize complications. Careful assessment of the morphology and severity of acne lesions is a primary and important step in the management, as the treatment strategy targets the patient's predominant lesion type. So this study was undertaken to overview the current prescribing pattern of anti-acne drugs in different types of acne in a tertiary care teaching hospital.

MATERIALS AND METHODS

The study was conducted in the Dermatology out-patient department (OPD) in collaboration with the Department of Pharmacology of Institute of Medical Sciences & SUM Hospital, Siksha 'O' Anusandhan University, Bhubaneswar, Odisha which was approved by Institutional Ethics Committee and informed consent was taken from each patient.

It was undertaken for one year from March 2013 to February 2014. The current study was designed as a unicentric observational study. The subjects who had willingly participated were enrolled on the basis of inclusion and exclusion criteria. The patients having acne and of more than 10 y of age were included in the study. Patients having drug induced acne and acneiform eruptions were excluded.

PARAMETERS FOR EVALUATION

The parameters included gender distribution, age of the patients, type of acne, group of antiacne medications prescribed, average number of drugs per prescription, number of fixed dose combinations and type of prescription.

STUDY METHODOLOGY

Prescriptions were collected from patients attending the dermatology OPD suffering from acne in between the period from March 2013 to February 2014. The prescribing pattern of antiacne agents was analysed. No follow up of prescription was done.

OBSERVATIONS AND RESULTS

A total of 1210 prescriptions of acne patients were collected over one year period and were analysed. Out of a total of 1210 patients, 681(56.28%) were females and 529 (43.71%) were males [Table/Fig-1], which shows almost equal prevalence of acne in both sexes. Out of the 365 patients presenting in adult age group, the male to female ratio was found to be 1:2.35, showing female preponderance in this age group.

Most [Table/Fig-2] number {726 (60%)} of patients presented with grade 2 disease, followed by grade 3 {254 (20.99%)}, grade 1 {145 (11.98%)} and grade 4 {85 (7.02%)}.

Depending on the grade (severity) of acne the various medications prescribed are listed in [Table/Fig-3,4], which includes oral formulations like isotretinoin, doxycycline, minocycline, azithromycin, clarithromycin and topical formulations like adapalene, tretinoin, clindamycin, benzoyl peroxide, nadifloxacin, azithromycin and different fixed dose combinations.

A total number of 3634 drugs [Table/Fig-5] were prescribed in 1210 prescriptions and the average number of drugs per prescription was found to be 3.003. A total of 1009 fixed dose combinations were

Age in year	Male (%)	Female (%)	Total
10 - 25	420 (79.40%)	425 (62.41%)	845
26 – 45	83 (15.69%)	207 (30.40%)	290
>45	26 (4.91%)	49 (7.20%)	75
Total	529	681	1210

[Table/Fig-1]: Age wise distribution of Male: Female ratio among acne cases

Grade	Number of cases (%)
Grade 1	145 (11.98%)
Grade 2	726 (60%)
Grade 3	254 (20.99%)
Grade 4	85 (7.02%)

[Table/Fig-2]: Distribution of disease as per grade of acne

Category	Oral	Topical
Retinoids	Isotretinoin	Adapalene (ADA) Tretinoin (TRE)
Antibiotics	Doxycycline Minocycline Azithromycin Clarithromycin	Clindamycin (CLIN) Nadifloxacin (NADI) Azithromycin (AZI)
Miscellaneous		Benzoyl peroxide (BPO)
Fixed dose combinations		CLIN + ADA CLIN + BPO CLIN + TRE BPO + ADA NADI + ADA AZI + ADA

[Table/Fig-3]: Category of drugs used in acne

Grade	Oral	Topical
Grade 1	Retinoid	Retinoid Retinoid + BPO
Grade 2	Antibiotic Retinoid	Antibiotic Antibiotic + Retinoid Antibiotic + BPO Retinoid + BPO
Grade 3	Retinoid Antibiotic	Antibiotic Antibiotic + Retinoid Antibiotic + BPO
Grade 4	Retinoid Antibiotic	Antibiotic Antibiotic + Retinoid Antibiotic + BPO AZI + ADA

[Table/Fig-4]: Categories of drugs used according to grade of acne

Number of prescriptions	1210
Total no. of drugs prescribed	3634
Total no. of drugs prescribed through oral route	1724 (47.44%)
Total no. of drugs prescribed through topical route	1910 (52.56%)
Average no. of drugs prescribed per prescription	3.003
Number of fixed dose combinations	1009

[Table/Fig-5]: Analysis of prescriptions

prescribed. Out of 3634 drugs prescribed, 1724 (47.44%) were oral and 1910 (52.56%) were topical formulations. In oral formulations, isotretinoin {1174 (68.10%)} was the most frequently prescribed drug, as compared to 550 (31.90%) prescriptions of antibiotics. Doxycycline {298 (54.18%)} was the most frequently prescribed oral antibiotic followed by azithromycin {213 (38.73%)}, minocycline {30 (5.45%)} and clarithromycin {9 (1.64%)}. Polypharmacy was seen in 1135 (93.80%) prescriptions as compared to 75 (6.20%) prescriptions with monotherapy [Table/Fig-6].

Type of prescription	No. of prescription (%)
Monotherapy	75 (6.20%)
Polytherapy	1135 (93.80%)

[Table/Fig-6]: Type of prescription

DISCUSSION

Acne is known to be a disease of the adolescents affecting approximately 85% of the teenagers [4,5]. The average age of onset of acne is 11 y in girls and 12 y in boys [6,7]. Acne is increasing in children of younger ages and this trend towards earlier development of acne is thought to be related to the decreasing age-of-onset of puberty that has been observed in the United States [8]. Acne is more commonly seen in males in adolescence and early adulthood, a trend that reverses with increasing age and adult acne is more common in women [6,7].

Adult acne has been described as presence of acne beyond 25 y of age [9]. It can be either persistent acne or late onset acne. Adolescent acne persisting beyond the age of 25 y is persistent acne whereas late onset acne develops for the first time after the age of 25 y. As described earlier adult acne is commonly seen in women [9-12]. The hormonal factors, increased use of cosmetics and exposure to hot and humid conditions while cooking have been implicated for the increased prevalence of adult acne in women [13].

The aetiopathogenesis of acne is complex and includes four factors viz. seborrhea, comedogenesis, inflammation and colonization of intrafollicular duct with *Propionibacterium acnes* [14]. The severity of acne has been divided into 4 grades taking into account the predominant lesions present [15].

Grade 1 – Comedones, occasional papules.

Grade 2 – Papules, comedones, few pustules.

Grade 3 – Predominant pustules, nodules, abscesses.

Grade 4 – Mainly cysts, abscesses, widespread scarring.

Also it may be classified according to the International Consensus Conference Classification system [16,17] as:

Mild – Few to several comedones, pustules, papules, no nodules.

Moderate – Several to many comedones, pustules, papules, and few to several nodules.

Severe – Numerous comedones, pustules, papules, and many nodules.

Androgens play an important role in the development of acne. Conditions, such as polycystic ovarian syndrome, congenital adrenal hyperplasia, and various endocrine tumors, result in a higher circulating level of androgens and are associated with the development of acne vulgaris [18]. Endocrinologic testing is indicated in patients showing signs of hyperandrogenism. In our study appropriate patients were referred to the departments of endocrinology and gynaecology for further investigations and hormonal treatment.

The various treatment options available are topical retinoids, oral retinoids, antibiotics (oral and topical), benzoyl peroxide and hormonal agents and their mechanisms of action are as follows:

- Topical retinoids: Comedolytic and sometimes anti-inflammatory,
- Oral retinoids: Comedolytic, sebosuppressive, antimicrobial, and anti-inflammatory,
- Antibiotics: Antimicrobial and anti-inflammatory.

- Benzoyl peroxide: Antimicrobial plus weakly anti-inflammatory and comedolytic,
- Hormonal agents: Sebosuppressive.

In our study the total male to female ratio found was 1:1.29. A total of 845 patients were seen in the adolescent age group and 365 patients in the adult age group. The male to female ratio in the adult age group was found to be 1:2.35 which corroborates with findings of other studies [9-12] that adult acne is more common in females, whereas the ratio was 1:1.01 in the adolescent age group showing equal prevalence in males and females in this age group.

In our study [Table/Fig-2] we found most number (60%) of patients presenting with grade 2 disease, followed by grade 3 (20.99%), grade 1 (11.98%) and grade 4 (7.02%) disease as compared to a study done in Southern India [19] where out of total 309 patients they had found more of grade 1 acne {186 (60.2%)}, followed by grade 2 {85 (27.5%)}, grade 4 {30 (9.7%)} and grade 3 acne {8 (2.6%)}.

The American academy of dermatologists had published the guidelines for acne management in 2007 [20], where oral isotretinoin was approved only for the treatment of severe recalcitrant nodular acne (i.e., grade 4). But, they also opined that it is useful for the management of lesser degrees of acne that are treatment resistant, or producing either physical or psychological scarring. In our study we found that out of total 3634 drugs prescribed, 1174 (32.31%) prescriptions were for isotretinoin alone, which is almost one-third of the total number of drugs. This shows the inclination of prescriptions towards better patient care by reducing the chances of acne complications.

Regarding the recommendations for oral antibiotics, the American academy of dermatologists [20] proposed that, they should be used for the management of moderate and severe acne and treatment resistant forms of inflammatory acne. Also, they proposed minocycline to be superior to doxycycline in terms of reducing *P. acnes*. The expert committee recommendations for acne management, published in 2006 [21], recommended oral antibiotics to be used only in moderate to severe acne and should not be used as monotherapy. We found a total of 550 (15.13%) prescriptions for oral antibiotics out of total 3634 drugs, showing restriction of their haphazard use and chances of drug resistance. Although minocycline is proposed to be more effective, doxycycline {298 (54.18%} was the most frequently prescribed oral antibiotic in our study. There was not a single prescription of monotherapy with oral antibiotic i.e., either it was co-prescribed with oral isotretinoin, or one or more of the topical formulations.

To summarize the therapeutic options in acne:

- Topical preparations are the mainstay in the management of mild to moderate acne [19].
- The management of moderate to severe acne includes topical retinoids, oral antibiotics, oral isotretinoin, hormonal therapy, and benzoyl peroxide whether alone or in combination with an antibiotic [19].
- Whether mild, moderate or severe, when acne involves scarring and when it becomes psychosocially debilitating, it will require systemic therapy in combination with topical therapy.

CONCLUSION

Adolescence and young adulthood, the age group most impacted by acne, are simultaneously highly receptive to the use of technology and prone to medication noncompliance. Improved treatment adherence could help to diminish the burden of disease itself along with its complications. Oral isotretinoin being the only drug catering to all four pathophysiologic factors contributing to acne, its increasing use in the management of acne has widened the horizon for overall treatment outcome in acne patients.

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