



Original Research Article

A comparative study of Acne Vulgaris with special reference to Therapeutic options

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ARTICLE INFO

Article history:

Received 19-10-2019

Accepted 09-11-2019

Available online 20-12-2019

Keywords:

Tretinoin (0.04%)

Adapalene (0.1%)

Clindamycin (1%)

Benzoyl peroxide (5%)

ABSTRACT

Introduction: Acne vulgaris (AV), a human skin disease and commonly seen in adolescence. Affecting about 80–90% of teenagers in the Western population and lower rate are observed in rural societies. The present study aimed to compare the therapeutic efficacy of various drugs used in different grades of acne accordingly.

Materials and Methods: This study prospective comparative study of forty patients with mild degree of acne were included as group I and 40 patients with moderate degree of acne were considered as group II. Group I patients were divided into Tretinoin (0.04%) group and Adapalene (0.1% gel). Group II patients were divided into Clindamycin (1%) group and Clindamycin 1% gel plus Benzoyl peroxide 5% cream. All these patients were given topical gel as per the dosage schedule over a period of 12 weeks. The change occurred in acne lesions were recorded every 2 weekly follow-up using global assessment improvement scale.

Results: Efficacy and cutaneous tolerance were assessed at baseline and 2,4,6,8,10 and 12 weeks. At the end of 12 weeks treatment, 75% of patients using Tretinoin showed good response to excellent response and 25% patients showed poor to fair response. At the end of 12 weeks treatment, 80% of patients using Adapalene showed good to excellent response. There is no significant difference between two groups. Topical Adapalene is equally efficacious as Tretinoin. At the end of 12 weeks treatment, 45% of patients using only Clindamycin showed good to excellent response. While 90% of patients using both Clindamycin and Benzoyl peroxide showed good to excellent response. Combination of Clindamycin 1% gel with Benzoyl peroxide cream more efficacious than Clindamycin 1% gel alone in reducing the number of lesions in grade 2 acne.

Conclusion: The present study showed there is no significant difference between Adapalene (0.1%) and Tretinoin (0.04%) after 12 weeks of treatment. Significant reduction in number of inflammatory and total lesions were demonstrated in patients using combination therapy (Clindamycin plus benzoyl peroxide) compared with those using only Clindamycin gel in grade 2 acne patients.

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1. Introduction

Acne vulgaris (AV) or simply acne is a human skin disease of the pilosebaceous unit that causes noninflammatory lesions (open and closed comedones), inflammatory lesions (papules, pustules, and nodules), and varying degrees of scarring.¹ Acne affects skin having dense sebaceous follicles in areas including face, chest and back.²

Acne vulgaris may be of two forms- inflammatory and noninflammatory.³ Acne vulgaris is commonly seen in during adolescence and affecting about 80–90% of teenagers in the Western population and lower rate are observed in rural societies.^{4,5} Increased levels of androgens causes Acne and seen mainly during puberty in both genders.⁶ Acne vulgaris reduces over time and tends to disappear over the age.⁷

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The primary pathogenic factors are increased and altered sebum production by the sebaceous gland, alterations in the follicular keratinization process, which lead to comedones, follicular colonization by *Propionibacterium* acnes, and activation of innate immunity followed by increased inflammation.^{8,9} Although acne is not life-threatening condition, many studies have reported the negative impact on quality of life of adults and adolescents.^{10,11}

Currently many treatments are available for acne; guidelines recommend a combination of a topical retinoid and an antimicrobial agent for majority of the patients in order to target inflammatory and non-inflammatory lesions.¹² Acne typically requires prolonged treatment; poor adherence to acne therapies has been documented. Dreno B et al., found poor adherence in 50% of participants prescribed treatment for acne; adherence rates reported in Europe were lower than those reported in the Americas or Asia.¹³ Dissatisfaction with treatment has been closely associated with poor adherence.¹⁴ The present study aimed to compare the therapeutic efficacy of various drugs used in different grades of acne accordingly.

2. Materials and Methods

This study prospective comparative study was conducted in the Department of Skin and Venereal Diseases, SCB Medical College and Hospital, Cuttack, Odisha. Patients visiting the department of Skin & VD at SCB Medical College and Hospital were recruited as study subjects. Total number of patients were 80. The age of the study subjects was 15-25 years of both genders. Forty patients with mild degree of acne consisting of mainly comedones were included as group I and forty patients with moderate degree of acne having mainly papules and pustules were considered as group II. Pregnant or lactating female, hypersensitive to drugs, children below 12 years of age and patients who have received either topical or oral treatment for acne in the past 4 weeks. Group I patients were divided into two groups – Tretinoin group (0.04% gel local application in the night) [Supratret] and Adapalene group (0.1% gel local application in the night) [Apge]. All these patients were given the topical gel as per the dosage schedule over a period of 12 weeks. Group II patients were divided into two groups - Clindamycin (1% gel local application in the morning and evening) [Clear Gel] and Clindamycin 1% gel local application in the morning plus Benzoyl peroxide 5% cream local application in the night [Bengel]. All these patients were given topical gel as per the dosage schedule over a period of 12 weeks. The change occurred in acne lesions were recorded every 2 weekly follow-up using global assessment improvement scale. Response to therapy grading done as, if reduction of lesions >90% as excellent, 60-90% as good response, 30-60% as fair response and <30% as poor response.

3. Results

In the present study, 80 subjects were studied. Patients applied the test materials to the entire facial area in the night, for a period of 12 weeks. Efficacy and cutaneous tolerance were assessed at baseline and 2,4,6,8,10 and 12 weeks. Efficacy was determined counting the no. of inflammatory open and closed comedones as well as global improvement. Cutaneous tolerance was evaluated by erythema, scaling and dryness along with burning and pruritus. Table 1 shows the response of Tretinoin 0.04% Vs Adapalene 0.1% (Table 1 Figure 1 A,B, Figure 2 A,B respectively) and table 2 shows the Clindamycin 1% gel Vs Clindamycin 1% gel and Benzoyl peroxide 5% cream (Table 2 and Figure 3 A,B, Figure 4 A,B respectively).

At the end of 12 weeks treatment, 75 % of patients using Tretinoin showed good response to excellent response and 25% patients showed poor to fair response. At the end of 12 weeks treatment, 80% of patients using Adapalene showed good response to excellent response and 20% patients showed poor to fair response. There is no significant difference in the results between two groups ($p=0.98$). Topical Adapalene is equally efficacious as Tretinoin. Adapalene 0.1% gel is equally efficacious as Tretinoin 0.04% in mild degree of acne. Cutaneous side effects were limited to a mild “retinoid dermatitis” occurring in both treatment groups; however, patients treated with adapalene gel tolerated this therapy significantly better than those treated with tretinoin gel.



Figure 1A

Figure 1B

Fig. 1: 1A and 1B. Shows Before and After Treatment (at 12 weeks) with Tretinoin 0.04% respectively

At the end of 12 weeks treatment, 45% of patients using only Clindamycin showed good to excellent response. While 90% of patients using both Clindamycin and Benzoyl peroxide showed good to excellent response. Treatment with Clindamycin/Benzoyl peroxide demonstrated a significant benefit over other treatments at week 2, highlighted its rapid onset of action. There is a significant difference between the two groups ($p<0.05$). Combination of

Table 1: Tretinoin 0.04% Vs Adapalene 0.1%

At the end of 2 weeks				
Drug	Poor response	Fair response	Good response	Excellent response
Tretinoin (0.04%)	13 (65%)	5 (25%)	2 (10%)	0
Adapalene (0.1%)	8 (40%)	6 (30%)	5 (25%)	1 (5%)
At the end of 4 weeks				
Tretinoin (0.04%)	7 (35%)	10 (50%)	3 (15%)	0
Adapalene (0.1%)	3 (15%)	4 (20%)	10 (50%)	3 (15%)
At the end of 6 weeks				
Tretinoin (0.04%)	4 (20%)	5 (25%)	10 (50%)	1 (5%)
Adapalene (0.1%)	2 (10%)	2 (10%)	10 (50%)	3 (15%)
At the end of 8 weeks				
Tretinoin (0.04%)	3 (15%)	5 (25%)	11 (55%)	1 (5%)
Adapalene (0.1%)	2 (10%)	3 (15%)	8 (40%)	4 (20%)
At the end of 10 weeks				
Tretinoin (0.04%)	2 (10%)	2 (20%)	12 (60%)	2 (10%)
Adapalene (0.1%)	2 (10%)	2 (10%)	9 (45%)	4 (20%)
At the end of 12 weeks				
Tretinoin (0.04%)	2 (10%)	3 (15%)	12 (60%)	3 (15%)
Adapalene (0.1%)	2 (10%)	2 (10%)	12 (60%)	4 (20%)

Table 2: Clindamycin 1% gel Vs Clindamycin 1% gel and Benzoyl peroxide 5% cream

At the end of 2 weeks				
Drug	Poor response	Fair response	Good response	Excellent response
Clindamycin (1%)	11 (55%)	5 (25%)	4 (20%)	0
Clindamycin 1% gel + Benzoylperoxide 5%	7 (35%)	7 (35%)	6 (30%)	1 (5%)
At the end of 4 weeks				
Clindamycin (1%)	9 (45%)	6 (30%)	5 (25%)	0
Clindamycin 1% gel + Benzoylperoxide 5%	5 (25%)	7 (35%)	8 (40%)	3 (15%)
At the end of 6 weeks				
Clindamycin (1%)	7 (35%)	7 (35%)	6 (30%)	0
Clindamycin 1% gel + Benzoylperoxide 5%	4 (20%)	5 (25%)	10 (50%)	1 (5%)
At the end of 8 weeks				
Clindamycin 1% gel + Benzoylperoxide 5%	5 (25%)	6 (30%)	9 (45%)	0
Clindamycin 1% gel + Benzoylperoxide 5%	3 (15%)	3 (15%)	12 (15%)	2 (10%)
At the end of 10 weeks				
Clindamycin 1% gel + Benzoylperoxide 5%	4 (20%)	5 (25%)	10 (50%)	1 (5%)
Clindamycin 1% gel + Benzoylperoxide 5%	3 (15%)	3 (15%)	12 (60%)	2 (10%)
At the end of 12 weeks				
Clindamycin 1% gel + Benzoylperoxide 5%	5 (25%)	6 (30%)	8 (40%)	1 (5%)
Clindamycin 1% gel + Benzoylperoxide 5%	1 (5%)	1 (5%)	15 (75%)	3 (15%)



Figure 2A

Figure 2B

Fig. 2: A,B: Shows Before and After Treatment (at 12 weeks) with Adapalene 0.1% respectively



Figure 4A

Figure 4B

Fig. 4: A,B: Shows Before and After Treatment (at 12 weeks) with Clindamycin 1% gel and Benzoyl peroxide 5% cream respectively

Clindamycin 1% gel with Benzoyl peroxide cream more efficacious than Clindamycin 1% gel alone in reducing the number of lesions in grade 2 acne.



Figure 3A

Figure 3B

Fig. 3: A,B: Shows Before and After Treatment (at 12 weeks) with Clindamycin 1% gel respectively

4. Discussion

Acne vulgaris is a chronic inflammatory disease, characterized by formation of comedones, erythematous papules, pustules, nodules, cysts, abscesses and sometimes widespread scarring developed. According to the severity of acne various topical, systemic and surgical therapies are being used.

In a study by Gollnick H *et al.*, reported that reductions in lesion counts have been reported in the range of 33% to 81% for non-inflammatory lesions, 17% to 71% for inflammatory lesions and 22% to 83% for total lesions. In vehicle-

controlled studies, once-daily tretinoin therapy (0.025% gel and 0.025% cream) reduced all types of acne lesions by 40% to 50%. The original tretinoin formulations were associated with cutaneous irritation, including erythema, desquamation, burning and pruritus.¹⁵ Grosshans E *et al.*, reported that Adapalene offers comparable efficacy to tretinoin, but is less irritating. It represents a good alternative for the treatment of mild to moderate acne vulgaris.¹⁶ Shalita AR and Weiss JS *et al.*, observed that Adapalene gel 0.1% gel applied once daily was significantly more effective in reducing acne lesions and was better tolerated than tretinoin gel 0.025% in the treatment of acne vulgaris.^{17,18} Overall, there was a 49% to 63% mean reduction in lesions among patients receiving adapalene during 12 weeks of treatment, and the majority of patients (80-89%) were considered to have achieved a favorable clinical response. In addition, adapalene was better tolerated than tretinoin at all evaluation periods.

However, in a double-blind 12 week study, Nyirad *et al.*, reported that tretinoin microsphere gel may have a faster onset of action than adapalene. These reported a greater reduction in comedone counts at 4 week with tretinoin versus adapalene; reductions in acne lesions at 12 weeks were similar with the two drugs. In this, tretinoin microsphere gel was associated with an increased incidence of dryness and peeling when compared with adapalene gel.¹⁹ In this study, initial response of tretinoin was seen around 2 weeks of therapy. At the end of 2 weeks 35% patients had fair to good response. While 55% of patients using adapalene had fair to good response in 2 weeks.

At the end of 12 weeks treatment, 75% patients using tretinoin showed good to excellent response and 25% patients showed fair to poor response. At the end of 12 weeks of treatment, 80% patients using adapalene showed good to excellent response and 20% patients showed fair to

poor response. It suggests that adapalene has early onset of action when compared to tretinoin. Topical adapalene is equally efficacious as tretinoin. Cutaneous side effects were limited to a mild “retinoid dermatitis” occurring in both treatment groups; however, patients treated with adapalene gel tolerated this therapy significantly better than those treated with tretinoin gel.

Antimicrobials have been a mainstay of acne treatment for more than 30 years and an active area of research for much of this time. In the past two decades, a substantial armamentarium of topical and systemic agents has been developed and utilized in the treatment of acne. As with all topical medications, the medication should be applied to the entire affected area, usually in the morning and the evening and not only to the visible lesions. Topical antibiotics and benzoyl peroxide are indicated in patients with mild to moderate inflammatory acne.

Warner GT *et al.*, reported that, Clindamycin/benzoyl peroxide gel has demonstrated efficacy and good overall tolerability in several well designed clinical studies in the topical treatment of patients with mild to moderate acne vulgaris. Clindamycin/benzoyl peroxide was more effective than benzoyl peroxide, clindamycin or vehicle and similar in efficacy to benzoyl peroxide/erythromycin in the reduction of inflammatory lesions and in raising physician- and patient- assessed mean global improvement scores. It may be useful in treating patients with acne caused by resistant strains of *Propionibacterium acnes*. Clindamycin/benzoyl peroxide gel is an effective topical agent in the treatment of patients with mild to moderately severe acne. It is a suitable alternative for patients who are currently using topical antibacterials either alone or in conjunction with other topical anti-acne agents or systemic anti-bacterials.²⁰ Leyden JJ *et al.*, reported that improved efficacy obtained with the combination therapy was accompanied by a tolerability profile similar to that of benzoyl peroxide alone, making this new combination product an alternative antimicrobial therapy for acne vulgaris.²¹

In our study, 40% of patients using only Clindamycin had fair to good response in 2 weeks whereas 65% of patients using Clindamycin plus Benzoyl peroxide had fair to good response in 2 weeks. At the end of 12 weeks treatment, 45% patients using only Clindamycin showed good to excellent response. While 90% patients using both Clindamycin and Benzoyl peroxide showed good to excellent response. Combination of Clindamycin with Benzoyl peroxide creams are more efficacious than Clindamycin cream alone in reducing the number of lesions in grade 2 acne. Treatment with Clindamycin/Benzoyl peroxide demonstrated a significant benefit over other treatments at 2 week, highlighting its rapid onset of action. Out of 20 patients, 3 patients using Clindamycin and Benzoyl peroxide had side effects like dryness, scaling and irritation after 6 weeks.

5. Conclusion

The present study showed Adapalene gel produced numerically greater lesion reductions than Tretinoin gel at 2 to 4 weeks of treatment. No significant difference between the two treatments were observed after 12 weeks. Adapalene 0.1% gel was significantly better tolerated than Tretinoin 0.04% gel during the whole treatment period. Hence, Tretinoin 0.04% gel and Adapalene 0.1% gel are equally efficacious in grade 1 acne. Side effects like dryness, erythema, itching was more common with Tretinoin when compared to Adapalene. Significantly greater reductions in the number of inflammatory and total lesions were demonstrated in patients using combination therapy (Clindamycin plus benzoyl peroxide) compared with those using only Clindamycin gel in grade 2 acne patients. Both physicians and patients global evaluations showed significantly greater improvements with the combination therapy than with its individual components. The most frequent adverse effect, dry skin, occurred in the combination treatment groups. Combination of Clindamycin and Benzoyl peroxide works better than Clindamycin gel alone in grade 2 acne patients.

6. Conflict of Interest

None.

7. Source of Funding

None.

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Cite this article: Kumar S, Devi B, Goud V. A comparative study of Acne Vulgaris with special reference to Therapeutic options. *Indian J Clin Exp Dermatol* 2019;5(4):306-311.