

# A comparison of the efficacy of topical adapalene gel 0.1% with tretinoin gel 0.025% in mild acne vulgaris

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## Abstract

**Objective** To compare the efficacy of topical adapalene with topical tretinoin in the treatment of mild acne vulgaris .

**Methods** This randomized controlled trial was conducted over a period of 6 months in outpatient department of dermatology, Lady Reading Hospital, Peshawar. 101 patients were taken after nonprobability consecutive sampling in each group. Topical adapalene 0.1% gel was given to group A while topical tretinoin 0.025% gel was given to group B for once daily application. Efficacy was ascertained after the end of third month and was graded as excellent or poor response. The data were statistically analyzed using SPSS version 11.

**Results** Out of 202 patients, male and female patients were 91 and 111, respectively with male to female ratio 0.8:1. The age of the patients ranged from 15-25 years. Mean age in group A was  $19.79 \pm 2.24$  years while in group B, it was  $20.11 \pm 2.53$  years. Overall efficacy in adapalene group was 84.2% as compared to 39.6% of tretinoin group ( $p=0.000$ ).

**Conclusion** Topical adapalene has a better efficacy than topical tretinoin in the treatment of mild acne vulgaris .

## Key words

Acne, adapalene, tretinoin.

## Introduction

Acne vulgaris is a common inflammatory disorder of the skin that involves pilosebaceous units.<sup>1,2</sup> There is no mortality associated with this disease, but there is significant psychosocial morbidity.<sup>3,4</sup> Acne is most common during adolescence, affecting more than 85% of teenagers.<sup>5,6,7</sup> In older age patients, acne is found more commonly in females than males.<sup>8</sup> The pathogenesis of acne is multifactorial and is

thought to involve excess sebum production, follicular hyperkeratinization, bacterial colonization, and inflammation.<sup>9</sup> Many therapeutic options exist for treating acne including topical benzoyl peroxide, topical and oral antibiotics, topical and oral retinoids and oral contraceptives.<sup>9</sup> Consensus guidelines advocate that the use of topical retinoids are primary treatment for most forms of acne treatment. However, all topical retinoids may be irritating which contribute to their underutilization. Topical adapalene has the advantage of causing less irritation and is more stable molecule than tretinoin.<sup>10</sup> On the basis of previous studies adapalene was thought to have

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superior therapeutic effect to tretinoin, so we hypothesized that adapalene would be better than tretinoin. Since, no local study had been done earlier to compare the efficacy of adapalene and tretinoin, therefore it seemed worthwhile to conduct this study, so that patients are managed effectively.

## **Methods**

This randomized controlled trial was conducted over a period of 6 months in outpatient department of Dermatology, Lady Reading Hospital, Peshawar. Patients were enrolled after getting prior approval from hospital ethical committee. An informed written consent was obtained from every patient. A total of 101 patients presenting to outpatient department of dermatology unit Lady Reading Hospital Peshawar, diagnosed as mild acne vulgaris on the basis of history and examination (<20 black head lesions, or <15 red spots, or <30 total lesions) were included in the study. Patients from 15-25 years of age having mild acne vulgaris on face (lesions count less than 30) were included and patients with previous history of topical therapy in last 2 weeks were excluded in the study. Nonprobability consecutive sampling technique was used to select the patients. Demographic data like age, sex, address were obtained. All the patients of acne vulgaris were randomly allocated into two groups (A and B) by lottery method.

Topical adapalene gel was given to group A to be applied once daily at night. Group B was given topical tretinoin gel to apply once daily at night. Examination of the patient was carried out at presentation and follow-up examination was done after 3 months. Efficacy was assessed as

either excellent (clearance of more than 50% of lesions) or poor response (clearance of less than 50% of lesions) to the treatment at the end of three months treatment.

The statistical analysis was performed using SPSS 11 version. Frequencies and percentage were calculated for gender and efficacy on follow-up. Mean  $\pm$  standard deviation was calculated for age of the patients. Chi-square test was applied to compare the efficacy of both drugs. p-value of less than or equal to 0.05 was considered as significant.

## **Results**

A total of 202 patients were included in the study. Total numbers of enrolled male and female patients were 91 and 111, respectively with male to female ratio 0.8:1. The age of the patients ranged from 15-25 years. In both groups, A and B, the female patients outnumbered male patients. Mean age in group A was  $19.79 \pm 2.24$  years while in group B it was  $20.11 \pm 2.53$  years. The response rate of both groups was better in younger age (14-21 years) as compared to older age (22-25 years). However statistically this difference was not significant with p-value of 0.420 (**Table 1**). The efficacy of both groups was better in female patients as compared to male patients but statistically not significant with p-value of 0.702 (**Table 2**). When patients in adapalene group were compared with tretinoin group in number of lesions improved, the efficacy in number of lesions was not significant in both groups with p-value of 0.350. Overall efficacy in adapalene group was 85 (84.2%) as compared to tretinoin group 40 (39.6%) with statistically significant p-value of 0.000 (**Table 3**).

**Table 1** Response rate in different age groups (A=adapalene, B=tretinoin).

Age (years)	Efficacy		Total	p-value
	Yes	No		
< 17	26 (20.8%)	11 (14.3%)	37 (18.3%)	0.420
18 – 21	66 (52.8%)	47 (61.0%)	113 (55.9%)	
≥ 22	33 (26.4%)	19 (24.7%)	52 (25.7%)	

**Table 2** Efficacy according to gender in both groups (A=adapalene, B=tretinoin).

Sex	Efficacy		Total	p-value
	Yes	No		
Male	55 (44.0%)	36 (46.8%)	91 (45.0%)	0.702
Female	70 (56.0%)	41 (53.2%)	111 (55.0%)	

**Table-3** Graded efficacy in both groups (A=adapalene, B=tretinoin).

Efficacy	Efficacy		Total (n=202)	p-value
	Group A (n=101)	Group B (n=101)		
Yes	85 (84.2%)	40 (39.6%)	125 (61.9%)	0.000
No	16 (15.8%)	61 (60.4%)	77 (38.1%)	

## Discussion

Topical retinoids are the primary treatment option for most types of acne vulgaris.<sup>10</sup> Our study focused on evaluation of efficacy of a relatively new drug adapalene, that is a third generation retinoid, and tretinoin, that belongs to first generation retinoid. The rationale of using topical retinoids in mild acne vulgaris, as compared to topical or oral antibiotics is due to the fact that antibiotics are associated with bacterial resistance and other unwanted systemic side effects.

Iftikhar *et al.*<sup>11</sup> compared the efficacy and safety of topical 0.1% adapalene and 4% benzoyl peroxide in the treatment of mild to moderate acne vulgaris. They observed that the prevalence in female patients was more as compared to male patients in both groups. We noticed a similar trend in our study as well. The reason for similarities of high prevalence in females in both the studies could be that females are more worried about their facial appearance. Therefore, they seek advice earlier for the treatment of their acne as compared to males. They observed that the majority of patients were in second decade of their lives. We observed similar finding in our study. There are two reasons for this. Firstly our

study designs were almost similar and patients included in both the studies had age range from 15-25 yrs. Since acne is more commonly seen in teenage patients and it persists in twenties, therefore, the numbers of enrolled patients were more in the second decade of their lives.<sup>11</sup> Secondly, populations in both studies shared the same genetic makeup.

In the afore-mentioned study efficacy in adapalene group was excellent in 78% while in our study it was 84.2%. The reason for almost similar efficacy in both groups could be that patients with similar grade of acne were treated with similar concentration of adapalene. Therefore, the results of the two studies were almost similar.

Campbell *et al.*<sup>12</sup> conducted a prospective open label, multicenter study to evaluate effectiveness and safety of adapalene gel along with other acne treatments. They observed that adapalene gel was more effective in clearing both inflammatory and noninflammatory acne lesions of moderate acne. Their patients were mostly females. In our study enrolled patients were also mostly females in both groups with mean age in second decade of life. These findings are similar because acne commonly starts in twenties in

females. The similar findings between our study and the referred study could be due to the fact that in both the studies the included patients are those of mild to moderate acne vulgaris.

Our study showed that efficacy of topical adapalene is superior to topical tretinoin in reducing both inflammatory and noninflammatory lesions in mild acne vulgaris. This finding is similar to a multicenter randomized investigator-blinded trial in which 105 patients with mild to moderate acne vulgaris on face were treated with adapalene 0.1% gel versus tretinoin 0.25% gel for 3 months, conducted by Groshans *et al.*<sup>13</sup> Adapalene gel was found to be more efficacious than tretinoin gel after 1 week of treatment, with decreased inflammatory lesions by 32% and 17%, respectively at the end of one week. They further observed that total lesion counts were reduced to 28%. The response in both groups was not significant at 3 months in both groups. The advantages of our study were large sample size that is 202 and great response at 3 months follow-up. The reason for better response at 3 months in our study might be due to the fact that our patients adhered to the adapalene treatment despite minimal side effects, for three months, so response was better as compared to the referred study, while in referred study patients mostly discontinued treatment before completion of 12 weeks study duration due to side effects that most of the patients observed during early course of study.

In our study adapalene showed an excellent efficacy in 84.2% of the patients. Although, it was effective in both inflammatory and noninflammatory lesions, the noninflammatory lesions showed a more rapid reduction, proving the superiority of adapalene in the treatment and maintenance of reduction of comedonal acne. Similar results were observed by Thieltz *et al.*<sup>14</sup> who assessed the capacity of adapalene gel to

control the microcomedones during 12 weeks of maintenance treatment.

## Conclusion

Adapalene is overall having a better efficacy than tretinoin in the treatment of mild acne vulgaris, in age range of 15-25 years. More randomized controlled trials are needed to determine optimal dose, duration and different strengths of adapalene in the treatment of acne vulgaris.

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