

# Comparison of the Effect of Azelaic Acid 20% And Clindamycin 1% In the Treatment of Mild And Moderate Acne

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## Abstract

**Introduction:** Topical antimicrobials, such as clindamycin, are effective in the treatment of acne and azelaic acid, due to the lack of bacterial resistance, could be a useful alternative in topical treatment of acne. The aim of this study was to compare the effect of topical azelaic acid 20% with clindamycin 1% lotion for the treatment of acne.

**Method:** This randomized clinical trial study was performed on 108 patients with mild and moderate acne. Patient were randomly assigned to one of the two groups of treatment with azelaic acid 20% cream (50 patients) or clindamycin 1% lotion (58 patients). The patients were evaluated by grading and lesion counting methods before treatment and one month and two months after the treatment.

**Results:** The mean age of the patients in clindamycin group and azelaic acid was  $19.6 \pm 3.9$  and  $20.3 \pm 4.5$  years, respectively ( $P=0.41$ ). The mean score of acne severity decreased after treatment according to grading and lesion counting methods ( $P<0.05$ ). Reduction of acne severity score between two group was not significant in second and third visit compared to before treatment ( $P>0.05$ )

**Conclusion:** Result showed that the azelaic acid 20% topical cream was as effective as clindamycin 1% lotion for treating mild to moderate acne. (*Iran J Dermatol 2009;12: 106-110*)

**Keywords:** clindamycin, azelaic acid, acne, treatment

## Introduction

Acne is a disease of pilosebaceous units in the skin. It is thought to be caused by the interplay of four factors: 1) sebum production by the sebaceous gland; 2) colonization of the hair follicle by *P. acnes*; 3) hyperkeratinization of the upper follicle; and 4) the release of inflammatory mediators into the skin<sup>1-2</sup>.

As a polymorphic disease, acne has two patterns. The first pattern is essentially a non-inflammatory disease, inducing hyperseborrhea and the formation of micro-comedones, considered as the first elementary lesion of acne, open comedones and closed comedones. The second clinical pattern is an inflammatory disease, by formation of papules, pustules, nodules and cysts or any combination of them<sup>3-4</sup>.

There is also a grading scale delineating three levels of acne: mild, moderate, and severe. Mild acne is characterized by the presence of few to

several papules and pustules, but no nodules. Patients with moderate acne have several to many papules and pustules, along with a few to several nodules<sup>1</sup>.

For mild to moderate inflammatory acne, topical therapy may be sufficient and minimizes potential adverse effects associated with the use of systemic agents<sup>5</sup>. Topical antibiotics such as clindamycin are the mainstay of acne treatment. These agents reduce the amount of *P. acnes* and may also have anti-inflammatory properties by inhibiting neutrophil chemotaxis<sup>6</sup>.

However, according to estimates, 1 in 4 patients with acne may have strains of *P. acnes* that are resistant to tetracycline, erythromycin, and clindamycin<sup>7</sup>.

In order to improve the efficacy of treatment of acne vulgaris, new agents such as azelaic acid have become available. Azelaic acid is a naturally occurring dicarboxylic acid. It possesses bacteriostatic properties in vitro against a variety

**Table 1.** Mean and variance of the scores of acne severity grade for both groups in all visits, before and after treatment

Group	Time	Number	Mean $\pm$ Variance	P-value
Clindamycin	Before treatment	46	15 $\pm$ 6.4	0.000
	After one month	46	12 $\pm$ 5.9	
	After two months	46	10.6 $\pm$ 6.1	
Azelaic acid	Before treatment	41	16.9 $\pm$ 5	0.000
	After one month	41	14.4 $\pm$ 5.3	
	After two months	41	12.2 $\pm$ 5.2	

**Table 2.** Mean and standard deviation of the reduction in scores of acne severity grade in the second and third visits compared to pre-treatment values in the two studied groups

Reduction	Group	Mean $\pm$ Variance	Number	P-value
Reduction in the second visit compared to the pre-treatment value	Clindamycin	2.9 $\pm$ 3.8	58	0.708
	Azelaic acid	3.2 $\pm$ 4.2	50	
Reduction in the third visit compared to the pre-treatment value	Clindamycin	4.3 $\pm$ 3.6	46	0.654
	Azelaic acid	4.7 $\pm$ 3.7	41	

of aerobic and anaerobic microorganisms, including *P.acnes* and *Staphylococcus epidermidis*. Two to 3 months of treatment with azelaic acid can reduce follicular microbial colonization by more than 97%. Azelaic acid does not seem to induce microbial resistance, even with prolonged exposure. In addition to antimicrobial properties, azelaic acid has a significant ability to normalize keratinization. It also decreases superoxide anion and hydroxyl radical generation by neutrophils, which may contribute to its ability to reduce inflammation. It is associated with a low rate of adverse effects, the most common being local itching and burning sensations<sup>5-8</sup>.

## Patients and Methods

This randomized clinical trial was conducted between 2006 and 2008 on patients with the mild and moderate acne vulgaris on the face. Patients of both gender from the second to fifth decade of age were divided into two major groups, the first group (60 patients, 2 of them were excluded from the study because of loss of follow-up) was treated by clindamycin 1% lotion, twice daily and the second group (60 patients, 10 of them were excluded from

the study because of loss of follow-up) were treated by azelaic acid 20% cream twice daily.

Then, the patients were evaluated by a dermatologist and the severity of acne was assessed and its grade and also therapeutic effects were recorded in a prepared questionnaire using two main systems, grading and lesion counting. Patients were examined in three stages: initial assessment at the first visit before treatment, one month after treatment, and finally two months after treatment. Exclusion criteria included pregnancy and breastfeeding and loss of follow-up.

We used both main techniques for assessing acne severity, i. e. grading and lesion counting, to improve the accuracy of result evaluation. Grading was done by the Global Acne Grading System (GAGS) devised by Doshi et al<sup>9</sup>. The GAGS considers five locations on the face, with a factor for each location (Forehead 2, Right or left cheek 2, Nose 1, Chin 1). Each of the five locations is graded separately on a 0-to-4 scale, with the most severe lesion (0: No lesion, 1:  $\geq$  one comedone, 2:  $\geq$  one papule, 3:  $\geq$  one pustule, 4:  $\geq$  one nodule) within that location determining the local score. The global score is summation of all local scores<sup>10</sup>. Selection of

**Table 3.** Mean and standard deviation of the score of acne severity according to the number of lesions in each stage, before and after treatment in both two groups

Group	Lesion	Number of samples	Time			P-value
			Before treatment Mean±SD	After one month Mean±SD	After two months Mean±SD	
Clindamycin	Black head	46	5.1±8	3.8±6.6	4.3±6.5	0.000
	White head	46	6.6±6	4.5±4.1	3.8±3.4	0.000
	Papule	46	9.2±8.1	5.9±4.2	5±3.8	0.000
	Pustule	46	5.7±5.3	4.6±4.8	4±4.4	0.000
	Sum	46	26.7±15.3	19±10.1	16.2±9.7	0.000
Azelaic acid	Black head	41	6.1±8.1	3.9±5.6	2.3±4	0.000
	White head	41	6.1±5.5	4.2±3.7	3.3±3.3	0.000
	Papule	41	6.7±5.8	5.2±3.8	4±3.1	0.000
	Pustule	41	3.2±1.9	2.3±1.4	1.6±1.8	0.000
	Sum	41	22.3±12.3	15.6±8.9	11.3±9	0.000

**Table 4.** Mean and variance of the reduction in the total number of lesions in the second and the third visit compared to pre-treatment values in the two studied groups

Reduction	Group	Number	Median	Mean±SD	P-value
Reduction in second visit comparing with before treatment	Clindamycin	58	5	7.7±12.3	0.507
	Azelaic acid	50	6	9.1±12.3	
Reduction in third visit comparing with before treatment	Clindamycin	46	7.5	10.5±13.6	0.283
	Azelaic acid	41	9	10.9±10	

the patients was done only in the dermatology clinic.

### Ethical consideration

Before entering the study, all patients signed the provided written informed consent.

### Statistical analysis

Collected data were analyzed using SPSS 15 applying repeated measure test, t-test, Fridman, Mann-whitney test. P-values ≤0.05 were considered significant. To ensure the normal distribution of the samples, we used Kolmogorov-smirnov test and depicted the histogram and found that only the scores obtained from the grading system were normally distributed but the lesion counts did not follow a normal distribution.

### Results

One hundred and eight acne patients entered our survey, all suffering from mild to moderate acne

vulgaris of the face. Fifty cases were treated with azelaic acid 1% cream and the other 58 were treated with clindamycin 1% lotion. Mean age of the patients was 19.6±3.9 for the clindamycin group and 20.3±4.5 for the azelaic acid group (P=0.41). According to gender, patients in the clindamycin group (14 males (24.1%) and 44 females (75.9%)) and the azelaic acid group (12 males (24%) and 38 females (76%)) were normally distributed. Table 1 shows that the mean score of acne severity grade significantly decreased in both groups. Table 2 illustrates that the reduction in the score of the acne severity grade in the second and third visits compared to the pre-treatment value did not show a significant difference between the two groups. Table 3 shows that after treatment, the mean number of lesions decreased significantly in both groups and table 4 illustrates that the reduction in the number of lesions in the second and third visits compared to pre-treatment values did

not show a significant difference between two groups.

## Discussion

The present study was conducted aiming to compare the therapeutic effect of topical azelaic acid 20% and clindamycin 1% lotion in the treatment of mild to moderate acne. Our results showed that the mean grade of acne severity dropped significantly after treatment in both groups. Although the reduction of the acne severity score according to the grading technique in the second and third visit compared to pre-treatment values in the azelaic acid group was more than the same reduction in clindamycin group, this difference was not statistically significant. In other words, the therapeutic effect assessed by the grading system did not show a significant difference between the two studied groups. Also, we found that the lesion count of closed comedones, open comedones, papules and pustules reduced in patients who received azelaic acid, similar to those who were treated with clindamycin. In several studies, the therapeutic effect of azelaic acid was compared to other topical remedies for acne treatment. 15% azelaic acid gel was clinically tested against 5% benzoyl peroxide (BPO) gel and against 1% clindamycin gel in a 4-month period by Gollnick et al. Azelaic acid 15% gel proved to be as effective as BPO and clindamycin with a median reduction of the inflamed lesions (papules and pustules)<sup>11</sup>. In Gibson's study, azelaic acid 20% cream (AZELEX) was broadly comparable in efficacy to 0.05% tretinoin, 5% benzoyl peroxide, and 2% erythromycin, but was less irritating than tretinoin and benzoyl peroxide<sup>12</sup>. Spellman conducted a 12-week study of the efficacy, safety, and tolerability of azelaic acid 20% cream and glycolic acid lotion compared to tretinoin 0.025% cream and a vehicle lotion to treat mild-to-moderate facial acne vulgaris. Patients treated with azelaic/glycolic acid experienced a significantly greater reduction in the number of papules, as well as a greater reduction in the number of inflammatory lesions, than those treated with tretinoin. Treatment with azelaic/glycolic acid was also found to cause significantly less dryness, scaling, and erythema than tretinoin. Patients also reported significantly less dryness, redness, and peeling with azelaic/glycolic acid<sup>13</sup>. Comparisons with clinically proven therapies have shown that 20% AzA cream is an effective monotherapy in mild to moderate forms of acne, with an overall efficacy comparable to that of tretinoin 0.05%, benzoyl

peroxide 5%, and topical erythromycin 2%<sup>14</sup>. 20% azelaic acid cream was compared clinically with its vehicle in a study on 92 patients with moderate inflammatory acne. Also, in another study on 289 patients with comedonal acne, topical azelaic acid preparation was compared with 0.05% tretinoin cream by Katsambas et al. In both controlled studies, 20% azelaic acid cream significantly reduced the number of acne lesions. Azelaic acid cream was significantly and substantially more effective than its vehicle. In the study of comedonal acne, 20% azelaic acid cream was equally effective as 0.05% tretinoin cream in reducing the number of comedones with respect to overall response. However, azelaic acid cream was better tolerated, causing fewer local side effects than the topical retinoid<sup>15</sup>. Irajil's study showed that 20% azelaic acid gel was 3.04 times more effective than placebo in the reduction of total lesion count and was 3.06 times more effective than placebo in reducing acne severity index in mild to moderate acne patients<sup>16</sup>. Azelaic acid 20% cream is also effective when combined with 15% and 20% glycolic acid lotions, as this combination therapy has been demonstrated to be at least as effective as 0.025% tretinoin cream in reducing lesion count and overall improvement. In fact, this combination produces less irritation than 0.025% tretinoin cream<sup>5</sup>.

Comparison between our results and other studies illustrates that azelaic acid could be used as monotherapy or in combination with other drugs in the treatment of mild to moderate acne and even if it is prescribed as monotherapy, it would be as effective as clindamycin in the treatment of acne.

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