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Original Article

Comparison of efficacy of topical tazarotene with topical adapalene in the treatment of facial acne vulgaris

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Abstract

Background Acne is characterized by chronic inflammation of pilosebaceous units. It is characterized by seborrhea, comedones, papules, pustules, nodules, pseudocysts that may lead to scar formation.[1] Types of acne include acne vulgaris, acne fulminans, acne conglobata, occupational acne, prepubertal acne. Acne commonly affects adolescents and adults; affecting more than 85% of adolescents.[2] This study will give us local statistics of efficacy of topical adapalene vs. topical tazarotene for treating facial acne vulgaris and the results of this study will be used as evidence for future research and treatment recommendations for facial acne vulgaris.

Objective Comparison of efficacy of topical tazarotene vs. topical adapalene for treating facial acne vulgaris.

Methods In this study 44 patients were included in each group. In group A, patients were subjected to topical tazarotene gel (0.1%) thrice daily for 4 weeks (amount pea size) while patients in group B were subjected topical adapalene gel (0.1%) three times a day for 4 weeks (amount pea size). All patients were followed 4 weeks after start of therapy. Treatment was considered effective if there is at least 50% reduction in number of lesions from baseline.

Results In Group A mean age was 28±12.15 years while in Group B mean age was 26±11.84 years. There were 18 (41%) males and 26 (59%) females in Group A and there were 17 (39%) males and 27 (61%) females in Group B. Tazarotene gel was effective in 29 (66%) patients while adapalene gel was effective in 27 (61%) patients.

Conclusion Our study concludes that topical tazarotene gel was more effective than topical adapalene (66% vs. 61%) in the treating facial acne vulgaris.

Key words
Tazarotene gel, adapalene gel, facial acne vulgaris.

Introduction

Acne is characterized by chronic inflammation of pilosebaceous units. It is characterized by comedones, pustules, papules, nodules, pseudocysts that may lead to scarring.[1] Various types of acne include acne vulgaris, acne conglobata, acne fulminans, occupational acne, prepubertal acne. It is most commonly seen in adolescents and adults; affecting more than 85 % of adolescents.[2] Acne is one of those skin disorders that cause physical trauma, feeling of inferiority, insecurity and thus becoming one of today's biggest worries especially for females. Hence the management of acne at the earliest period has become the matter of importance.[3]

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Various tools for assessment of acne vulgaris are available that take into account factors like type of acne, number of lesions, severity of lesions, scarring, quality of life and other measures.[4] The choice of topical therapy depends upon disease severity and extent. Treatment involves either topical therapies alone or combination of topical therapies with oral agents.[5] Topical agents that are commonly use include benzoyl peroxide alone or with antibiotics or retinoids or combination of retinoids with antibiotics.[6] Efficacy and safety of topical retinoids is well established both for inflammatory and noninflammatory acne with many studies showing significant improvement in acne severity.[7]

Adapalene is a topical retinoid used for treating acne vulgaris, alone or with other antiacne topicals.[8] Tazarotene belongs to the class of retinoids that is activated in skin and plasma by rapid desertification. Tazarotene in strength of 0.1% is FDA approved for treating acne vulgaris in patients of 12 years age and older.[9,10] The reported efficacy of topical adapalene for treating acne vulgaris is 56%[11] and 23.4%.[12] The reported efficacy of topical tazarotene for treating acne vulgaris in terms of lesion clearance of more than 50% is reported to be 63.3%[12] and 30%.[13]

The aim of the present study was comparison of efficacy of topical adapalene vs. topical tazarotene for treating mild and moderate facial acne vulgaris. Retinoids are marketed throughout the world for treating facial acne vulgaris however, the efficacy of these topical medications vary from one population to another. This may be due to the cause of acne vulgaris which varies from one population to another. This study will give us local statistics of efficacy of adapalene and tazarotene in treating facial acne vulgaris and the results of our study will be used as evidence for future research and treatment recommendations for facial acne vulgaris.

Methods

This randomized controlled trial was conducted in Dermatology Department of Lady Reading Hospital, Peshawar from January 2019 to June 2020 over period of 06 months after getting approval from hospital ethical review board. Data was collected by non-probability consecutive sampling from 88 patients (44 in each group). WHO sample size calculation formula was used to calculate sample size. Patients of either gender, age range 18-40 years having Grade 1 and 2 facial acne vulgaris were included in the study. Patients who have used topical steroids in last week, patients already receiving any other treatment for acne vulgaris, or patients with inflamed acne lesions as suggested by pain or fever on history were excluded from the study. A written informed consent was obtained from all patients. Lottery method was used to randomly allocate the patients in two groups. In group A patients were subjected to topical tazarotene gel (0.1%) three times a day for 4 weeks (amount pea size) while patients in group B were subjected topical adapalene gel (0.1%) three times a day for 4 weeks (amount pea size). 15 minutes after wash the five with gentle non soap cleanser.

All patients were followed at the end of 4 weeks after start of therapy. Treatment was considered effective if there is at least 50% reduction in number of lesions. A scale of 0 to 4 was used to assess the efficacy. Interpretation of scale is as follows.

0 Complete clearance (100% clearance of lesions).
1 Marked improvement (> 75% clearance of lesions).
2 Moderate improvement (50-75% clearance of

lesions).
3 Mild improvement (25-50% clearance of lesions).
4 Insignificant improvement (<25% clearance of lesions).

All the information including name, age, gender, activities, number of lesions at baseline and number of lesions after 4 weeks follow-up was recorded in a pre-designed proforma.

Data analysis

SPSS version 23 was used for data analysis. Frequencies and percentage were calculated for categorical variable like gender, activities and efficacy. Mean±SD were calculated for scale variables like age, number of lesions at baseline and number of lesions after 4 weeks of follow up. Chi square test was applied for comparison of efficacy in both the groups and p value of ≤0.05 was taken as significant. Efficacies in both the groups were stratified among the age, gender and activities. All the results were presented as tables.

Results

Our study shows that in tazarotene gel Group (A) n=32 (73%) patients were in 18-25 years age range, n=12 (27%) patients were in 26-40 years age range. Mean age was 28±12.15 years. Where as in adapalene gel Group (B) n=33 (75%) patients were in 18-25 years age range, n=11 (25%) patients were in 26-40 years age range. Mean age was 26±11.84 years **(Table 1)**.

Table 1 Age.

Age (years)	*Tazarotene gel; Group A (n=44)*	*Topical Adapalene gel; Group B; (n=44)*	*P Value*
18-25	32 (73%)	33 (75%)	0.8083
26-40	12 (27%)	11 (25%)	
Total	44	44	
Mean±SD	28±12.15 years	26±11.84 yars	0.4364

Table 2 Gender.

Gender	*Tazarotene gel; Group A; (n=44)*	*Topical Adapalene gel; Group B; (n=44)*	*P Value*
Male	18 (41%)	17 (39%)	0.8275
Female	26 (59%)	27 (61%)	
Total	44	44	

Table 3 Activitis.

Activities	*Tazarotene gel; Group A; (n=44)*	*Topical Adapalene gel; Group B; (n=44)*	*P Value*
Indoor	20 (45%)	21 (48%)	0.8307
Outdoor	24 (55%)	23 (52%)	
Total	44	44	

Table 4 Number of lesion.

No. of lesion (Baseline)	*Tazarotene gel; Group A; (n=44)*	*Topical Adapalene gel; Group B; (n=44)*	*P Value*
50-70%	15 (34%)	16 (36%)	0.8234
71-90%	29 (66%)	28 (64%)	
Total	44	44	
Mean± SD	20±7.08	21±6.11	0.4801

In tazarotene gel Group (A) n=18 (41%) patients were male and n=26 (59%) patients were female. Whereas in adapalene gel Group (B) n=17 (39%) patients were male and n=27 (61%) patients were female **(Table 2)**. In tazarotene gel Group (A) n=20 (45%) patients had indoor activities while n=24 (55%) patients had outdoor activities. Whereas in adapalene gel group (B) n=21 (48%) patients had indoor activities while n=23 (52%) patients had outdoor activities **(Table 3)**. In tazarotene gel Group (A) n=15 (34%) patients had 50-70% lesions while n=29 (66%) patients had 71-90% lesions (at baseline). Mean number of lesions were 20±7.08. Where as in topical adapalene gel Group (B) n=16 (36%) patients had 50% to 70% lesions while n=28 (64%) patients had 71-90% lesions (at baseline). Mean number of lesions were 21±6.11 **(Table 4)**. Number of lesions on follow up was analyzed as tazarotene gel Group (A) 29 (66%) patients had ≤50 lesions while 15 (34%) patients had >50 lesions. Mean number of lesions were 8±2.74. Where as in topical adapalene gel

Table 5 Number of lesion.

No. of lesion 4 weeks follow up	*Tazarotene gel; Group A; (n=44)*	*Topical Adapalene gel; Group B; (n=44)*	*P Value*
≤ 50	29 (66%)	27 (61%)	0.6576
>50	15 (34%)	17 (39%)	
Total	44	44	
Mean± SD	8±2.74	10±2.93	0.0014

Table 6 Efficacy.

Efficacy	*Tazarotene gel; Group A; (n=44)*	*Topical Adapalene gel; Group B; (n=44)*	*P Value*
Effective	29(66%)	27(61%)	0.6576
Not effective	15(34%)	17(39%)	
Total	44	44	

Group (B) 27 (61%) patients had ≤50 lesions while 17 (39%) patients had >50 lesions. Mean number of lesion were 10±2.93 **(Table 5)**. Tazarotene gel Group (A) was effective in 29 (66%) patients while topical adapalene gel Group (B) was effective in 27 (61%) patients **(Table 6)**. Stratification of efficacy w.r.t. age, gender, activities is given in **Table 7-9**.

Discussion

Acne is characterized by chronic inflammation of pilosebaceous units. It is characterized by seborrhea, comedones, papules, pustules, nodules, pseudocysts that may lead to scaring.[1] Various types of acne include acne vulgaris, acne conglobata, acne fulminans, occupational acne, prepubertal acne. It most commonly affects adolescents and adults; affecting more than 85% of adolescents.[2] Acne is one of those skin disorders that cause physical trauma, feeling of inferiority, insecurity and thus becoming one of today's biggest worries especially for females.

Table 7 Stratification of efficacy with respect to age.

Age	*Efficacy*	*Tazarotene gel Group A*	*Topical adapalene gel Group B*	*P value*
18-25 years	Effective	21	20	0.6750
	Not effective	11	13	
Total		32	33	
26-40 years	Effective	8	7	0.8788
	Not effective	4	4	
Total		12	11	

Table 8 Stratification of efficacy with respect to gender.

Gender	*Efficacy*	*Tazarotene gel Group A*	*Topical adapalene gel Group B*	*P value*
18-25 years	Effective	21	20	0.6750
	Not effective	11	13	
Total		32	33	
26-40 years	Effective	8	7	0.8788
	Not effective	4	4	
Total		12	11	

Table 9 Stratification of efficacy with respect to activities.

Activities	*Efficacy*	*Tazarotene gel Group A*	*Topical adapalene gel Group B*	*P value*
Indoor	Effective	13	13	0.8370
	Not effective	7	8	
Total		20	21	
Outdoor	Effective	16	14	0.6792
	Not effective	8	9	
Total		24	23	

Hence the management of acne at the earliest period has become the matter of importance.[3]

In our study the mean age in tazarotene gel Group was 28±12.15 years and mean age in topical adapalene gel Group was 26±11.84 years. In tazarotene gel Group (A) n=18 (41%) patients were male and n=26 (59%) patients were female. Where as in topical adapalene gel Group (B) n=17 (39%) patients were male and n=27 (61%) patients were female. Tazarotene gel Group (A) was effective in 29 (66%) patients while topical adapalene gel Group (B) was effective in 27 (61%) patients.

In another study by Tanghetti E *et al.*[14] showed that those patients subjected tazarotene 0.1% cream had more reduction in lesion counts, more improvement in disease severity than patients who were subjected to adapalene 0.3% gel. Tazarotene 0.1% cream showed significant reduction in post inflammatory hyperpigmentation as compared to adapalene 0.3% gel (P≤0.018). In conclusion, tazarotene 0.1% cream and adapalene 0.3% gel both were effective in patients with moderate acne. Tazarotene 0.1% cream was more effective in reducing acne lesions and post inflammatory pigmentation.

In another study conducted by Webster GF *et al.*[15] efficacy and safety of adapalene 0.1% gel and tazarotene 0.1% gel were compared in 145 patients with mild-to-moderate facial acne vulgaris. Both topical agents were use once daily for 12 weeks. Tazarotene was more effective as compared to adapalene (78% vs. 52%; P=.002). By the end of treatment, according to patients both therapies were well tolerated (76% with tazarotene and 69% with adapalene).

Similar results were observed in several studies as in study conducted by Khurshid K *et al.*[16] had reported that the adapalene 0.1% gel was found effective in 56% of patients with facial acne vulgaris.

In another study conducted by Swaroop MR *et al.*[17] had reported that at the 4th week of post treatment evaluation 63.3% in tazarotene 0.1% gel had 50-75% clearance of lesion as compared to 23.4% lesion clearance in those patients on adapalene 0.1% gel (p=0.002).

In another study conducted by Rahman MH *et al.*[18] had reported that 30% of patients with acne vulgaris in the tazarotene group showed excellent response at 8th follow up week.

Conclusion

Our study concludes that topical tazarotene gel was more effective than topical adapalene (66% vs. 61%) in the treatment of facial acne vulgaris.

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