THE EFFICACY OF TOPICAL METFORMIN VERSUS ADAPALENE IN PATIENTS WITH MILD AND MODERATE ACNE VULGARIS

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Introduction

Acne vulgaris is one of the most common skin disorders in which various factors are involved in its pathogenesis. The major pathogenic factors involved are hyperkeratinization, obstruction of sebaceous follicles resulting from abnormal keratinization of the infundibular epithelium, stimulation of sebaceous gland secretion by androgens, and microbial colonization of pilosebacous units by propionibacterium acnes which promote perifollicular inflammation .

Investigations of intracellular signaling pathway suggested that over expression of mTORC1 complex leads to increased sebum production and altered keratinization; therefore it has an important role in acne pathogenesis. Although metformin is an antidiabetic drug , it has been found to play an important role in a number of cutaneous disorders . Metformin is able to suppress m TORC over expression through AMPK (adenosine monophosphate activated 4. protein kinase) activation , so applying it topically on acne lesions may lead to relief of symptoms.

Aim of the work

To investigate the effect of topical metformin alone, topical adapalene alone compared with combination of topical metformin and adapalene in patients with mild to moderate acne vulgaris.

Patients and Methods

Patients :

45 patients aged above 18 years of both genders diagnosed as mild to moderate acne vulgaris were divided into three groups with 15 patients in each group.

Group A patients were treated with topical metformin twice daily for 3 months ,group B patients were treated with topical adapalene once daily for 3 months and group C patients were treated with topical metformin and topical adapalene once daily(on alternate days) for three months

Methods :

The severity of acne was assessed according to global acne grading system (GAGS) initially at week 0, and monthly (at week 4, week 8 and week 12). Body weight, body fat and Homeostatic Model Assessment of Insulin Resistance (HOMA-IR) were measured in all patients and correlated to the results.

Results

Table 1 demonstrated statistically significant difference among the three studied groups concerning the GAG score after treatment demonstrating that group B had the highest range of score (2-13) , and the lowest reduction percentage (28.57-75%), compared to groups A and C. A statistically significant difference was recorded among the three studied groups concerning the GAG score after treatment compared to the GAG score before treatment (the reduction percentage) demonstrating that group C had the highest reduction percentage (75%) followed by group A (71.43%) and the least in group B (60%). (P1=0.001, P2=0.998, and P3=0.001, respectively)

Table (1): Comparison between the three studied groups according to GAG Score

GAG Score	Group A (n = 15)	Group B (n = 15)	Group C (n = 15)	Test of Sig.	p
Before					
Min. – Max.	6.0 – 19.0	7.0 – 22.0	4.0 – 25.0	H= 3.740	0.154
Mean ± SD.	12.33 ± 3.68	16.27 ± 5.30	12.80 ± 7.03		
Median (IQR)	12.0 (10.50 – 14.0)	18.0 (11.0 – 20.0)	10.0 (8.0 – 20.0)		
After					
Min. – Max.	2.0 – 5.0	2.0 – 13.0	0.0 – 12.0	H= 13.992*	0.001*
Mean ± SD.	3.13 ± 0.99	7.40 ± 3.29	3.73 ± 3.45		
Median (IQR)	3.0 (2.50 – 3.50)	8.0 (4.50 – 10.0)	2.0 (2.0 – 5.0)		
Sig. bet. grps.	p_1=0.002*,p_2=0.866,p_3=0.001*				
Z (p_0)	3.423* (0.001*)	3.433* (0.001*)	3.417* (0.001*)		
% reduction					
Min. – Max.	64.29 – 84.21	28.57 – 75.0	50.0 – 100.0	F= 11.143*	<0.001*
Mean ± SD.	73.59 ± 7.20	54.94 ± 13.90	73.86 ± 15.18		
Median (IQR)	71.43 (67.95 – 80.19)	60.0 (44.44 – 65.83)	75.0 (68.33 – 80.0)		
Sig. bet. grps.	p_1=0.001*,p_2=0.998,p_3=0.001*				

Conclusion

Topical metformin and adapalene, when used in combination, provided superior efficacy in managing mild to moderate acne vulgaris compared to each treatment alone.

Topical metformin could offer an enhanced treatment option for patients with insulin resistance or obesity with a focus on both efficacy and tolerability.