

# A COMPARATIVE STUDY BETWEEN SOME THERAPEUTIC APPROACHES FOR THE TREATMENT OF POST ACNE ERYTHEMA

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## INTRODUCTION

Post acne erythema (PAE) is a common sequale in many acne patients. This is due to wound healing-related dilatory changes in microvascular structures such as the microcapillary plexus in the very superficial dermis which are not detectable by the naked eye as visible telangiectasia but as general redness. Lesions appear as telangiectatic and erythematous macules which result from skin inflammation. Oxymetazoline is a synthetic, direct acting, imidazoline type, sympathomimetic agonist with potent vasoconstricting action that is highly selective for alpha 1 adrenoreceptors and partially selective for alpha 2adrenoreceptors. Tranexamic acid (TXA) is an antifibrinolytic agent that decrease erythema by repressing proinflammatory cytokines (IL-6 and TNFα) and angiogenesis. Skin micro-needling is a technique that involves repeated puncturing of the skin using sterilized microneedles to create micro channels with minimal damage to the epidermis leading to the production of growth factors, which help to facilitate skin healing and repair. These micro channels also facilitate the absorption of topically applied drugs.

## AIM OF THE WORK

The aim of this study was to assess the efficacy and side effects of topical oxymetazoline and topical tranexamic acid alone and combined with microneedling and microneedling alone in the treatment of persistent post acne erythema using clinical assessment and image analysis.

## SUBJECTS AND METHODS

**Patients:** This study included forty patients with persistent post acne erythema (more than 3 months) recruited from Dermatology Outpatient Clinic of the Alexandria Main University Hospital. Patients were divided into four groups; each one included ten patients planned as split face and treated for 3 months.

**Methods:** **Group I:** topical oxymetazoline 2% cream was applied 3 times daily on the right side of the face versus topical cold cream (placebo) applied on the left side of the face.

**Group II:** microneedling combined with topical oxymetazoline 2% cream was done every two weeks on the right side of the face versus microneedling combined with cold cream (placebo) on the left side of the face.

**Group III:** topical tranexamic acid 5% cream was applied 3 times daily versus topical cold cream (placebo) applied on the left side of the face.

**Group IV:** microneedling combined with topical tranexamic acid 5% cream was done every 2 weeks on the right side of the face versus microneedling combined with cold cream (placebo) on the left side of the face.

## RESULTS

Table: Comparison between the four studied groups according to PAE lesion count

	PAE lesion count	Baseline	After 3 months	Z	p
Right	<b>Group I (n = 10)</b>				
	Min. – Max.	14.0 – 30.0	5.0 – 22.0	2.003*	0.045*
	Mean ± SD.	20.90 ± 4.56	11.20 ± 6.48		
	Median (IQR)	20.0(18.0 – 24.0)	9.0(6.0 – 15.0)		
	<b>Group II (n = 10)</b>				
	Min. – Max.	12.0 – 26.0	0.0 – 9.0	2.812*	0.005*
	Mean ± SD.	16.0 ± 4.42	3.10 ± 2.85		
	Median (IQR)	14.50(13.0 – 18.0)	3.0(0.0 – 5.0)		
	<b>Group III (n = 10)</b>				
	Min. – Max.	6.0 – 30.0	0.0 – 15.0	2.200*	0.028*
	Mean ± SD.	14.10 ± 7.96	4.20 ± 4.66		
	Median (IQR)	11.50(8.0 – 18.0)	3.0(0.0 – 6.0)		
	<b>Group IV (n = 10)</b>				
	Min. – Max.	8.0 – 30.0	0.0 – 8.0	2.805*	0.005*
	Mean ± SD.	18.60 ± 6.98	2.30 ± 2.54		
	Median (IQR)	17.0(15.0 – 24.0)	2.50(0.0 – 3.0)		
Left	<b>Group I (n = 10)</b>				
	Min. – Max.	15.0 – 28.0	12.0 – 26.0	1.156	0.248
	Mean ± SD.	20.10 ± 4.33	18.90 ± 4.61		
	Median (IQR)	20.50(16.0 – 23.0)	20.0(15.0 – 22.0)		
	<b>Group II (n = 10)</b>				
	Min. – Max.	10.0 – 30.0	5.0 – 23.0	2.214*	0.027*
	Mean ± SD.	16.0 ± 5.85	12.30 ± 5.58		
	Median (IQR)	14.50(12.0 – 18.0)	11.0(9.0 – 14.0)		
	<b>Group III (n = 10)</b>				
	Min. – Max.	4.0 – 34.0	4.0 – 24.0	1.342	0.180
	Mean ± SD.	12.50 ± 8.87	11.10 ± 5.92		
	Median (IQR)	9.50(7.0 – 15.0)	9.50(7.0 – 15.0)		
	<b>Group IV (n = 10)</b>				
	Min. – Max.	9.0 – 28.0	0.0 – 22.0	2.403*	0.016*
	Mean ± SD.	16.80 ± 7.38	12.20 ± 7.57		
	Median (IQR)	14.50(10.0 – 25.0)	12.0(6.0 – 20.0)		

**Z: Wilxcon Signed Rank test**  
p: p value for comparing between baseline and after 3 months  
**Group I** = Topical OXZ  
**Group II** = OXZ + MN  
**Group III** = Topical TXA  
**Group IV** = TXA + MN  
**PAE:** Post Acne Erythema  
**TXA:** Tranexamic acid  
**MN:** Microneedling  
\*: Statistically significant at p ≤ 0.05  
**OXZ:** Oxymetazoline

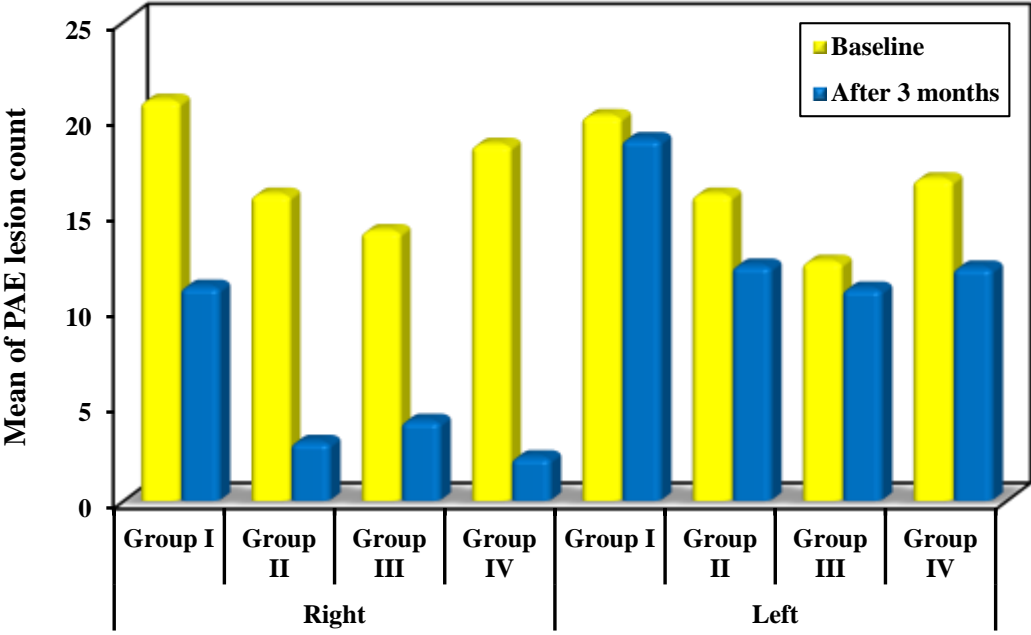


Figure: Comparison between the four studied groups according to PAE lesion count

## CONCLUSION

Topical oxymetazoline 2% and tranexamic acid 5% are safe and effective in the treatment of persistent post acne erythema. Microneedling combined with topical oxymetazoline 2% or tranexamic acid 5% is highly effective in the treatment of persistent post acne erythema as it facilitates the absorption of topically applied drugs.