

## COMPARATIVE EVALUATION OF RETINOIC ACID, BENZOYL PEROXIDE AND ERYTHROMYCIN LOTION IN ACNE VULGARIS

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Ninety three patients suffering from acne vulgaris were treated with 0.05% retinoic acid (23 patients), 10% benzoyl peroxide (24 patients), 2% erythromycin lotion (25 patients) and 50% glycerine in methylated spirit (21 patients) used as a control, for a period of 6 weeks. The patients were evaluated at 2 weeks, 4 weeks and 6 weeks by spot counting of the lesions and diagrammatic representations. Good to excellent results were obtained in 69.6% of patients on erythromycin lotion. Retinoic acid was more effective in reducing noninflammatory lesions (75.2%) whereas inflammatory lesions showed better response (73.6%) with erythromycin lotion and benzoyl peroxide was almost equally effective in both types of lesions.

**Key Words :** Acne vulgaris, Retinoic Acid, Benzoyl peroxide, Erythromycin

### Introduction

Acne is one of the most common noninfectious dermatoses which affects 30 to 66% of the adolescents.<sup>1</sup> Various aetiological factors incriminated are increased sebum production, an abnormality of the microbial flora, hyperkeratinization of the pilosebaceous duct and the production of inflammation. A large variety of therapeutic agents have been proposed having their specific effect on one or more of the aetiological mechanisms.

Topical Retinoic acid reduces comedogenesis by its effect on epidermal cell proliferation and differentiation.<sup>2</sup> Though, it is reported to be more effective in the non-inflammatory acne lesions,<sup>3</sup> it also decreases the inflammatory acne lesions.<sup>4</sup> Topical erythromycin affects the metabolism of *Propionibacterium acnes*<sup>5</sup> thereby reducing the levels of free fatty acids and has better response on inflammatory

lesions than comedones.<sup>6</sup> Benzoyl peroxide is considered to have both antimicrobial and anti-comedogenic effects. The present study was undertaken to study the relative efficacy of 0.05% retinoic acid cream, 2% erythromycin lotion and 10% benzoyl peroxide in comparison with glycerine in methylated spirit used as control, in the management of acne vulgaris.

### Materials and Methods

100 patients of acne vulgaris were included in the study. Patients with pregnancy or endocrinal problems like hirsutism, menstrual dysfunction or adrenal dysfunction and those taking drugs or contraceptives were not included.

At the first visit, the severity of acne was judged by spot counting of the non-inflammatory (NI) and inflammatory (I) acne lesions. The patients were selected randomly and were allocated to one of the following four treatment schedules (Vaswani et al).<sup>7</sup>

(a) Retinoic acid 0.05% cream to be applied at night.

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(b) Benzoyl peroxide 10% cream to be applied once daily.

(c) Erythromycin lotion 2% to be applied twice daily.

(d) Glycerine in methylated spirit 50% to be applied once daily.

Each group constituted of 25 patients. Treatment was continued for 6 weeks. Patients were assessed at two weekly intervals i.e., at 2 weeks, 4 weeks and 6 weeks by spot counting done by the same observer. The criteria for effectiveness of therapy were reduction in the number of lesions as well as in the depth of the lesions.

Final assessment was graded as four categories, being excellent in the event of reduction in lesion count by more than 75%, good reduction if lesion count was between 50-75%, fair by reduction in lesion count between 25-50% and poor in case of reduction in lesions count of less than 25%. In addition, the mean value of the reductions in the NI and I lesion counts was calculated for all the patients in each of the therapeutic groups.

## Results

100 patients (male 37 and female

63) between the ages of 13-32 showing acne vulgaris with a duration varying from 1 month to 7 years, were taken up for study. Two patients developed irritant reaction to retinoic acid, 1 patient to benzoyl peroxide. Four patients who were put only on methylated spirit (used as control) dropped out. Thus 93 out of 100 patients completed the stipulated 6 weeks follow up.

Out of total 93 patients, 12 patients were having the involvement of upper trunk in addition to the facial involvement. Excellent to good response was seen in 16 out of 23 patients (69.6%) treated with retinoic acid, 15 out of 25 patients (62.5%) treated with erythromycin lotion and none of the patients treated with glycerine in methylated spirit used as a control (Table I).

Retinoic acid showed reduction of 75.2% noninflammatory lesion and 60.7% of inflammatory lesions where as erythromycin lotion showed a reduction of 34.8% in non-inflammatory lesions and 73.6% of inflammatory lesions. There was not much difference in the reduction of non-inflammatory lesions (70.1%) and inflammatory lesions (63.9%) with benzoyl peroxide. (Table II)

**Table I.** Showing response of patients having acne vulagris to antiacne agents for a period of 6 weeks.

Treatment schedule	No. of patients	Number (percentage) of patients showing response			
		Excellent	Good	Fair	Poor
Retinoic acid 0.05%	23	10	6	5	2
Benzoyl peroxide 10%	24	8	7	5	4
Erythromycin lotion 2%	25	8	7	7	3
Glycerine in methylated spirit 50%	21	-	-	3	18

**Table II.** Mean reduction of non-inflammatory and inflammatory lesion counts at 6 weeks

Treatment schedule	Non-inflammatory lesions			Inflammatory lesions		
	Initial	Final	Reduction (%)	Initial	Final	Reduction (%)
Retinoic acid 0.05%	31.5	7.8	23.7 (75.2%)	21.6	8.5	13.1 (60.7%)
Benzoyl peroxide 10%	17.7	5.3	12.4 (70.1%)	16.3	5.7	10.6 (63.9%)
Erythromycin lotion 2%	20.1	13.1	7.0 (34.8%)	12.1	3.2	8.9 (73.6%)
Glycerine in methylated spirit 50%	21.5	19.9	1.6 (7.4%)	4.7	4.2	0.5 (11.9%)

**Comments:**

Over a period of two decades efficacy of topical retinoic acid in acne has been well established particularly in non-inflammatory lesions. Pedace and Stoughton<sup>8</sup> and Vaswani et al<sup>7</sup> have reported reduction of non-inflammatory lesions by 85% and 92.5% respectively over a period of 12 weeks therapy with topical retinoic acid.

In the present study, a reduction of non-inflammatory lesions was detected to occur in 75.2% patients over a period of 6 weeks. In addition, inflammatory lesions were observed to show a reduction in inflammatory lesions as reported by Vaswani et al.<sup>7</sup>

Benzoyl peroxide has also been reported to be effective in both non-inflammatory and inflammatory acne lesions by Kar et al<sup>9</sup> as observed in our study showing excellent to good response in 62.5% cases.

Topical erythromycin tends to affect both the metabolism as well as viability of *P. acnes* resulting in better response of inflammatory lesions than non-inflammatory lesions. In our study there was 73.6% reduction in inflammatory lesions. Similar results (80.3%) have been found by Vaswani et al and Kar et al.

Liani & Pasricha in 1992<sup>10</sup> found percentage reduction of lesions to the tune of 66.4%. There was a suggestion that response with topical erythromycin was earlier as compared to retinoic acid as also observed in our study.<sup>7</sup> It is concluded that out of topical antiacne agents, retinoic acid was found to be the most effective followed by benzoyl peroxide and erythromycin.

**References**

1. Cunliffe WJ, Cotterill JA. Clinical features of acne. In: The Acne. London: WB Saunders, 1975; 10.
2. Plewing G, Braun Falco O. Kinetics of epidermis and adenexa following vitamin A acid in the human. Acta Dermato - Venereol (Stockh) 1975; 55: 87-91.
3. Simpson JR, Trusted HW, Watts AM, et al. Clinical experience with 0.025% retinoic acid sol. in topical treatment of acne. Cur Med Res Opin 1973; 10: 485-7.
4. Mills OH, Kligman AM. Severe inflammatory acne: treatment with topical retinoic acid. Cutis 1974; 14: 142-6.
5. Fulton JE, Pablo G. Topical antibacterial therapy in acne. Study of the family of erythromycin. Arch Dermatol 1974; 110: 83-6.
6. Leyden JJ, Mc Ginley K, Mills OH, et al. Topical antibiotics and topical antimicrobial agents in acne therapy. Acta Dermato-Venereol (Suppl) 1980; 89: 75-9.
7. Vaswani N, Pandhi RK, Bhutani LK, Ramachandran K. Topical therapy of Acne Vulgaris with retinoic acid and

erythromycin lotion. *Ind J Dermatol Venereol Leprol* 1989; 55 : 230-3.

8. Pedace FJ, Stoughton R. Topical retinoic acid in acne Vulgaris. *Br. J Dermatol* 1971; 84 : 165-9.
9. Kar PK, Rama Sastry CV, Arora PN. A study of topical erythromycin versus benzoyl peroxide in Acne Vulgaris, in abstracts of

*Ind J Dermatol Venereol Leprol* 1993; 59

20th National Conference IADVL, Patana, Jan.1992.

10. Liani L, Pashricha JS. Evaluation of topical erythromycin and topical lactate with or without systemic ketoconazole in acne vulgaris. *Ind J Dermatol Venereol Leprol* 1992; 58: 323-7.

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