New Complex (α Hydroxy Acids, β Hydroxy Acids, Niacinamide and Glycerin) for Local Treatment of Acne Vulgaris

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Acne vulgaris is a chronic inflammatory dermatosis of the pilosebaceous unit affecting approximately 85% of adolescents, often persisting into adulthood. The local treatment is the first choice in many forms of acne. In the present study is about the use of a new complex (α hydroxy acids, β hydroxy acids, niacinamide and glycerin) in treating different stages of acne. The study was conducted in Iasi, on 82 patients and the treatment outcomes were evaluated using the DLQI score (Dermatology Life Quality Index).

Keywords: skin, acne, local treatment, α hydroxy acids, β hydroxy acids

Acne vulgaris is the leading reason for seeking the advice of a dermatologist worldwide. Although the disease does not affect the general health status, it has a significant impact on the quality of life of these patients [1]. It has been found that the impact is similar to such diseases as diabetes, asthma or epilepsy [2].

There are 4 important factors incriminated in the etiopathogenesis of this disease[3]:

1. inflammation
2. follicular hyperkeratosis
3. excess sebum production
4. bacterial colonization [4]

The most common occurrence of acne lesions in adolescents than in other age groups is explained by the direct action of androgenic hormones that stimulate the sebaceous glands in both sexes [5]. Other factors believed to play a role in the occurrence of acne lesions are: genetic predisposition, diet, hyperinsulinemia, anabolic steroids, vitamin A or E deficiency, hormonal imbalances (puberty, polycystic ovary syndrome) [6,7].

Treatment for acne varies depending on severity of clinical form: most frequently, topical therapy is used in mild acne, and systemic therapy combined with topical therapy in moderate and severe acne forms. When choosing the treatment modality patient's option must be taken into account, and most often, patients are reluctant to systemic therapies, Patients' preference regarding choice of treatment modality should be taken into account as most often patients may be reluctant to take systemic therapy due to concern over side-effects.

Of the substances that have been found to be a mainstay in the topical treatment of moderate and severe acne we mention α hydroxy acids (AHA) and β hydroxy acids (BHA). Of these two categories, glycolic acid and salicylic acid are most frequently used due to their multiple beneficial effects and fewer side effects [8].

Antibiotics were the first therapy that has proven effective for the treatment of acne, but their use either as prescription or over-the counter (OTC) medications led to the emergence of antibiotic resistance. More recent data support a reduction in the use of antibiotics for the treatment of acne and *The Global Alliance to Improve Outcomes* suggests that when antibiotics are necessary the duration and frequency of treatment should be decreased [9].

Niacinamide, a compound of vitamin B complex, is a relatively recently approved topical treatment option. Its use in the treatment of acne is especially due to its anti-inflammatory action, stimulation of keratinocyte differentiation and decrease of sebum secretion [10,11].

Experimental part

Material and method

In our study we used the DLQI (Dermatology Life Quality Index), a questionnaire introduced in 1994 by Finlay and Khan, an efficient instrument for assessing the health-related quality of life in dermatology patients. It consists of 10 questions that estimate the influence of disease with regard to symptoms, daily activities, leisure, work, school, personal relationships, and treatment.

Each response is scored and the summed scores give the DLQI score which ranges from 0 to 30. A 0-1 score means that the disease has no effect on patient's quality of life and a 21-30 score indicates that the disease has a major impact on patient's quality of life. This assessment instrument has been used in the following skin conditions: psoriasis, atopic eczema, urticaria, and also in lupus erythematosus, basal cell carcinoma, melasma, rosacea or seborrheic dermatitis [12, 13].

The study was conducted in a medical office, Lauderma Clinique, in Iasi, between 1.01.2014-1.01.2016 and included a number of 82 patients diagnosed with different clinical forms of acne. Acne was graded using the above described 4 grades of acne.

The treatment consisted in the topical application of α hydroxy acids, β hydroxy acids, niacinamide and glycerin, and treatment effectiveness was assessed by using DLQI questionnaire. For the ease of final calculations we used 5 score classes obtained as follows: score 1- no effect on patient's quality of life, score 2 - little effect, score 3 - moderate effect, score 4 – very large effect, score 5 - extremely large effect on patient's quality of life.

Database was processed with SPSS 18.0 statistical functions. Statistical analysis was performed as case-control tests, without adjustment for multiple testing, with nominal significance defined as $p<0.05$. Continuous variables were described using ANOVA test. Intergrupal

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Sex	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean - 95%CI	+95%CI	Min	Max	p
Male	10	21.00	4.67	1.48	17.66	24.34	14	31	0.49
Female	72	20.00	4.28	0.50	19.00	21.00	14	35	5
All groups	82	20.12	4.31	0.48	19.18	21.07	14	35	

Table 1
DESCRIPTIVE DATA FOR AGE (YEARS)

quantitative differences were established with t-Student test. The qualitative variables were compared using the Chi-squared test.

Results and discussion

In terms of demographic characteristics the study group was homogeneous by sex, age groups and area of residence: gender distribution showed that 87.8% of the subjects were female, sex ratio (F/M) = 7.2/ 1. Age ranged from 14 to 35 years, with no significant difference in mean age between sexes (21 *vs* 20 y; p = 0.495) (tabel 1).

Percentage distribution by age groups showed no significant differences (p = 0.358), although 60% of men were aged over 20 years while 55.6% of women were under 20 years. Distribution by area of residence showed that most subject came from urban areas, urban/rural (U/R) ratio= 3.6/1.

As to the grades of acne - the distribution was normal, a peak frequency of 74.4% being recorded for grade 2. There were no statistically significant percentage differences (p = 0.408) in the grade of acne between sexes, 70% of men and 75% of women having grade 2 acne (fig. 1).

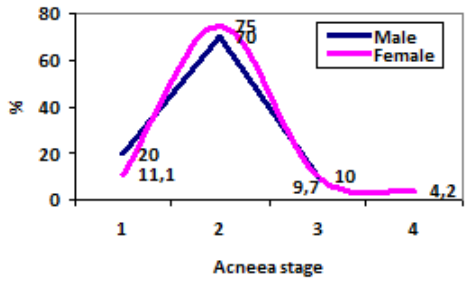

Fig. 1. Acne stages

Pre-treatment DLQI score did not show a Gaussian distribution, 58.5% of patients having a baseline DLQI score = 5 (equivalent to 21-30 points), that is an extremely large effect on quality of life (fig. 2).

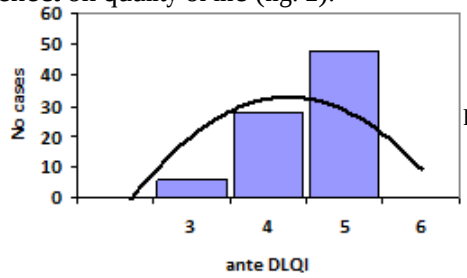

Fig. 2. DLQI score before treatment

DLQI score related to demographic characteristics showed the following:

- significant gender differences, 90% of men and only 54.2% of women had a baseline DLQI score = 5 (p = 0.031)
- 61.4% of the patients under 20 years and 55.3% of those aged over 20 years had a baseline DLQI score = 5 (p = 0.857)
- a slightly higher percentage of urban patients had a DLQI score=5 before treatment (64.1%), while most rural patients had a baseline DLQI score = 4 (p = 0.177)

Post-treatment DLQI score showed a Gaussian distribution, a DLQI score=2 being recorded in 51.9% of patients and a DLQI score = 3 in 42%, thus confirming an improved quality of life after topical therapy (fig. 3).

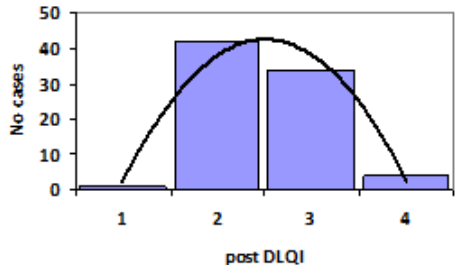

Fig. 3. DLQI score after treatment

Fig. 4. Pre- and post-treatment comparisons

Post-treatment DLQI score related to demographic characteristics showed the following:

- significant gender differences: 88.9% of men and only 36.1% of women had a post-treatment DLQI score = 3; 56.9% of women had a DLQI score = 2 and no man a DLQI score = 4 (p = 0.019)
- 47.7% of the patients under 20 years and 56.8% of those aged over 20 years had a post-treatment DLQI score = 2 (p = 0.542)
- a slightly higher percentage of urban (47.6%) and rural patients (66.7%) had a post-treatment DLQI score= 2 (p = 0.180).

Conclusions

The results obtained in this study indicate that á hydroxy acids and β hydroxy acids in combination with moisturizers is a valid option for the topical treatment of acne given the increased tolerability and fewer side effects.

If correctly administered, acne lesions diminish, treatment adherence increases as p*atients* feel *more* comfortable *using topical therapie,* and patient's quality of life is improved.

However, to maintain these gains treatment should be continued, and these substances repeatedly applied as indicated.

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