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# CRYSTALLOSCOPIC MONITORING OF THE EFFECTIVENESS OF SYSTEMIC RETINOIDS IN PATIENTS WITH SEVERE ACNE

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**ABSTRACT** — The aim of the work was to study the effect of isotretinoin preparations with different bioavailability (acnecutane and roaccutane) on blood and saliva crystallization in patients with severe forms of acne. The studies were conducted in two main groups: 25 patients used the drug Acnecutan in the treatment, 10 patients used the usual isotretinoin (Roaccutane). A study of the nature of own and initiated crystallization of blood serum and saliva was carried out by our techniques. The results of the study allow us to conclude that the tescrystalloscopic "pattern" of the biological environment of patients with acne differs significantly from that characteristic of practically healthy people. Based on biocrystalloscopic testing, it was found that in the course of treatment with isotretinoin drugs, a partial normalization of indicators was observed, which occurs mainly when using Acnecutan.

**KEYWORDS** — biocrystallogics, blood serum, acne, acnecutane, roaccutane

## INTRODUCTION

Currently, the issue of selecting the optimal drug for treatment of severe forms of acne is relevant [1, 3-7]. The drugs of choice are often antibiotics: tetracycline, doxycycline [7]. The dominant role is assigned to isotretinoin preparations, used in a dosage of 0.4-0.8 mg / kg (Acnecutan) and 0.5-1 mg / kg (Roaccutane, Erase) during a 4-months course. In the most severe forms of the disease, systemic steroids (prednisone 1 mg/kg/day for 2-4 weeks) can be used simultaneously [3]. Data on the use of Dapsone at a dose of 50-150 mg/day have been published [5]. Successful treatment of Perifolliculitis capitis abscedens et suffodiens accompanied by acne conglobata with a combination of dapsone and isotretinoin has been reported [3]. Interleukin- $\beta$ -blockers are used in the treatment of the PASH triad [4]; Etanercept, a combination of

isotretinoin and adalimumab — in the treatment of SAPHO syndrome [5]. The literature also provides information on the effectiveness of other methods of treatment: carbon dioxide laser in combination with local use of tretinoin with fractional grinding [3, 5]; cryotherapy; intra-focal administration of triamcinolone.

The crystallogenic properties, are inherent in any biosubstrate and being an integral parameter of its homeostasis [2, 8, 9], can indirectly reflect the state of the proteome of the biological medium, since the crystallogenic potential of the latter, realized due to its mineral components, directly depends on the conformational features and the degree of hydration of proteins [8, 9]. We have previously shown that the nature of dehydration structuring of blood serum in dermatological pathology (in particular, During's herpetiform dermatitis) differs significantly from that characteristic of healthy people [1]. This makes it possible, according to the theory of biocrystallogics analysis [8, 9], to evaluate the effectiveness of treatment by the crystallogenic properties of biofluids, primarily blood serum [9], as well as to compare various drugs by the effect on this indicator of homeostasis of the biological medium.

### *The aim of the work*

was to study the effect of isotretinoin preparations with different bioavailability (acnecutane and roaccutane) on blood and saliva crystallization in patients with severe forms of acne.

## MATERIAL AND METHODS

35 patients with severe forms of acne were under observation, including 22 men and 13 women aged 15 to 35 years (average age 21.33 years), duration of the disease: up to 3 years — 9 people (25.7%), 4-7 years in 19 people (54.3%), 8-11 years — 7 people (20%). The comparison group consisted of 23 people.

The studies were conducted in two main groups: 25 patients used the drug Acnecutan in the treatment, 10 patients used the usual isotretinoin (Roaccutane). The daily dose of Acnecutan averaged 0.45 mg/kg of weight ( $31.4 \pm 8.6$  mg), the course dose was 104.3 mg/kg of weight ( $7.1 \pm 1.4$  g) with an average patient weight of  $63.8 \pm 10.62$  kg. According to Roaccutane, the daily dosage was taken at the rate of 0.6

mg/kg of weight ( $43 \pm 10.37$  mg), 126.4 mg/kg per course ( $8.85 \pm 1.19$  g) with an average patient weight of  $68.9 \pm 10.1$  kg.

A study of the nature of own and initiated crystallization of blood serum and saliva was carried out by our techniques [2, 8, 9]. The basic substance for tesigraphy was 0.9% sodium chloride solution. The crystallograms and tesigrams were evaluated using a system of parameters [8, 9]. The study of these indicators was carried out before the start of treatment (1<sup>st</sup> examination), a month later (2<sup>nd</sup> examination) and 3 months after the start of therapy (3<sup>rd</sup> examination).

The data obtained were processed using the Statistica 6.0 program.

## RESULTS

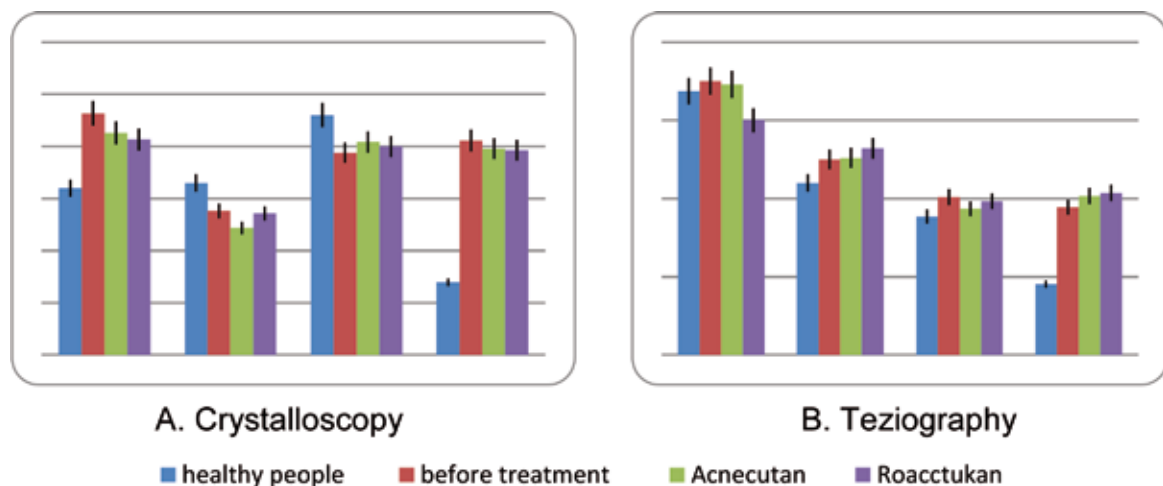
It was found that the tesicrystalloscopic "pattern" of the biological environment of acne patients differed significantly from the physiological one [2, 8]. Analysis of the facies of blood serum and saliva of acne patients before treatment revealed the features of the structuring of these biofluids (Fig. 1 and 2). Thus, the facies of the latter are characterized by high crystallogenic activity with a predominance of single crystal structures in the samples. It should be emphasized that the structural elements in microsamples of patients with acne are characterized by the presence of pronounced signs of destruction. The marginal zone of blood serum and saliva facies is quite clear, can be traced along the entire perimeter of the sample.

By the time of the 2<sup>nd</sup> examination (end of 1 month of treatment), the normalization of the crystallogenic properties of biofluids was variable. At the same time, changes in the crystallization of biofluids were characterized by a decrease in the density and complexity of the crystal structure, as well as the severity of destruction (Fig. 1a and 2a). Interestingly, the rates of normalization of the initiated crystallogenic biosubstrates at this observation point were lower (Figs. 1b and 2b).

By the 3<sup>rd</sup> examination, various degrees of normalization of the crystallogenic and initiating properties of saliva and blood serum were observed (Fig. 1 and 2). Thus, the maximum approximation of the tesicrystalloscopic "pattern" to the norm was recorded in the blood serum samples of patients treated with Acnecutan (Fig. 1a). At the same time, patients treated with Roaccutane had significant deviations from the norm (a decrease in the density of crystals and the complexity of their construction). In addition, a decrease in the marginal zone size with an increase in destruction degree was noted in microsamples. At the end of the therapy, similar processes of normalization of structure were observed in the facies of blood serum and saliva of patients with acne in both groups receiving Acnecutan and Roaccutane.

## CONCLUSION

The results of the study allow us to conclude that the tesicrystalloscopic "pattern" of the biological



**Fig. 1.** Dynamics of crystallogenic and initiating properties of blood serum in patients with acne depending on treatment option (Cr — crystallizability, K — crystallinity, TI — tesigraphic index, SI — structure index, Mz — marginal zone, FDD — facies destruction degree)

environment of patients with acne differs significantly from that characteristic of healthy people. Based on biocrystalloscopic testing, it was found that in the course of treatment with isotretinoin drugs, a partial normalization of indicators was found, which occurs mainly when using Acnecutan.

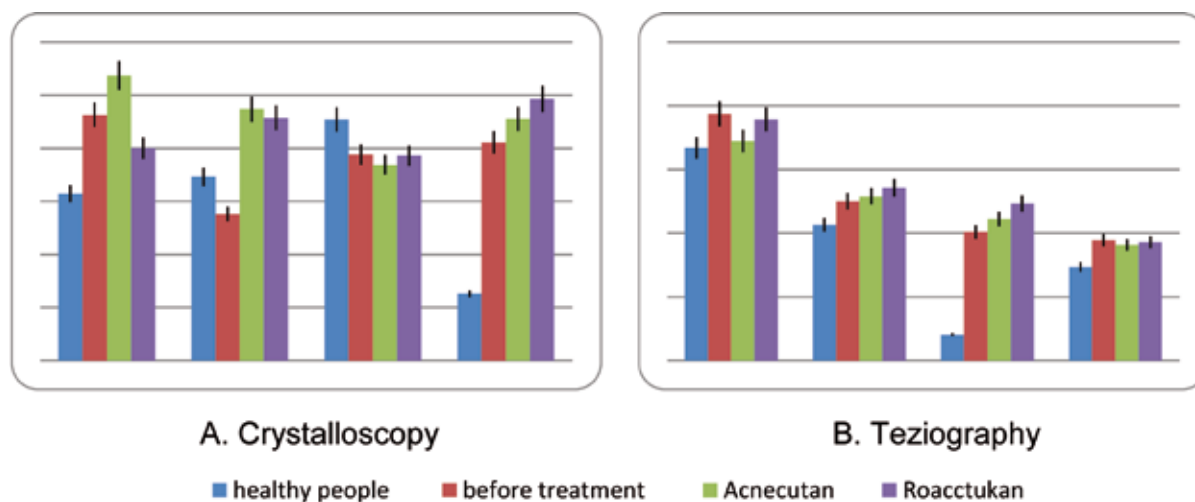


Fig. 2. Dynamics of crystallogenic and initiating properties of saliva in patients with acne depending on the treatment option (Cr — crystallizability, K — crystallinity, TI — tesigraphic index, SI — structure index, Mz — marginal zone, FDD — facies destruction degree)

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