

## ADEQUATE TREATMENT OF ACNE IN ADOLESCENTS

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<https://doi.org/10.5281/zenodo.11097966>

**Abstract.** *The article presents current literature data on the mechanism of acne development. The results of our own observations of 48 patients who received adequate local therapy with the drug "Clintopic" gel and combined treatment with oral doxycycline monohydrate are shown and analyzed.*

**Keywords:** *acne, adolescents, adequate combination therapy, "Clintopic" gel.*

It is important to suggest that due to the ongoing hormonal changes in children during puberty, various dermatoses can be observed on the surface of the skin, and one of the most common is acne, which can be detected in 90% of adolescents.

At present time the most correct name for this disease should be considered the term “acne disease” (AD), since here there is a set of symptoms with a common pathogenesis, manifested by noticeable morphological changes in visible areas of the skin of patients and often accompanied by psycho-emotional disorders, up to social maladjustment of adolescents.

The complex of factors leading to acne causes a chronic polyetiological recurrent disease of the hair follicles and sebaceous glands [1]. The full functioning of the skin is associated with a complex of androgen-sensitive structures (hair follicles, sebaceous and sweat glands). Therefore, acne most often manifests itself from the early stages of puberty with the onset of increased activity of the gonads. Hyperandrogenism stimulates the activity of the sebaceous glands; with normal production, sebum serves to lubricate the hair and the surface of the epidermis, is a thermal insulating agent, and has a bactericidal and fungicidal effect. But its excess production with an impaired qualitative composition (increased cholesterol, squalene, decreased linoleic acid) leads to the development of seborrhea with lipid imbalance, which plays an additional role in the pathogenesis of acne. These changes lead to pathological keratinization of the follicular canal; there is a slowdown in the rejection of keratinocytes at the mouth of the pilosebaceous follicle, which is due to a decrease in the disintegration of desmosomes, as well as changes in the qualitative and quantitative composition of sebum. Disruption of the processes of keratinization at the mouth of hair follicles and the formation of microcomedones that clog the excretory duct of the sebaceous gland create optimal anaerobic conditions for the active reproduction of resident lipophilic microflora, among which the main role is played by *Propionibacterium acnes* [2]. Propionic bacteria increase the lipolytic activity of microflora, stimulating the migration of neutrophils into the pathological focus, release inflammatory mediators, and also break down triglycerides into free fatty acids, inducing a local inflammatory reaction, which leads to the formation of inflammatory elements of acne (papules, pustules, nodes) of varying severity.

Acne lesions are characterized by false polymorphism with manifestations at different stages of evolutionary development. At the beginning, open and closed comedones appear, often without signs of inflammation. The formation of comedones is associated with the accumulation of horny masses at the mouths of the hair follicle, consisting of the secretion of the sebaceous glands and epidermal cells. Complete closure of the mouth of the follicle forms a closed comedon

(whitehead). Whiteheads clinically appear as small hemispherical dense nodules of a whitish-flesh color and do not resolve on their own. If the mouth of the hair follicle is open, then the horny plug moves freely in the duct of the pilosebaceous follicle with the formation of an open comedon (blackhead). Oxidation of sebum lipids, mainly squalene, gives the black color of the horny plug. Open comedones resolve spontaneously and without a trace in 80% of cases. At the beginning of inflammation of the sebaceous follicle, papules appear as a result of activation of anaerobic flora, causing damage to the wall of the sebaceous gland and migration of neutrophils and lymphocytes. With a further increase in the contamination of the pilosebaceous follicle with resident lipophilic microflora and *Propionibacterium acnes*, the inflammatory reaction intensifies and pustules appear. Nodules arise as a result of rupture of the wall of the hair follicle, release of the contents of the gland into the surrounding tissues and the development of an inflammatory reaction in the dermis. When pus forms in the nodes, cysts form. The resolution of comedones, superficial papules and pustules passes without a trace [1, 3, 4]. But with the formation of deeper cysts, nodes and pustules, irreversible post-inflammatory changes in the skin occur, characteristic of severe acne, which leave behind hypertrophic, keloid, atrophic scars and persistent pigmentation disorders. The formation of such cosmetic defects not only requires long-term treatment, but also bothers patients no less than the acne itself. This often has a strong impact on the psycho-emotional state of patients, reduces self-esteem, causes depressive disorders, which leads to problems of social adaptation, especially in adolescence.

These days doctors have a large number of medications in their arsenal, but treating patients with acne is a difficult task and requires an individual, complex selection of medications, and the use of standardized various therapeutic methods and cosmetics more often leads only to clinical remission, less often to cure [5, 6]

#### **Material and methods**

It was observed that 47 patients (27 girls and 20 boys) aged 12 to 18 years with a diagnosis of acne.

For the convenience of assessing the state of the pathological process, we used the classification of the American Academy of Dermatology, which is objective and convenient in practical terms, according to which there are 4 degrees of acne severity:

1st degree - comedones (open and closed) and up to 10 papules;

2nd degree - comedones, papules and up to 5 pustules;

3rd degree - comedones, papulopustular rash, up to 5 nodes;

Grade 4 - a pronounced inflammatory reaction in the deep layers of the dermis with the formation of multiple painful nodes and cysts.

Of the observed patients, 1-3 degrees of acne severity were identified in 36, which corresponded to a mild and moderately severe form of the disease, the remaining 11 patients had the most severe - grade 4 acne.

All patients underwent biochemical blood tests, hormonal status was examined (free fraction of testosterone, FSH, LH, PG, DHEA, 17-CS), microbial flora of the skin was isolated and identified with determination of sensitivity to antibiotics, immunogram, bacteriological studies of intestinal flora, general analysis blood. If necessary, consultations with other specialists were carried out: a gynecologist, an endocrinologist, a gastroenterologist and their joint treatment.

Each patient required an individual approach. At the very beginning of treatment, "patient education" was carried out; the teenager received information about the peculiarities of the course

of his disease, which specifically pointed out the possible long-term course of the disease, requiring proper skin care and systematic application of external medications, which could guarantee a gradual cure for this disease. Also traditional was the question of diet; we observed an indisputable clinical connection between the course of the disease and nutrition. Patients were recommended a low-calorie diet, which helped reduce androgen secretion and secondary sebum excretion.

Patients received treatment according to a developed algorithm depending on the severity of the disease, which included systemic and local drugs. An integrated and differentiated approach to patients with various forms of ulcer was important; they required long-term pathogenetic therapy against the background of properly selected local treatment.

Patients with severe - 4th degree acne, received combined local treatment in combination with systemic rational antibacterial therapy. For systemic antibacterial therapy, doxycycline monohydrate (Unidox Solutab) 0.1 g, 1 tbl was used. x 2 times lasting from 10 to 21 days, taking into account the age of the patients and the severity of the pathological process. The choice of doxycycline monohydrate was due to the fact that its antibacterial spectrum includes a large number of gram-positive and gram-negative bacteria, incl. P.acne. Resistance to it is rarely observed. The bioavailability of the drug is 95%. For better tolerability and reduction of unwanted side dyspeptic disorders, the drug was prescribed after meals.

Paying special attention to the physiological characteristics of the skin of adolescents, patients with mild and moderate forms of ulcer were treated only with local treatment in order to minimize the side effects of systemic antibiotics on the body of adolescents. From a practical point of view, the correct selection of a drug for local monotherapy, combining a combined therapeutic effect on the affected skin, was of great importance, which would allow achieving a good clinical effect and improving the quality of life of patients. Taking into account the above and based on the clinical experience we received earlier, for local treatment we used the “Clintopic” gel for patients with mild and moderate forms of acne as monotherapy, and for patients with severe - 4th degree of acne together with doxycycline monohydrate (Unidox solutab).

The main goal of our work was to provide an objective assessment of the effectiveness and tolerability of therapy with the Klintopic gel in adolescents, both in monotherapy and in combined treatment of acne with doxycycline monohydrate for varying degrees of severity of UB.

The choice of Clintopic gel was due to the fact that it is a combination drug intended for local treatment of acne of varying severity and contains the following substances: clindamycin 10 mg and benzoyl peroxide 50 mg.

Clindamycin is one of the most effective topical antibiotics used, which belongs to the group of lincosamide antibiotics. It binds to the 50S ribosomal membrane subunit and inhibits protein synthesis in the microbial cell, has a bacteriostatic effect against gram-positive aerobic microorganisms and a wide range of anaerobic bacteria, reduces inflammation and reduces the population of P. acnes, thereby reducing the content of free fatty acids.

Benzoyl peroxide is a drug that has a wide spectrum of antibacterial and anti-yeast activity without the development of microbial resistance. It has comedolytic and anti-inflammatory effects, improves tissue oxygenation, and suppresses the production of sebum in the sebaceous glands.

Benzoyl peroxide also prevents the development of P. acnes resistance, potentiates the effect of clindamycin, and consolidates the effectiveness of treatment. The combination of clindamycin + benzoyl peroxide has superior effectiveness to any component separately.

“Clintopic” gel was applied to the affected skin areas in a thin layer once a day, in the evening, after thoroughly cleansing the skin with warm running water and completely drying the skin.

“Clintopic” gel was used for patients with mild and moderately severe forms of acne as monotherapy, and for patients with severe – stage 4 acne in combination with doxycycline monohydrate (Unidox Solutab).

The effectiveness of therapy was assessed from the start of treatment at weeks 4, 6 and 12, taking into account the following parameters:

- dynamics of patient complaints and symptoms of the disease, as well as information about drug tolerance;

- conducting a verified assessment of effectiveness by the patient himself based on the severity of symptoms and subjective symptoms on a 10-point scale, where 10 points corresponded to the maximum severity of symptoms;

### Results

During the entire observation period, only 8 patients experienced adverse events in the form of redness, dry skin and itching at the beginning of treatment, but these side effects were temporary and disappeared within the first week of using the Clintopic gel. All patients noted the ease of use and reduction of discomfort, as well as the high anti-inflammatory activity of the Clintopic gel.

The overall assessment of the effectiveness by the doctor and the patient when carrying out only local monotherapy with Clintopic gel and combination therapy with doxycycline monohydrate is reflected in table. 1-2.

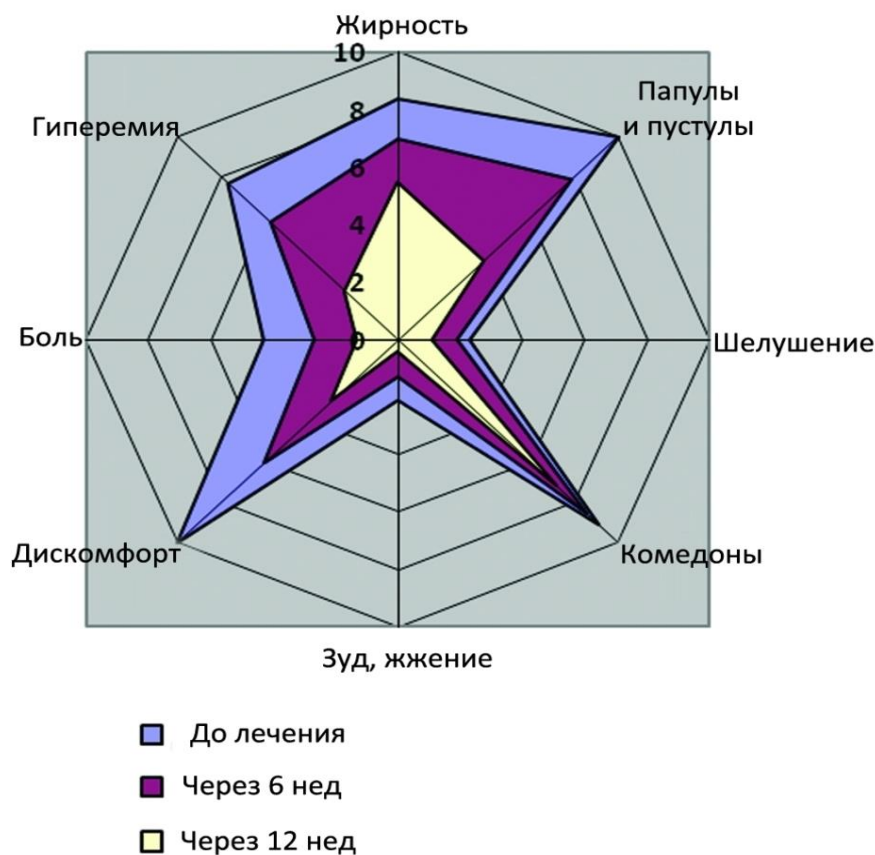
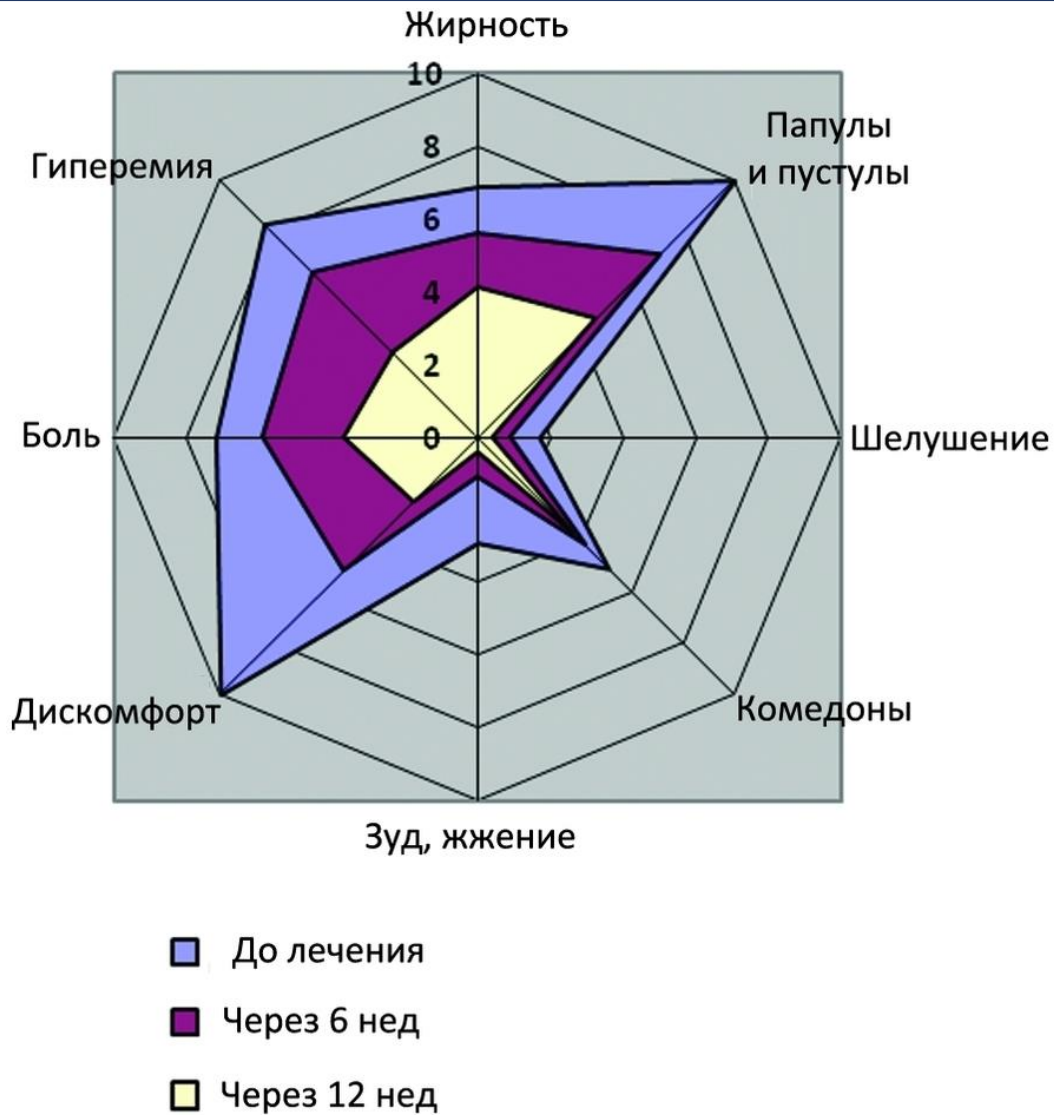


Figure 1. Individual assessment of various factors during therapy in patients with mild and moderately severe forms of acne who used Clintopic gel as monotherapy



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