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# Modern Therapy In The Treatment Of Patients With Erythematotelangiectatic Rosacea.

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**ABSTRACT**

The article gives a definition and characteristics of clinical presentation of rosacea and its modern classification. It describes symptoms that differentiate rosacea from other dermatoses and shows the inconsistency of modern scientific opinions and approaches in literature to rosacea etiology, pathogenesis, and treatment. The article points to the social significance of rosacea and stresses that it is important and possible to eliminate the disease symptoms at the early stages as well as to achieve and prolong its remission. We provide our country-first positive study experience of combined therapy based on the broadband pulse light and topical 0.5% brimonidine tartrate gel (MirvasoDerm®). The effectiveness of the therapy was evaluated using multispectral skin imaging that enables to define morphological patterns of the pathological skin areas in a real-time mode as well as to create the map of hemoglobin distribution and to measure its concentration in the rosacea foci. A high efficacy and very good tolerability of the above mentioned treatment have been demonstrated. The treatment also showed the absence of any adverse and undesirable effects in patients with erythematotelangiectaticrosacea.

**Keywords**: rosacea; topical therapy; broadband pulse light; brimonidine.

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## INTRODUCTION

Rosacea (acne rosacea, teleangiectasiasisfaciei) is a relatively common chronic facial skin disorder characterized by the presence of erythema, telangiectasia, papulopustular eruptions, lesions on the eyes and eyelids, and associated with angioneurosis in the areas innervated by the trigeminal nerve as well.Rosacea is a common skin disease, people of middle and old age suffer more often [2].The prevalence of rosacea in the world ranges from 1% to 20%[3,4]. Rosacea is localized mainly in the facial skin and is associated with the occurrence of transient or persistent erythema, telangiectasia, papulopustular elements and nodes[1]. In 2002, the members of National Rosacea Society (USA) have published a classification system which helps standardize the diagnosis of rosacea,recognizing the following four main subtypes depending on the primary and secondary characteristics: erythematotelangiectatic rosacea, papulopustular rosacea,phymatous rosacea, and ocular rosacea[5].

The etiology of rosacea is not fully known, but in the literature there are suggestions of causality of this disease. First of all, the development of diseases is associated with changes in the immune system. Due to an impaired permeability barrier in the stratum corneum, the release of various cytokines such as tumour necrosis factor a (TNF-a), IL-1 and IL-6 is triggered, leading to cutaneous inflammation, perhaps in an attempt of the epidermis to initiate self-repair [6].Elevated epidermal serine protease activity occurs in rosacea and causes the deposition of cathelicid in derived peptides in the skin [7]. These peptides have the ability to cause inflammation when injected in the skin [8]. Flushing and erythema are vascular components and represent increased numbers of erythrocytes in mildly inflamed vasculature. Chronic extra vascular fluid accumulation in the superficial dermis causes damage to the lymphatic vessels and subsequent inflammatory edema [9]. In addition, neutrophil elastase released at the site of inflammation degrades the extracellular matrix and Type IV collagen in the capillary walls reducing the integrity of blood vessels. Reduction in the integrity of the upper dermal connective tissue allows passive dilation of vasculature causing the telangiectatic component [11].

The main features of the erythematotelangiectaticrosacea are redness (short-term erythema), persistent centrofacial erythema (background erythema), and progressive development of telangiectasia of the facial skin.Treatment of rosacea patients is a complicated task; the treatment modes depend on multiple etiological and pathogenetic factors, on stages and clinical forms of the dermatosis. Clinical efficacy of broadband pulse light in rosacea treatment is achieved in the long-term treatment course only. It provides positive outcomes but the minimal course should include 5-8 sessions. In modern conditions, it is necessary to develop effective methods of combined therapyto achieve the clinical effect in a shorter time. We have developed a comprehensive patho genetic treatment method that combines broadband pulse light with topical application of 0.5% brimonidine tartrate gel in patients with erythematotelangiectaticrosacea.The method is expected to shorten the phototherapy treatment course and to providea significant clinical effect.

## EXPERIMENTAL

The objective of our study was to develop a comprehensive patho genetic treatment method for erythematotelangiectaticrosacea that combines broadband pulse light and topical 0.5% brimonidine tartrate gel (MirvasoDerm®) and to evaluate the efficacy of the therapy using multispectral skin imaging that enables to define morphological patterns of the pathological skin areas as well as to create a map of hemoglobin distribution and to measure hemoglobin concentration in the rosacea foci.

## MATERIALS AND METHODS

We monitored a group of 45 female patients aged from 30 to 55 years diagnosed with erythematotelangiectaticrosacea. The history of the disease variedon an average between 1 year to 9 years.

To control the morphological changes and the functional status of skin microcirculation, we applied multispectral skin imaging using Antera 3D scanning device before and after treatment inall patients in the group. The device allowed real-time evaluating morphological patterns of the pathological skin areas affected by rosacea at the epidermal and dermal levels, to create a map of hemoglobin distribution and measure its concentration in the rosacea foci (Fig.1). Combined effect of 0.5% brimonidine tartrate gel (MirovasoDerm®) and phototherapy potentiated each other. Thus, 0.5% brimonidine gel neutralized the background erythema, making telangiectasis more susceptible to phototherapy, and the energy emitted by the broadband light

device was actively absorbed by hemoglobin in the telangiectatic blood vessels. As a result, their obliteration developed, and a significant clinical effect was achieved.

## RESULTS AND DISCUSSION

We evaluated the following parameters of hemoglobin concentration in the selected skin area with a pronounced clinical picture before and after treatment by multispectral skin imaging using Antera 3D scanning device:

1. The total hemoglobin (mean hemoglobin concentration in the selected area). It decreased from 1.902 units to 1.312 units.
2. Hemoglobin deviation (the degree of hemoglobin homogenous distribution in the selected area). It decreased from 0.41 units to 0.193 units on average. The closer this parameter is to zero, the more homogeneous is hemoglobin distribution, and the better is the skin color, which, in this case, is illustrative of the presence of positive changes in patients.
3. The percentage of relative hemoglobin distribution
   This parameter defines total hemoglobin and hemoglobin deviation ratio. It provides information on the distribution homogeneity and the hemoglobin content decrease. Thus, in patients after treatment this parameter decreased from 100% to 58.3%, which is illustrative of significant positive changes (Fig. 1).

In all 45 female patients who received the combined therapy, mean total hemoglobin level before treatment was 2.1±0.3, while after two sessions of combined therapy (3 months) it was 1.3±0.2; hemoglobin deviation before treatment was 0.5±0.2, while after treatment it was 0.2±0.09; relative hemoglobin distribution after treatment was 55%±5%. Thus, the decrease of hemoglobin in the tissues as a result of treatment was45%±5% (where p = 1). Follow-up of the patients during three months showed no recurrences.

The treatment was well tolerated by all patients with no reported cases of adverse effects.

Thus, the method of combined patho genetic therapy proposed by us forery the mato telangiec taticrosacea, including application of 0.5% brimonidine tartrate gel (as a product that influences the intensity of erythema),on the one hand, and broadband pulse light therapy exposure (influencing the persistent telangiectatic dilation of the vessels), on the other hand, is not only efficient, but allows shortening the time to reach the expected visible clinical effect. We recommend carrying out a number of combined therapy sessions to achieve a pronounced clinical effect in the treatment of erythematotelangiectaticrosacea.

Combined therapy for erythematotelangiectatic rosacea was effective in 100% of patients. It showed 40 to 50% decrease in the clinical parameters, excellent tolerability and the absence of significant adverse effects and undesirable events (Fig.2).

Studies perform ed*in vivo* using multispectral skin imaging allowed detecting patterns of pathological processes in rosacea and controlling their changes in the course of treatment. Shortening of treatment duration was due to combined application of brimonidine and broadband pulse light for erythematotelangiectaticrosacea. Brimonidine removed background erythema leaving the telangiectatic foci intact; at the same time, the energy emitted by the broadband light device was actively absorbed by hemoglobin in the telangiectatic vessels causing their obliteration. Therefore, the combination of brimonidine for erythema and broadband pulselight for telangiectasia is an efficient and fast treatment option for symptoms of erythematotelangiectaticrosacea.

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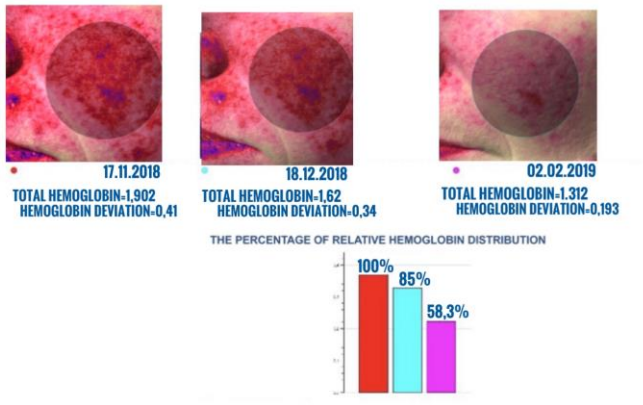


**Fig 1: Patient S. Treatment results showing changes in hemoglobin absorption within the telangiectatic blood vessels and their occlusion detected by multispectral skin imaging using the Antera 3D scanning device.**

red color – prior to the treatment;
blue color – 1 month after the 1st session of the combination therapy;
violet color – 1 month after the 2nd session of the combination therapy.

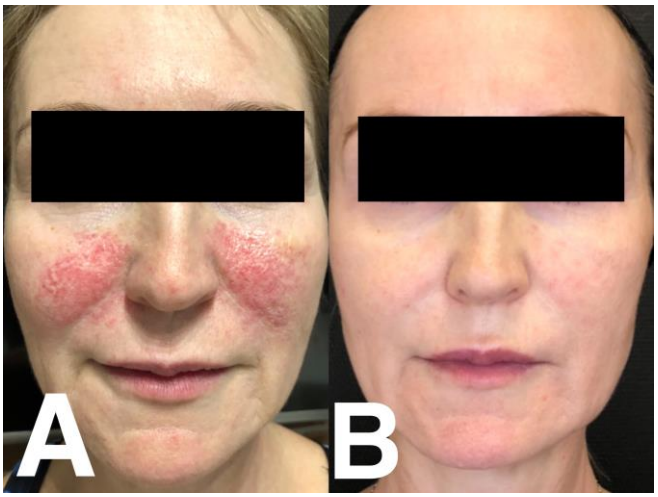


**Fig 2: Patient S. with erythematotelangiectatic rosacea.**

Results of the combination therapy based on MirvasoDerm® gel and phototherapy.

A – prior to the treatment; B – 1 month after 2 sessions of the combination therapy.

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