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#### SUMMARY

The article is devoted to a review of the clinical results of the use of color light therapy in the treatment of acne vulgaris (acne) by incoherent optical radiation of blue and red light from LED sources. Recently, color light therapy has become widespread among non-pharmacological methods of treating such a common multifactorial chronic polymorphic dermatosis as acne. Among the advantages of color therapy in the treatment of this pathology, it should be noted its good effectiveness, the absence or insignificant severity of side effects and the possibility of using it in patients with contraindications to antibiotic therapy.

Key words: color light therapy, color therapy, skin diseases, acne, acne, acne, acne vulgaris, incoherent visible light, LEDs.

### RESUME

The article reviews clinical results of color light therapy in the treatment of acne vulgaris with noncoherent optical radiation of blue and red light from light emitting diodes. Recently, color light therapy has become widespread among non-pharmacological methods of treating such a common multifactorial chronic polymorphic dermatosis as acne. Among the advantages of color therapy in the treatment of this pathology, it should be noted its good effectiveness, the absence or mild and transient side effects and the possibility of its using in patients with contraindications to antibiotic therapy.

Keywords: color light therapy, skin diseases, acne vulgaris, acne, noncoherent radiation in visible range, light emitting diodes.

#### INTRODUCTION

Acne (acne vulgaris) is one of the most widespread dermatological diseases, the incidence of which at the age of 10 to 12 years is 82.4% with a significant decrease by the age of 25; in the age groups of 25–34 and 35–44 years, this pathology is observed in 8% and 3% of cases, respectively [1, 2]. The disease occurs with the same frequency in males and females and in most cases is characterized by a long persistent course (from 5 to 10 years). Acne is a polymorphic multifactorial dermatosis, in the development of which there are such pathogenetic factors and processes as dysfunction of the endocrine system, hypersecretion of sebum, impaired keratinization processes, the state of microflora, the activity of bacterial lipases, the level of free fatty acids,

Due to the chronic, recurrent nature of the course of the disease, which, as a rule, affects open areas of the skin, this dermatosis has a significant impact on the quality of life of patients, including its physical, emotional and social components. According to some reports, acne is a significant stress factor, especially in adolescence and adolescence, leading in some cases to the development of anxiety, depression, interpersonal problems, reducing self-esteem and limiting the patient's active participation in all spheres of life.

The polyethiological nature of acne and the pronounced polymorphism of the manifestations of the disease require an integrated approach and the use of various options for pathogenetically based therapy, both systemic and local, many of which, unfortunately, have a number of side effects [5]. All of the above is the reason for the ongoing search for new methods.

acne treatment, among which close attention deserves the use of light of different wavelengths in the optical range for therapeutic purposes - color light therapy [6, 7]. Color therapy is an easy-to-use, non-invasive, side-effect-free treatment option that can be used alone or in combination with conventional treatments. For decades, dermatologists have noted the beneficial effects of sunlight on acne, but it was not entirely clear which wavelength range (ultraviolet, visible or infrared) the reported beneficial effects depend on. Recent clinical experience has shown that laser and LED light sources can be a very effective treatment for patients with acne, which is especially important for those of them

# MATERIALS AND METHODS

Publication search algorithm and used electronic databases For this review, publications in the domestic and foreign press of the results of clinical studies devoted to the issue of color light therapy for acne were searched in the following electronic databases available through Internet resources: eLibrary.ru, PubMed.com, Scopus, Medline, EM-BASE, Cochrane Libraries. The search for publications for the review was carried out from 2000 to September 2020. by keywords: color light therapy, skin diseases, acne, acne, acne vulgaris, incoherent visible light, LEDs.

## Selection criteria for articles

Articles for subsequent analysis were selected according to the following criteria: original articles published in peer-reviewed scientific journals, randomized controlled trials that examined the results of using color light therapy versus control (placebo), studies using visible light of the same wavelength (color) or a combination, including in combination with other standard treatments. In the event that articles of the same authors identical in content were found, the summary results were taken into account during the processing of the resulting data array.

Results of generalized analysis of publications

Recently, LED sources of incoherent optical radiation have been actively used to treat acne, producing blue (wavelength from 405 to 420 nm) and red (wavelength from 620 to 660 nm), which are considered the most therapeutically effective. The mechanisms for the implementation of the therapeutic effect of blue and red are not fully understood, however, it is believed that blue is highly effective in inhibitingPropionibacterium acnes through interaction with porphyrinsbacterial cells, and red color increases cellular activity and has a pronounced anti-inflammatory effect [7, 9, 10]. The results of clinical evaluation of the effectiveness of color light therapy in the treatment of acne are summarized in table. 1. Comparative results of the use of color light therapy and some common methods of treating acne are shown in table. 2.

# Effectiveness of using color light therapy in acne treatment

A study in Japan examined the efficacy of color light therapy in the treatment of 30 patients (27 women and 3 men) with mild to moderate acne [11]. Areas with rashes (face, back or chest) were irradiated twice a week for 5 weeks using a blue light source with an intensity of 90 mW / cm<sub>2</sub> in the wavelength range 407–420 nm [1]. Clinical assessment of the skin condition <del>was</del> carried out before the start of the course of therapy and after one, three, five weeks of treatment, as well as one month after the end of the course of light therapy. The study showed a 64% reduction in acne lesions on the skin of patients and a good tolerance to light therapy, which allowed the authors to suggest a new possibility of treating acne with blue color therapy.

Table 1

Clinical Results of Color Light Therapy in Acne Treatment

No.	Disease	author (authors)	Impact parameters	results	Source Nick
1.	Acne	Kawada A., Aragane Y., Kameyama H., Sangen Y., Tezuka T.	Blue color 407-420 nm, 90 mW / cm2, 2 times a week, 5 weeks.	Reducing acne in patients by 64% after a course of treatment.	[eleven]
2.	Acne	Tzung TY, Wu KH, Huang ML	Blue color 420 ± 20 nm, dose 40 J / cm2, 2 times a week, 4 weeks.	Exposure to blue had a statistically significant effect.	[12]
3.	Acne	Morton CA, Scholefield RD, Whitehurs C., Birch J.	Blue color 409-419 nm, 40 mW / cm2, dose 40 J / cm2, t eight 10- or 20-minute treatments over 4 weeks.	Onset of treatment effect at 5 weeks, maximum effect between 8 and 12 weeks after treatment.	[13]
4.	Eel bo- mischief	Olisova O.Yu., Ivanova E.V., Makhmudov A.V.	Blue color 405-420 nm.	Complete regression of rashes as a result of blue color therapy in> 71% (25 of 35 sick).	[fourteen]
5.	Acne	Vladimirov V.V., Olisova O.Yu., Pinson I.Ya., Sirmais N.S.	Blue color 405-450 nm, procedure 15-20 minutes, 1-2 times a week, 15-20 procedures for 8 weeks.	As a result of blue color therapy, complete regression of rashes was achieved in 68.4% (in 13 of 19 patients).	[15]
6.	Acne vulgar	Papageorgiou P., Katsambas A., Chu A.	Blue color 415 ± 20 nm 4.23 mW / cm2; red color 660 ± 10 nm 2.67 mW / cm2; at a distance of 25 cm, <sup>15 minutes.</sup>	Reduction of inflammatory processes by 76% after the combined use of blue and red compared to using only blue, white and cream with benzoyl peroxide.	[16]
7.	Acne vulgar	Goldberg DJ, Russell BA	Blue color 415 nm 40 mW / cm2, dose 48 J / cm2 and red color 633 nm 80 mW / cm2, dose 96 J / cm2, twice a week 20 min. interval in 3 days, alternating exposure.	Decrease in quantity lesions by 46%, after 4 weeks and 81% after 12 weeks.	[17]
eight.	Acne vulgar	Lee SY, You CE, Park MY	Blue color $415 \pm 5$ nm 40 mW / cm2, dose 48 J / cm2 and red $633 \pm 6$ nm 80 mW / cm2, dose 96 J / cm2, 20 minutes twice a week with an interval of 3-4 days between each procedure, 4 weeks.	Overall significant improvement in non-inflammatory and inflammatory skin lesions accounted for 34.2 8% and 77.93%.	[eighteen]
nine.	Acne vulgar	Sadick ns	Blue color 415 nm 40 mW / cm2, dose 48 J / cm2 20 min, red 633 nm 70 mW / cm2, dose 126 J / cm2 30 minutes, every week, for 4 weeks (a total of 8 procedures).	The decrease in the number of lesions 8 weeks after the end of the course of treatment was 69%.	[19]
ten.	Acne vulgar	Liu G., Pan C., Li K., Tan Y., Wei X.	Blue color 405 ± 10 nm 30 mW / cm2, red 630 ± 10 nm 48 mW / cm2, twice a week at intervals of two days for four weeks.	The number of lesions after color therapy with blue decreased by 71.4%, after therapy with red - by 19.5%.	[twenty]
eleven.	Acne disease	Baybekov I.M., Khashimov F.F.	Laser radiation 630 nm, power 8 mW, blue color 470 nm, green color 525 nm, IR radiation 940 nm, power 5 mW, session for 5-7 minutes 10 days	The effectiveness of the use of blue LED and infrared radiation is practically not inferior to the effect of laser therapy.	[21]

A study conducted in Taiwan also examined the effect of blue color with a wavelength of 420  $\pm$  20 nm in 28 patients with symmetric facial acne (10 men and 18 women aged 15 to 32 years) [12]. One side of the face, selected at random, was exposed to blue light from a source located 15 cm from the skin surface (dose 40 J / cm<sub>2</sub>) twice a week for 4 weeks, the other, untreated side served as a control. The condition of the skin was assessed before the start, after two, four and eight treatment sessions, as well as 1 month after the completion of the color therapy course. The results showed that, compared to the non-irradiated side of the face, exposure to blue in the treatment of acne was statistically significantly effective (P <0.001), and only patients with cystic nodular acne showed some tendency to worsen despite treatment.

Morton CA et al. evaluated the effect of blue on inflammatory and non-inflammatory

skin lesions in 30 patients (53% of men and 47% of women aged 16 to 52 years) with acne on the face of mild to moderate severity [13]. Within 4 weeks, patients received eight 10- or 20-minute blue skin irradiation procedures from an LED source with a wavelength of 409-419 nm and an intensity of 40 mW / cm<sub>2</sub> at an optimal dose of 40 J / cm<sub>2</sub>... A separate quantitative assessment of inflammatory and non-inflammatory lesions, as well as an assessment of the tolerance of color therapy was carried out after five, eight and twelve weeks of treatment. The results showed a decrease in inflammatory lesions in patients at week 5, reaching statistical significance by week 8 and lasting up to 12 weeks. The effect on non-inflammatory skin changes was minimal. The study noted good patient tolerance of the treatment procedure, only mild self-resolving adverse effects in the form of erythema were recorded. The authors concluded that color therapy is a safe and effective adjunctive treatment for mild to moderate acne.

In the work of Olisova O.Yu. et al. a study of the efficacy and safety of the use of blue color therapy with a wavelength of 405 to 420 nm, including in combination with antibiotics, was carried out on 45 patients with acne (26 men and 19 women aged 17 to 30 years) [14]. The patients were divided into 3 groups: patients of the 1st group (10 people) received conventional treatment (antibiotics, vitamins, local therapy with ointments), 15 patients of the 2nd group - blue color therapy, and 20 patients of the 3rd group - an antibiotic (doxycycline , 200 mg per day) in combination with color therapy. As a result of the course of treatment, none of the patients in the 1st group experienced a complete regression of rashes, a significant improvement was noted in 4 patients, some improvement in 5 patients (50%) and a complete lack of effect in 1 patient. In group 2, complete regression of rashes after color therapy was achieved in 8 patients (50%), significant improvement in 4 patients (27%), some improvement in 2 patients and no effect in 1 patient. In group 3, which received an antibiotic in combination with color therapy, complete regression of rashes was observed in 17 patients (85%), a significant improvement in 3 patients (15%). Thus, out of 35 patients with acne who received blue color therapy, including in combination with an antibiotic, a complete regression of rashes was achieved in 25 (> 71%), which allowed the authors to talk about the high efficacy and safety of this method. treatment. some improvement in 2 patients and no effect in 1 patient. In group 3, which received an antibiotic in combination with color therapy, complete regression of rashes was observed in 17 patients (85%), a significant improvement in 3 patients (15%). Thus, out of 35 patients with acne who received blue color therapy, including in combination with an antibiotic, a complete regression of rashes was achieved in 25 (> 71%), which allowed the authors to talk about the high efficacy and safety of this method. treatment. some improvement in 2 patients and no effect in 1 patient. In group 3, which received an antibiotic in combination with color therapy, complete regression of rashes was observed in 17 patients (85%), a significant improvement in 3 patients (15%). Thus, out of 35 patients with acne who received blue color therapy, including in combination with an antibiotic, a complete regression of rashes was achieved in 25 (> 71%), which allowed the authors to talk about the high efficacy and safety of this method. treatment.

A group of domestic authors also studied the effectiveness of blue therapy (wavelength 405–450 nm) in combination with systemic antibiotics and local external agents on 37 patients (20 men and 17 women aged 17 to 31 years) with acne I- II degree of severity [15]. The patients were divided into two groups: the first group (18 people) received antibiotic treatment (doxycycline at a dose of 200 mg per day for 1 month) in combination with local cosmetics for washing and care, the second group (19 patients) received similar treatment antibiotic, but in combination with exposure to blue. The duration of the color therapy session was 15–20 minutes, the procedures were carried out 1–2 times a week, 10–15 procedures per course of treatment. The study lasted 8 weeks. In the first group, as a result of the course of treatment, complete regression of rashes did not occur in any patient, a significant improvement was noted in 33.3% of cases (6 patients), some improvement was noted in 55.6% of cases (10 patients), and there was no effect. noted in 11.1% of cases (2 patients). In the second group of patients who received blue therapy in combination with an antibiotic, complete regression of rashes was detected in 68.4% of cases (13 patients), and a significant improvement was achieved in 31.6% of cases (6 patients). The successful results of using blue color therapy as part of combination therapy (complete regression of rashes in 68.4% of patients) allowed the authors to recommend this method as monotherapy in patients with mild acne and as part of complex treatment regimens in patients with moderate and severe course.

A UK study evaluated the use of blue (415  $\pm$  20 nm) and a combination of blue (415  $\pm$  20 nm) and red (660  $\pm$  10 nm) in the treatment of mild to moderate acne vulgaris. [16]. The study involved 107 patients who were randomly assigned to four groups: blue (27 patients), a combination of blue and red (30 patients), white light (25 patients), and 5% benzoyl peroxide cream (25 patients). Irradiation of patients with appropriate light at a distance of 25 cm from blue sources (4.23 mW / cm<sub>2</sub>) and red (2.67 mW / cm<sub>2</sub>) colors were applied daily for 15 min. A comparative assessment of the skin condition of patients in the selected groups was carried out every 4 weeks for 12 weeks of treatment. Evaluation in the groups receiving color light therapy was carried out

blind method. As a result, a decrease in inflammatory processes was revealed on average by 76% (95% confidence interval 66–87) with the combined use of blue and red, which was significantly higher than when using blue (at 4 and 8 weeks), benzoyl peroxide (at 8 and 12 weeks) or white light (at all times). The authors concluded that color therapy using a combination of blue and red is an effective treatment for mild to moderate acne, probably due to the combination of antibacterial and anti-inflammatory effects, which also does not have significant side effects.

Another study on LED color light therapy for acne vulgaris, examining the efficacy of a combination of blue and red, was conducted on 22 patients (13 men and 9 women, aged 16 to 29 years) with mild to severe symmetric facial acne [17]. For treatment, two separate LED arrays were used, emitting blue color (wavelength - 415 nm, intensity - 40 mW / cm2) and red (wavelength - 633 nm, intensity - 80 mW / cm2). The course of treatment included eight sessions of color therapy, carried out twice a week with an interval of 3 days with alternating exposure to blue (total dose 48 J / cm2) for 20 minutes and in red (total dose 96 J / cm2) also for 20 minutes with preliminary light microdermabrasion. Skin lesions were quantified at the start of the study and two, four, eight and twelve weeks after the end of treatment. There was a statistically significant decrease in the average number of lesions, which was 46% after 4 weeks and 81% - after 12 weeks with minimal or transient side effects, the greatest effect was achieved with more severe acne and inflammatory skin lesions. The authors concluded that combined blue and red color therapy appears to have positive potential in treating acne of varying severity.

The next study practically repeated the methodology of the previous one and was also devoted to studying the effectiveness of the use of combined color therapy in blue (wavelength 415 ± 5 nm) and red (wavelength - 633 ± 6 nm) in the treatment of acne vulgaris [18]. The study involved 24 patients with mild to moderate acne on the face, procedures were performed twice a week for 4 weeks with an interval of 3-4 days between procedures, while each week in the first procedure, blue was used, and the second is a red light. For one 20-minute procedure, the total dose for blue (intensity 40 mW / cm2) and red (intensity - 80 mW / cm2) was 48 J / cm2 and 96 J / cm2, respectively. Clinical assessment of the skin condition in patients was carried out before treatment, after the 2nd, 4th and 6th procedures, as well as two, four and eight weeks after the end of the course of treatment. The final mean statistically significant improvement in non-inflammatory and inflammatory skin lesions was 34.28% and 77.93%, respectively, with no side effects after treatment. The authors conclude that the combination of blue and red LED color therapy is an effective, safe and painless method for treating acne vulgaris of mild to moderate severity, especially in papulopustular form.

A similar study to study the effectiveness of the use of a combination of blue and red in inflammatory lesions of the skin of the face was carried out in 21 patients (38% of men and 62% of women aged 14 to 21 years) with mild to moderate acne vulgaris [19]. The exposure was carried out using a flat array of LEDs with alternating exposure to blue (wavelength - 415 nm, intensity - 40 mW / cm<sub>2</sub>, dose - 48 J / cm<sub>2</sub>) for 20 minutes and in red (wavelength - 633 nm, intensity - 70 mW / cm<sub>2</sub>, dose - 126 J / cm<sub>2</sub>) within 30 minutes. The procedures were performed every week for 4 weeks (a total of 8 procedures per treatment course), the skin condition was assessed at baseline and two, four, eight and twelve weeks later. There was a gradual decrease in the number of lesions during 4 weeks of color therapy, which lasted up to 8 weeks, while the final statistically significant average decrease observed 8 weeks after the end of the course of treatment was 69%, which confirmed the effectiveness of the combined use of blue and red in the treatment of acne vulgaris.

A study in Shanghai compared the efficacy of blue and red in color therapy for acne vulgaris in twenty patients (6 men and 14 women aged 18 to 40) with mild to moderate acne [20]. In this case, compact, inexpensive and easy-to-use portable LED sources of blue and red colors were used. The patients were randomly divided into two groups, which received either blue therapy (wavelength -  $405 \pm 10$  nm, intensity - 30 mW / cm<sub>2</sub>), or red ( $630 \pm 10$  nm, intensity -

48 mW / cm2) twice a week at intervals of two days for four weeks with the source of the color at a distance of 2 cm from the face. The exposure to the corresponding color was performed in a repeating sequence: forehead, left cheek, chin, right cheek, T-zone (nose) for 10 s for each area and 20 min. in one session. Each session included 20 cycles of color exposure, while the doses for each session were 7.2 J / cm2 for blue and 11.52 J / cm2 for red. Quantification of the results after completion of treatment showed a statistically significant improvement in the blue treatment group, with a 71.4% reduction in skin lesions in patients after blue color therapy versus 19.5% in the red treatment group. There were no obvious side effects, with the exception of a few patients who reported mild dry skin. The authors noted that it is possible that the power of the exposure can be an important factor influencing the effect of red therapy.

An interesting and voluminous study was carried out with the aim of a comparative assessment of the therapeutic effect of laser and LED radiation on the skin condition, blood microcirculation and the shape of red blood cells in acne. The study involved 148 patients (98 men and 50 women aged 16 to 34 years) with acne from 1 to 3 years old [21]. The acne area was exposed to a laser radiation source (wavelength - 630 nm) with an output power of 8 mW and using LED matrices of blue (wavelength - 470 nm), green (wavelength - 525 nm) and infrared light (wavelength - 940 nm) with an output power of 5 mW. The values of the doses of laser and LED radiation were comparable and amounted to about 1.25 / / cm2... Irradiation was carried out daily for 10 days with the duration of each session 5–7 minutes against the background of conventional therapy (antibiotics, vitamins, enterosorbents). In order to assess the results of treatment, light and scanning electron microscopy of skin biopsy specimens, blood micromorphometry, laser Doppler flowmetry, as well as visual and palpation clinical examination of patients before and after treatment were performed. The results of the complex treatment of acne demonstrated the effectiveness of the inclusion of color therapy in the course of treatment of patients with acne and emphasized that the effectiveness of the effect, especially in blue with a wavelength of 470 nm and in the infrared (IR) range with a wavelength of 940 nm, is practically not inferior to the effect of laser therapy. ...

## Comparative results of using color light therapy and some common acne treatments

Over the past decades, the problem of the resistance of the skin microbiota to antibiotics, which are widely used in systemic and local treatment of acne, has developed and continues to grow, which is associated with the frequent and uncontrolled use of antibacterial agents in general and in acne in particular. So, starting in the late 1970s. number of antibiotic-resistant strainsPropionibacterium acnes steadily increased, and by the beginning 2000s their share in sown strains in different European countries ranged from 51% to 94% [8, 22, 23]. The decrease in the effectiveness of acne therapy associated with this urgent problem can be overcome through the development and introduction of new, pathogenetically substantiated agents and methods of treatment that can increase the effectiveness of antimicrobial effects, for example, the use of some external acne treatments that are not antibiotics, combined use with color light therapy and other non-pharmacological methods of treatment [24, 25]. The generalized results of similar studies comparing the effectiveness of acne treatment using color light therapy and some other common means are shown in table. 2.

Comparative clinical results of using color light therapy and some common acne treatments table 2

N	Disease	author (authors)	Impact parameters	results	Source Nick
1.	Acne vulgar	LH de Arruda et al.	Blue 407-420 nm 40 mW / cm2 , 8 sessions twice a week versus 5% benzoyl peroxide twice a day.	The blue color was as effective as benzoyl peroxide, but with fewer side effects.	[26]
2.	Acne	ANCheema et al.	Blue light 407-420 nm twice daily versus 4% benzoyl peroxide twice daily.	The effectiveness of treatment with blue was 76%, with benzoyl peroxide - 60%.	[27]
3.	Acne vulgar	A.Elgendy et al.	Blue 405-420 nm 90 mW / cm2, 12 sessions twice a day for 6 weeks versus isotretinoin 0.3 mg / kg / day for 6 weeks (6 months overall).	Decrease in the number of lesions: blue - 32% after 2 weeks and 76% after 6 weeks of treatment, isotretinoin - by 15.3% after 2 weeks and 50% after 6 weeks.	[28]

So in one of these studies, the efficacy and safety of treating patients with acne on the face of II and III severity with blue color (wavelength 407-420 nm) was assessed in comparison with 5% benzoyl peroxide (Benzoyli peroxydum) widely used in local acne therapy [ 26]. The study included 60 patients, 30 of whom received blue irradiation of the affected areas of the face with an intensity of 40 mW / cm<sub>2</sub> twice a week, 8 sessions per course of treatment, while the rest of the patients applied 5% benzoyl peroxide to similar areas of the face twice a day. The skin condition was assessed at baseline and on days 7, 14 and 28 of treatment, as well as 14 days after the end of the course of therapy. The results of the study demonstrated that in the treatment of grade II and III acne, blue color therapy was as effective as the use of benzoyl peroxide, regardless of the type of skin lesion, but gave significantly fewer side effects.

Comparison of the effectiveness of using blue color therapy with topical application of benzoyl peroxide was carried out in another study, which involved 124 patients (52 men and 72 women, average age of participants  $23.02 \pm 6.3$  years) with mild to moderate acne [27]. The patients were divided into two equal groups, one of which received blue color therapy (407–420 nm) twice a day, and the other received topical 4% benzoyl peroxide twice a day. The effectiveness of treatment was assessed at 2, 4, 6, 8 and 12 weeks by a decrease in the number of lesions in both groups of patients, while in the blue treatment group there was an average improvement of 76%, and in the topical benzoyl peroxide group - by 60%. ...

Another study compared the efficacy of blue (405-420 nm with an intensity of 90 mW / cm2) with the use of isotretinoin (Isotretinoin) in a small dose (0.3 mg / kg / day) in the treatment of patients with mild to moderate acne [28]. The study involved 60 patients, divided into two equal groups. Patients of the first group (12 men and 18 women aged 18 to 32 years) received blue color treatment (12 sessions twice a week for 6 weeks), patients of the second group (14 men and 16 women aged 16 to 28 years) ) were treated with isotretinoin for 6 months. Skin condition was assessed at baseline and every two weeks, and the results showed a decrease in the number of lesions in both groups of patients. The blue treatment group showed an improvement of about 32% after 2 weeks and 76% after 6 weeks of treatment. In the second group, the improvement was approximately 15.3% after 2 weeks and 50% after 6 weeks of taking 0.3 mg / kg / day of isotretinoin. The authors concluded

# CONCLUSION

Acne is a widespread skin disorder that causes significant medical, social and psychological problems. The prevalence of this dermatosis among working groups of the population, the severity of clinical manifestations, damage to visible

skin areas, the persistent nature of the pathology, the formation of psychoemotional disorders in patients that reduce the quality of life, actualize the problem of the effectiveness of the treatment of this disease and lead to a constant search for new means and methods of treatment. Over the past decades, in numerous studiesin vitro and in vivo, as well as in a number of clinical studiesit was noted that, under certain conditions, the effect of color light therapy in acne treatment may be comparable to that of antibiotics. This is largely due to the fact that topical and systemic antibacterial drugs have significant adverse side effects, and their frequent use has led to an increase in bacterial resistance, followed by a decrease in their effectiveness in acne therapy. An analysis of the studies presented in this review allows us to conclude that color light therapy is one of the promising modern methods of treating acne and can be implemented by using blue or using it in combination with red. In addition, this method can be recommended as monotherapy in patients with acne,

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[1] Hereinafter, the correspondence of the color to the wavelength is indicated according to the primary sources

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