



USE OF EXIMER LASER IN THE TREATMENT OF VITILIGO

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Abstract

The study of the pathogenetic mechanisms of the development of depigmentation and the search for adequate combined methods of treating patients with vitiligo is one of the most urgent areas of modern dermatology; the study was carried out on the basis of the regional dermatovenerological dispensary. The study was conducted between 2019 and 2020. We conducted a randomized comparative study of seventeen male patients with extensive depigmented spots on the face, which were snow-white when viewed with a Wooden Lamp, with a clinical diagnosis of vitiligo, and they were examined at the regional dermatological dispensary in the city of Samarkand. These patients suffered from chronic vitiligo that remained stable for 3-10 years.

Keywords: excimer laser, vitiligo, treatment

Introduction

Vitiligo is characterized by a sudden loss of pigment on any part of the skin. Focuses of depigmentation, prone to peripheral growth, arise as a result of a violation of the secretory function of melanocytes or their death. The development of the disease is not accompanied by subjective symptoms, does not pose a threat to life, but is an unfavorable factor that has a serious impact on the quality of life, psychoemotional state of the patient, his mood and leads to impaired social connections and maladjustment. According to the WHO, in the world there are up to 40 million people (about 2.8% of the world population) suffering from this disease. Vitiligo is found everywhere, regardless of race, gender or age, occurs at any age, but most often from 8 to 25 years old. It is still unclear as a result of which factors the synthesis of melanin is abruptly stopped and melanocytes die. Several exogenous factors can directly or indirectly affect melanocytes, infectious, chemical and toxic agents, excessive



ultraviolet radiation and stress. At the same time, chronic liver diseases of an infectious or toxic origin, helminthic invasion, a combination with autoimmune diseases (autoimmune thyroiditis, lupus erythematosus, rheumatoid arthritis, alopecia areata, atonic diseases) are likely to contribute to the appearance of vitiligo. Vitiligo is a multifactorial disease with a genetic predisposition. A significant number of genes involved in the pathogenesis of vitiligo have been identified, but it is not yet possible to name the key ones. Currently, several theories of the pathogenesis of vitiligo have been formulated, among which the most substantiated are the theory of immune disorders in the regulation of melanogenesis, the neurogenic theory, and the theory of oxidative stress.

Research in the field of immunology confirms the decisive role of cell-mediated reactions in the development of the autoimmune process, as well as in the violation of immune regulation of melanogenesis. At the same time, the results of numerous studies are often contradictory and contain statements regarding both pronounced changes of a subpopulation nature and violations of the activation and synthetic ability of cells of the immune system in vitiligo. Therefore, research in this area is still relevant. Vitiligo, according to a number of researchers, can occur after stress, in turn, the appearance of depigmented foci causes a stress-dependent state, which is expressed in the development of autonomic, neuroendocrine, immune, metabolic and trophic dysfunctions that form a picture of psychoemotional disorder. The formation of affective disorders is accompanied by neurophysiological, neurochemical disorders; a vicious circle is created that contributes to the maintenance of the pathological process and the appearance of new foci of depigmentation. The results of studying the causes and mechanisms of the development of vitiligo do not give an unambiguous answer, and therefore the treatment of this disease still remains one of the most difficult problems. Considering vitiligo as an autoimmune process, foreign researchers use immunosuppressive therapy, systemic corticosteroid drugs, cyclosporine, which inhibit the activation of cells of the immune system. On the one hand, these treatments can be effective early in the disease; on the other hand, they cause serious complications and side effects. Insufficient effectiveness, and with the long-term existence of vitiligo, lack of effect and high risks of complications and side effects limit the widespread use of these treatment methods. In modern medicine, in the complex treatment and prevention of vitiligo, medicinal immunocorrecting drugs are traditionally used. The chronic persistent nature of dermatoses with an immune component in the pathogenesis requires long-term use of drugs of this group. However, given the need for their long-term use, there is a high risk of developing a wide range of side effects and a syndrome of tolerance to the drug taken, as a result of which foreign researchers are currently studying the clinical efficacy of nonsteroidal inhibitors of pro-inflammatory cytokines pimecrolimus and tacrolimus, as a result of which the range of side effects decreases. with various forms of vitiligo. Also, many authors emphasize the high effectiveness of combining treatment with ultraviolet physiotherapy. Therefore, today ultraviolet physiotherapy of vitiligo is considered the safest and most popular method for treating various forms of vitiligo.

Experimental studies have shown the high efficiency of phototherapy using UV rays of the UV range (280-315 nm). It has been proven that rays with a wavelength of more than 315 nm (UVA) are ineffective in the treatment of vitiligo, and short-wave UVC radiation causes mutations and is carcinogenic. UVB



therapy is a relatively safe method of treatment due to the minimal exposure of the human body to radiation. The rays of this wavelength range are completely scattered in the epidermis, initiating photobiological processes. reactions that improve the condition of the skin. Along with the spectral composition of ultraviolet radiation, an important parameter in the process of phototherapy, which has a significant effect on the effectiveness of treatment, is the dose level of ultraviolet radiation when the patient's skin is irradiated. The optimal value from the point of view of the effectiveness and safety of phototherapy in the treatment of vitiligo is, as a rule, the value of the minimum dose of erythema (MED), which determines the level of sensitivity of the patient's skin to UV radiation. There is a well-known technique for determining a patient's condition. When using a UVB dose lower than MED, phototherapy may be ineffective, and irradiation of the skin with a dose higher than the MED will burn the patient's skin, which can provoke an exacerbation of the disease. Excimer lasers are often used as a source of UV radiation, capable of generating coherent and directional radiation at a wavelength of 308 nm. Laser radiation arising from the disintegration of an exciplex molecule has stable spectral-energy characteristics and is easily dosed; therefore, excimer lasers are traditionally used in dermatology.

Purpose: Thus, the study of the pathogenetic mechanisms of the development of depigmentation and the search for adequate combined methods of treating patients with vitiligo is one of the most urgent areas of modern dermatology.

Materials and methods

The study was carried out on the basis of the regional dermatovenerologic dispensary. The study was conducted between 2019 and 2020. We conducted a randomized comparative study of seventeen male patients with extensive depigmented facial patches that were snow-white on examination with a wooden lamp, with a clinical diagnosis of vitiligo, and they were examined in the regional dermatological dispensary of the city of Samarkand. These patients had chronic vitiligo that remained stable for 3-10 years. They have previously been treated with a variety of topical drugs, including topical steroids and calcipotriene, for at least two years (2 to 6 years) without significant repigmentation. An excimer laser combined with topical vitamin D twice a day was selected for treatment. Laser therapy was performed twice a week until patients developed significant repigmentation. Patients began using the excimer laser at a dose of 200 MJ / cm², which increased by 10 percent per visit until patients experienced phototoxic side effects, including severe erythema and blisters. The treatment dosages were then maintained or reduced by 10%, depending on the severity of the side effects. None of the patients discontinued treatment due to the side effects of laser therapy. The total number of procedures, the duration of treatment, and the average dose of laser energy were recorded. As in other studies, we chose the percentage of repigmentation with ranges: <25, 25-50, 50-75 and > 75 percent as the main criterion for assessing.

Results

All patients underwent the recommended course of treatment, which included laser therapy with topical application of vitamin D. Table 1 shows the effect of combination therapy on patients. Seven out



of sixteen patients achieved more than 75% repigmentation after 22 treatments or less. Nine patients achieved similar results after 40 treatments. No correlation was found between the average dose of laser energy exposure and the percentage of repigmentation.

Table No. 1.

Количество пациентов:	Возраст пациентов	Продолжительность выполняемых процедур	Количество выполненных процедур.	Доза лазерного излучения.	Репигментация %
4	18-25	11 недель	22	220	>75
3	26-31	10 недель	20	308	>75
2	32-36	16 недель	35	350	>75
7	37-41	20 недель	40	380	>75

Discussion

Vitiligo is a chronic, psychologically debilitating and difficult to treat disease. Many of the treatments currently in use require treatment intervals of more than one year to achieve apparent repigmentation. In this study, patients achieved more than 75% repigmentation of facial injuries between 10 and 20 weeks.

There are many theories that explain the effectiveness of light therapy in treating vitiligo. The findings show that inactive melanocytes present in the outer membranes of hair follicles persist in people with vitiligo. Then initiation of therapy can induce the maturation of these latent melanocytes, with an initial migration up the hair follicle with final expansion into the epidermis. In addition, those with reduced hairline potential have the most stable areas.

Seven patients in this series achieved excellent results (repigmentation > 75%) in a short time (5 months or less) compared to other treatments such as topical steroids, PUVA and NB-UVB. These patients achieved rapid results with such excellent results due to the increased sensitivity of the facial hair follicles to the excimer laser. Further research into the prognosis of response to excimer laser therapy may provide additional insight into the disease process.

Some studies show that people in different age groups from 18 to 31 years old may respond faster to therapy and have better results than age groups from 32 to 41 years old. Further research is needed with a large number of applications performed by skin type.

The excimer laser has proven to be a useful tool in the treatment of vitiligo. Patients receiving excimer laser treatment achieve excellent results in a few months, not many months or years. More data is needed to determine if skin type, gender, or other characteristics of hair follicles respond better to excimer therapy. More broadly, there are very few estimates of relapse rates in patients undergoing any mild treatment. This information will be critical to patient decision making and deserves attention.



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