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ASSESSMENT OF THE ROLE OF NITRIC OXIDE IN PATIENTS WITH VITILIGO

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Abstract: The results of the study showed that with vitiligo there is a violation
of the production of nitric oxide in the blood serum, and the most significant increase
in this indicator is determined in patients with a non-segmental form of the disease
and depends on the duration of the disease.

Keywords: nitric oxide, blood serum, pigment deficiency in melanocyte, non-
segmental, vitiligo.

Vitiligo is a skin disease of unknown etiology characterized by depigmentation
in some areas of the skin due to pigment deficiency in melanocyte cells [4, 8, 10].

Vitiligo occurs in 0.5-1% of the world's population [7]. According to the
results of large epidemiological studies, the prevalence of the disease in China and
India is 0.093% and 0.38%, respectively, in European countries it is lower, for
example, in Denmark - 0.005% [9].

The average age of onset of vitiligo is significantly lower in patients with
vitiligo in the family - the percentage of such patients, according to various sources,
ranges from 7.7% to 50% of the total number of patients with vitiligo [8]. This
dermatosis is characterized by a constant and chronic course, while not causing
drastic changes in various organs and systems.

Vitiligo significantly affects the psychological state and self-esteem of the
patient, especially when the skin of the face and hands is affected. According to the
results of studies, the level of impact on the mental state of patients with vitiligo is
comparable to eczema and psoriasis and is not hereditary [5, 9]. Patients with vitiligo
are prone to mental disorders such as maladjustment, sleep disturbances, depression,
anxiety, and dysthymia [3, 6].

According to domestic and foreign researchers, vitiligo develops through the
complex effects of endo- and exogenous factors in the body, in particular,
neuroendocrine and immune disorders, redox reactions, and changes in the intensity
of microcirculation [1, 8].

The causes of vitiligo are still unknown. According to some researchers, the
cause of this disease may be genetic factors and defects in the antioxidant system, and

exogenous factors are necessary for the manifestation of vitiligo [2]. Latent inflammatory reaction and autoimmune processes play a certain role in the stage of disease development [2, 4].

Oxidative stress plays an important role in the development of vitiligo. According to the literature, melanocytes of vitiligo patients have congenital defects that reduce their resistance to reactive oxygen species (ROS) and other damaging factors [7].

Currently, of particular interest is the study of the influence of an infectious agent on various biochemical processes in the body. In recent years, in medical practice, special attention has been paid to the study of the role of free radicals in the pathogenesis of many pathological reactions [6, 9].

One of the free radicals involved in redox processes in the body is nitric oxide (NO), which is considered a signaling molecule that provides intercellular communication and regulation of many functions in various tissues and body systems [3, 5, 10].

Therefore, it was of interest to study the regulatory effect of nitric oxide (NO) on metabolic processes in the clinical course of vitiligo.

The purpose of the study : the results of testing the state of nitric oxide in the blood serum of patients with vitiligo in comparison with those of healthy individuals.

Materials and methods of research : 73 patients aged 19 to 59 years who were on outpatient and inpatient treatment at the Republican Scientific and Practical Medical Center of the Ministry of Health of the Republic of Uzbekistan and the regional department of the Jizzakh region were examined (head of the department, MD, prof. Yuldashev M.A.). The duration of the disease ranged from 6 months. up to 22 years, the majority of patients (58.9%) noted the duration of the disease from 1 to 10 years. Among the examined patients, 22 patients had a segmental form of the disease and 51 patients had a non-segmental form of vitiligo. The control group consisted of 14 practically healthy individuals.

The amount of nitric oxide (NO) is determined by the sum of metabolites of nitrates and nitrites (NO₂ and NO₃) according to the method of Golikova P.P. and others [2000], in which to 0.1 ml of a suspension of microsomes and incubated for 10 min at room temperature. The optical density was measured on an SF-46 spectrophotometer (Russia) at a wavelength of 546 nm. Sodium nitrite (NaNO₂) was used as a standard. We calculated according to the following formula: $A = E \times k; V_{xm}$ (μmol/mg of protein), where: k is the calculated coefficient equal to 40x10³ μM/cm; E is the extinction index of the sample in the spectrophotometer; V is the number of microsomes, ml; m - microsomal acid, mg/ml.

The results obtained during the study were performed by the method of variation statistics using the Microsoft Office Excel-2010 package, which includes software support for statistical analysis.

Results of the study : the results of the test for nitric oxide showed (Table 1) that when comparing the general group of patients with vitiligo with the control group, there was a significant increase in the amount of nitric oxide in the blood serum, the average values of which were 15.62±0.51 μmol/l, while in the control group this indicator was 9.46±0.23 μmol/l (p<0.001), which indicated a significant

increase in nitric oxide in the blood serum of patients with vitiligo compared to the control group.

When studying the amount of NO in patients with vitiligo, depending on the clinical form of the disease, it was found that the amount of nitric oxide in the blood serum of patients with the segmental form of vitiligo averaged $11.15 \pm 0.36 \mu\text{mol/l}$, while in the non-segmental form, a significant increase in average values was recorded. – $17.57 \pm 0.52 \mu\text{mol/l}$ ($P < 0.001$) (Table 1).

Table 1

Indicators of nitric oxide in the blood serum of patients with vitiligo ($M \pm m$)

Study groups	Number of examined patients	NO in blood serum, $\mu\text{mol/l}$
Control group, n =14	14	9.46 ± 0.23
Main group, n =73	73	$15.62 \pm 0.51^{**}$
Segmental form of vitiligo, n =22	22	$11.15 \pm 0.36^*$
Non-segmental form of vitiligo, n =51	51	$17.57 \pm 0.52^{**}$

Note: p - reliability of indicators relative to the control group (* - $p < 0.01$; ** - $p < 0.001$)

The results obtained indicate that in vitiligo, a violation of the production of nitric oxide in the blood serum is detected, which negatively affects the course of this dermatosis.

In further studies, we studied the relationship between the level of nitric oxide in the blood serum of patients with vitiligo and the duration of the disease.

The results of the study showed (Table 2) that in patients with vitiligo, regardless of the duration of the presence of the pathological process, the amount of nitric oxide in the blood serum of all examined patients compared with the control group increased statistically, and the average duration of the disease in patients up to 1 year was $12.48 \pm 0.93 \mu\text{mol/l}$ ($p < 0.01$), in patients with disease duration from 1 to 5 years - $14.34 \pm 0.71 \mu\text{mol/l}$ ($p < 0.001$), in patients with disease duration from 5 to 10 years - $15.42 \pm 0.69 \mu\text{mol/l}$ ($p < 0.001$) and $20.61 \pm 1.06 \mu\text{mol/l}$ ($p < 0.001$) in patients with a disease duration of more than 10 years. years, in the control group this figure was $9.46 \pm 0.23 \text{ mmol/l}$.

table 2

Indicators of the amount of nitric oxide in the blood serum of patients with vitiligo, depending on the duration of the disease ($M \pm m$)

Study groups	Number of examined patients	NO in blood serum, $\mu\text{mol/l}$
Control group	14	9.46 ± 0.23
Disease duration up to 1 year	13	$12.48 \pm 0.93^*$
Disease duration from 1 to 5 years	22	$14.34 \pm 0.71^{**}$
The duration of the disease is from 5 to 10 years	23	$15.42 \pm 0.69^{**}$
Disease duration more than 10 years	15	$20.61 \pm 1.06^{**}$

Note: p - reliability of data relative to control groups (* - $p < 0.01$; ** - $p < 0.001$)

But the identified changes depended on the duration of the disease, with the greatest changes in the amount of nitric oxide found in patients with a disease duration of more than 10 years.

Conclusions:

1. With vitiligo, a violation of the production of nitric oxide in the blood serum is detected, which negatively affects the course of this dermatosis.
2. A significant increase ($P < 0.001$) in the amount of nitric oxide in the blood serum of patients with non-segmental form of vitiligo ($17.57 \pm 0.52 \mu\text{mol/l}$) in relation to patients with segmental form ($11.15 \pm 0.36 \mu\text{mol/l}$) was proved.
3. A correlation conditionality of the high content of nitric oxide in the blood, which depended on the duration of vitiligo, was established, its smallest increase was recorded with a disease duration of up to 1 year, and the largest in patients with a disease duration of more than 10 years.

References

1. Batpenova G.R., Aimoldina A.A., Kotlyarova T.V. et al. The significance of oxidative stress and immunological disorders in vitiligo // Immunopathology, allergology, infectology. -2014. -#4. -FROM. 10-14.
2. Vaisov A.Sh., Mirodilova F.B. The role of nitric oxide and reactive oxygen species in the pathogenesis and clinic of patients with trichophytosis combined with a subclinical form of hypothyroidism // News of dermatovenereology and reproductive health. 2007. -№4.S. 5-9.
3. Vanin A.F. Nitric oxide in biomedical research // Bulletin of the Russian Academy of Medical Sciences. 2006. No. 4. pp. 3-5.
4. Gereykhanova L.G., Lomonosov K.M., Bashlakova K.A. Oxidative stress in the pathogenesis of vitiligo and methods for its correction // Russian Journal of Skin and Venereal Diseases. - 2016. - T. 19, No. 1. - P. 45-48.
5. Ismailov R.G. The state of the component in the system of lipid peroxidation - the antioxidant system in patients with vitiligo // World of Medicine and Biology. - 2011. -#4. -p.89-91.
6. Lomonosov K.M. Oxidative stress and antioxidant therapy for various skin diseases // Russian Journal of Skin and Venereal Diseases. -2009. -#2. -p.27-30.
7. Lysenko V.I., Korsunskaya I.M. Antioxidants in the treatment of vitiligo // Vrach. -2012. -#9. -p.85-87.
8. Pinson I.Ya., Olisova O.Yu., Bashlakova K.A., Gereykhanova L.G. Question about the treatment of vitiligo // Russian journal of skin and venereal diseases. -2016. -T.19. -#2. -p.102.
9. Kadry M., Tawfik A., Abdallah N. et al. Platelet-rich plasma versus combined fractional carbon dioxide laser with platelet-rich plasma in the treatment of vitiligo: a comparative study // Clin Cosmet Investig Dermatol. - 2018. - Vol.1 1. - P.551-559.

10. Sanclemente G., Garcia JJ, Zuleta JJ et al. A double-blind, randomized trial of 0.05% betamethasone vs. topical catalase/dismutase superoxide in vitiligo // J. Eur. Acad. Dermatol. Venereol. - 2008. - Vol. 22, No. 11. - P. 1359-1364.

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