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# PROSPECTS FOR THE USE OF ZEOLITE CONTAINING GEOMIN FORTE IN THE TREATMENT OF COVID-19 AND POST COVID-19 CONDITION

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## ABSTRACT

The aim of the research was to study and analyze peculiarities and prospects for the use of zeolite containing Geomin Forte in the treatment of covid-19 and post covid-19 condition. Antioxidants are substances that the human body constantly needs in order to maintain it in a normal state, which means maintaining the necessary balance between free oxidative radicals and antioxidant forces, the role of which is played by antioxidants. Vitamin E increases the body's nonspecific resistance, and by activating the synthesis of cytokines, tocopherol stimulates its own anti-inflammatory activity. The effect of vitamin E is to stimulate the reproduction of immune cells, systems that need to quickly multiply when they meet the source of a possible disease. In the body, this process is called mitogenesis.

The pharmacodynamic effects of tocopherol are synergistic when combined with vitamins C and A. Retinol provides formation of immune (protective) cells, lining respiratory tract and gastrointestinal tract, serving as a natural barrier to infection. Medicine will enhance possibilities of adaptation of the organism to the changed environment, because, in many cases, it is very difficult to protect the population from the impact of the negative factor (including ionizing radiation, natural disasters, etc.) According the study results "Geomin Forte" can be used during intoxications (used as the best sorbent for food, infectious, occupational intoxications, chronic metals and chronic exposure to radiation). As well as when the functional state of the immune system is impaired and fatigue and as an adjunct for allergic diseases. The mineral zeolite (clinoptilolite), the 500 mg activated clinoptilolite "Geomin Forte" developed by us is characterized by antioxidant action. Unlike the conventional antioxidants, it stimulates the body's endogenous antioxidant system and is a direct-acting oxidoreductive agent. Its activated natural mineral zeolite (clinoptilolite) acts directly on the cell membrane as a surface-active donor of electrons. With its oxidizing effect, "Geomin Forte" is 200 times more than vitamins C and E. Used in combination with antioxidant therapy in the context of standard treatment for the following diseases: Diabetes mellitus, accelerated aging process; alzheimer's disease; parkinson's disease; endocrine pathologies; atherosclerosis and ischemic heart disease, hypertensive disease, stroke, rheumatism.

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**Introduction.** In the case of COVID-19 infections, the main target of the coronavirus was the respiratory system. It is proven that coronavirus invades the parenchyma of the lungs and bronchial epithelial cells, it uses the angiotensin converting enzyme-converting enzyme (ACE-2) on the outer membrane of the cell as a binding receptor. Thus, the task of the researchers is to break the interaction of the virus with ACE2, which, in addition to reducing the penetration of the coronavirus into the lungs, also ensured the maintenance of the protective effect of ACE2. SARS-CoV-2 Virology Review: The causative agent of COVID-19 is a new coronavirus, officially named SARS-SV-2. It is named after SARS-COVID because of its genomics. Coronaviruses are large positive-sense RNA (+ mRNA) viruses of the coronavirus family. Corona virus can infect a wide range of vertebrates, including bats, birds, psoriasis, snakes, mice and humans. Due to the similarity of coronavirus transmission sequences in bats, SARS-CoV-2 is currently considered to be of zoonotic origin and has acquired a secondary ability for human-to-human transmission. In particular, the detection of mutations in the receptor binding region, the position of the beta multireceptor at the interface of protein subamendments 1 and 2 and the O-glycosylation site, where the virus can interact effectively with high convergence of true cellular receptors [Angiotensin 2 [ACE-2] bypasses the immune response and possibly masks O-glycylation [1-3].

Members of the Microbial World: Viruses and humans coexist relatively peacefully, but viruses cause various diseases. The genetic components of the virus are in a protein coat that can enter the cells of a living organism, and the virus continues to live on its own inside the cell. This fact did not remain hidden from science, scientific research began a long time ago and continues to this day [4-5].

According evolutionary measurement of the microbial world, in fact, it took a while to work out to developed very diverse and very "smart" mechanisms or in order to neutralize antibiotics. The microbe does this because of it is alive, developing and adapting. World Health Organization nowadays are precisely that, after about 20-25 years we may not be able to use antibiotics at all, because they may no longer be effective against bacteria [6-7].

Human immune system is the main opponent of the coronavirus and has protective function, which uses various mechanisms against the invading virus. However, it has been known that the mechanisms of subtle regulation of the immune system under the influence of viruses can be disrupted and develops autoimmune processes. In such a case, the immune system may become the main threat and the autoantibodies (or so-called Cytokines, interleukins, interferons, etc.) produced by them can damage the human body [8].

The biologically active substances that increase immunity and have an antioxidant effect are, first of all, all vitamins, especially the antioxidant series (vitamin C, carotene, vitamin E), B vitamins, as well as phenolic compounds with P-vitamin and antioxidant activity (catechins, flavanols, anthocyanins, hydroxycinnamic acids, etc.), polyphenolic substances (tannins), minerals (especially selenium, zinc, iron, iodine, potassium, calcium, etc.), chlorophyll (a and b), terpenoids, essential oils, resins, glycosides with an adaptogen effect, polyunsaturated fatty acids, essential amino acids (especially sulfur-containing ones), complete proteins, ballast substances (dietary fiber, pectin, inulin), fermented foods, etc. The carriers of these substances are mainly products of plant origin (fruits, berries, vegetables), wild berries, medicinal and technical plant materials, natural spices, algae, flower pollen. In this section, we will consider in sufficient detail almost all groups of these substances and their content in plant materials and food products, their therapeutic and prophylactic effect and role in a healthy diet [9-10].

Antioxidants are substances that the human body constantly needs in order to maintain it in a normal state, which means maintaining the necessary balance between free oxidative radicals and antioxidant forces, the role of which is played by antioxidants. Free radicals, or simply radicals, are molecules or fragments of molecules that contain a so-called unpaired electron in their outer orbit. The presence of such an unpaired electron means that the radicals having it are highly reactive, and the high level of formation of such highly reactive radicals in cells and tissues leads to oxidative damage to key components of cells. This variant of damage by free radicals has been known for a long time, it is called "oxidative stress" [11-12].

Vitamin E increases the body's nonspecific resistance, and by activating the synthesis of cytokines, tocopherol stimulates its own anti-inflammatory activity. The effect of vitamin E is to stimulate the reproduction of immune cells. Systems that need to quickly "multiply" when they meet the source of a possible disease. In the body, this process is called mitogenesis. The pharmacodynamic effects of tocopherol are synergistic when combined with vitamins C and A. Retinol provides formation of immune (protective) cells, lining respiratory tract and gastrointestinal tract, serving as a natural barrier to infection [13].

Vitamin C, together with its metabolite, dehydroascorbic acid, forms a redox system that transports hydrogen ions. Ascorbic acid is involved in the synthesis of collagen, hyaluronic acid, steroid hormones, norepinephrine, carnitine, iron absorption from the intestine and its incorporation into heme, activation of metalloenzymes, formation of active vitamin D metabolites, being its synergist. Vitamin C is able to increase the amount of nitric oxide in the endothelium, preventing its destruction and increasing its synthesis. Vitamin C, interacting with tocopherol and glutathione, is one of the leading components of the biological antioxidant system. The stimulating effect of vitamin C on the activity of cytochrome P-450, the key enzyme of hydroxylation and peroxidation, has been proven. Vitamin C in the form of ascorbate ion is the most important endogenous antioxidant in blood plasma, it protects lipids from oxidation by peroxide radicals. Vitamin C is an immediate antioxidant known as a "radical scavenger". In addition, ascorbic acid prevents the oxidation and destruction of other important antioxidants, vitamins E and A. High concentrations of ascorbic acid are found in metabolically active organs and tissues: adrenal glands, lens, cornea, kidneys, brain, pancreas, as well as in platelets and leukocytes [14].

Future clinical trials are necessary, but with preliminary recommendations already proven in practice. Such patients should be treated in the same way as autoimmune diseases - with the use of hydroxychloroquine, corticosteroids and interleukin inhibitor (tocilizumab or anakinra).

**Aim and objectives of the research.** The aim of the research was to study and analyze peculiarities and prospects for the use of zeolite containing Geomin Forte in the treatment of covid-19 and post covid-19 condition.

**Material and methods.** The material of the article was data from the scientific literature, processed and analyzed by generalization and systematization. The scientific research ensues the fundamentals of assessment development of significant reviews. Were used the ensuing databases (for searching considerable literature for prospects of the using of zeolite containing Geomin Forte in the treatment of covid-19 and post covid-19 condition): PubMed, Web of Science, Clinical key, Tomson Routers, Google Scholar, Cochrane Library, and Elsevier bases. Additionally studied national and international policy and guidelines and also grey literature.

**Results and discussion.** Medicine is looking for remedies that will enhance possibilities of adaptation of the organism to the changed environment, because, in many cases, it is very difficult to protect the population from the impact of the negative factor (including ionizing radiation, natural disasters, etc.)

Biologically active food supplements ("Geomin", "Phytomin", "Geomin Forte") can be used in combination with traditional medications for the treatment, rehabilitation and prevention of diseases caused by various factors.

According to the pharmacotherapeutic outcomes, here we note that a series of drugs based on clinoptilolite ("Geomin", "Phytomin", "Geomin Forte") are used in combination antioxidant therapy and the positive effect is based on the strong sorbent properties of these drugs.

It is known that Zeolites are porous minerals that have a high absorption and ion exchange capacity. Their molecular structure is a dense network of  $AlO_4$  and  $SiO_4$ , forming cavities in which water and other polar molecules or ions can enter / exchange. Although there are several synthetic or naturally occurring types of zeolite, the most common and studied is natural zeolite clinoptilolite (ZC). ZC is an excellent detoxifying, antioxidant and anti-inflammatory agent [15-16].

Structural zeolites (clinoptilolites) are from the family of aluminosilicates and cations that are grouped together to form macro aggregates in separate cavities. In the medical field they are involved in the detoxification mechanisms of ions and molecules through their holes. In fact, we make about 140 types of natural and 150 synthetic zeolites for specific and selective use. Clinoptilolite is a natural zeolite most commonly found in the pharmaceutical market and used in medicine to compensate for pathological oxygen starvation in the tissues of the human body [17-18]

Natural zeolites are crystalline aluminosilicates with unique adsorption, cation exchange, and catalytic properties that have several uses. Clinoptilolite of natural zeolite, with enhanced physicochemical properties, is the basis of megamine and lycopenomine in food supplements, which have been shown to have antioxidant activity in humans. Investigation of the effect of TMAZ supplementation on the immune system in patients treated for immunodeficiency disorder. A total of 61 patients received daily TMAZ doses of 1.2 g (lycopenomine) and 3.6 g (megamine) for 6 to 8 weeks, during which time the patients' primary medical therapy remained unchanged. Megamine intake significantly increased the number of CD4 +, CD19 + and HLA-DR + lymphocytes and

significantly decreased the number of CD56 + cells. Lycopomine is associated with increased CD3 + cell count and CD56 + lymphocyte count. No negative reactions were observed [19-20].

We thought we had defeated the bacterial world. Less than 100 years have passed and we have encountered a problem - this strong bacterial resistance Towards preparations. It became necessary to create new vaccines and treatments. Also in focus is the post-Covid period, as the medical community and science have faced many undesirable syndromes.

Considering the above-mentioned properties of the mineral zeolite (clinoptilolite), the 500 mg activated clinoptilolite "Geomin Forte" developed by us is characterized by antioxidant action. Unlike the conventional antioxidants, it stimulates the body's endogenous antioxidant system and is a direct-acting oxidoreductive agent. Its activated natural mineral zeolite (clinoptilolite) acts directly on the cell membrane as a surface-active donor of electrons. With its oxidizing effect, "Geomin Forte" is 200 times more than vitamins C and E [21-22].

Therefore, it can be used during intoxications (used as the best sorbent for food, infectious, occupational intoxications, chronic metals and chronic exposure to radiation). As well as when the functional state of the immune system is impaired and fatigue; And as an adjunct for allergic diseases;

- In case of impaired gastrointestinal tract and liver function, hepatitis (improves general condition).
- In women and men with pre-and menopausal nervous disorders and impaired ability to work;
- Recommended as an additional source of minerals (calcium, magnesium).
- Recommended as adjunctive therapy in oncology patients - for elimination of side effects of chemical and radiation therapy. (Reduction and disappearance of hair loss, intoxication events, nausea, vomiting, toxic polyneuropathy; stimulation of bone marrow function);
- Skin diseases (it is recommended to apply the powder externally on wounds or damaged parts of the skin several times a day).
- Used in combination with antioxidant therapy in the context of standard treatment for the following diseases: Diabetes mellitus; Accelerated aging process; Alzheimer's disease; Parkinson's disease; Endocrine pathologies; Atherosclerosis and ischemic heart disease; Hypertensive disease; Stroke; Rheumatism;

We have mentioned that it is 200 times more than vitamins C and E, and here we also mention that vitamin E is an antioxidant -and also vitamin C has an antioxidant features. It has the ability to protect various substances from oxidative changes, inhibits the metabolism of proteins, nucleic acids and steroids

- To maintain muscle function, for the vascular and endocrine systems;
- Protects against heart and nervous diseases, the harmful effects of smoking and polluted air;
- To maintain a youthful appearance, to slow down the aging process of cells;
- Dilates blood vessels;
- Protects the lungs from air pollution;
- prevents the appearance of blood clots;
- Accelerates burn healing;
- Acts as a diuretic and can lower blood pressure;
- Protects the fetus from miscarriage.

There is also a lot of talk that vitamin C plays a big role in the prevention of Covid-19. In an interview with the New York Times Parenting, William Schaffner, a professor at Vanderbilt University, says that this vitamin may not protect us from colds, but it is important for our overall health and the fight against infections. Vitamin C promotes the normal functioning of the immune system. It works as an antioxidant and neutralizes free radicals that appear in the body as a result of normal metabolism and exposure to external factors, including ultraviolet rays and environmental pollution.

Ascorbic acid or vitamin C is known to be a powerful antioxidant. It regulates blood clotting, regulates capillary permeability, participates in blood formation, acts against inflammation and allergies, regulates the problems caused by stress, strengthens reparative (recovery) processes, increases resistance to infections. Among the positive properties of vitamin C, our attention was drawn to the characteristics that are most pronounced in patients with Covid-19 and for the post-Covid period:

- Reduces blood cholesterol levels;
- Protects against many viral and bacterial infections;
- Reduces the chance of blood clots;

Our attention was drawn to the features that are most evident in Covid-19 disease and today, when postcoid syndrome, also known as Long Covid, is often observed:

- Fatigue
- Difficulty breathing, cough or shortness of breath
- Smell / taste loss (anosmia)
- Headache, muscle and joint pain
- Problems of concentration and memory
- Nerve disorders (neuropathies)
- Depression and anxiety disorders
- Sleep disorders

Also known as critically severe current COVID-19: need for controlled breathing (non-invasive or invasive ventilation) during the following conditions: Severe pneumonia; Acute respiratory distress syndrome (ARDS); Sepsis/septicemia; Septic shock; Poly organ failure [23].

Based on study results, we hope that "Geomin Forte" developed by us, which has all the characteristics of vitamin C and vitamin E, and exceeds these properties by 200 times. We think that Geomin Forte will help to consider the diversity of symptoms of post-covid syndrome, and it will be quite flexible and creative to use it in the period of post-covid rehabilitation [24-25].

**Conclusions.** On the basis of the performed studies the following conclusions have been formulated:

Considering the above-mentioned properties of the mineral zeolite (clinoptilolite), the 500 mg activated clinoptilolite "Geomin Forte" developed by us is characterized by antioxidant action. Unlike the conventional antioxidants, it stimulates the body's endogenous antioxidant system and is a direct-acting oxidoreductive agent. Its activated natural mineral zeolite (clinoptilolite) acts directly on the cell membrane as a surface-active donor of electrons. With its oxidizing effect, "Geomin Forte" is 200 times more than vitamins C and E. Used in combination with antioxidant therapy in the context of standard treatment for the following diseases: Diabetes mellitus; accelerated aging process, Alzheimer's disease; Parkinson's disease, endocrine pathologies, atherosclerosis and ischemic heart disease, hypertensive disease, stroke, rheumatism.

**Recommendation.**

On the basis of the performed studies the following recommendation has been formulated:

So, "Geomin Forte" can be used during intoxications (used as the best sorbent for food, infectious, occupational intoxications, chronic metals and chronic exposure to radiation). As well as when the functional state of the immune system is impaired and fatigue and as an adjunct for allergic diseases.

**Statement of Conflicting Interests.** The authors announced, that there is no potential conflict of interest with regard to the research, and/or publication of this article.

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