

## PREVENTION OF THE DEVELOPMENT OF CHRONIC DISEASES IN THE ERA OF THE COVID-19 PANDEMIC: A SYSTEMATIC REVIEW.

**Abstract:** The article discusses the features of the prevention of chronic diseases in the era of the COVID-19 pandemic. It is known that patients suffering from various chronic diseases have weakened immunity, and this forces doctors to attribute such patients to the risk group, whose participants are most susceptible to the severe course of coronavirus disease.

In light of all the above, the main task of medical workers today is to prevent the development of chronic diseases as such, and therefore the prevention of chronic diseases in general is a priority for medicine today. An attempt to preserve the health of the nation and prevent the mortality rate from increasing is the main task of doctors, secondary and junior medical personnel. That is why preventive work among the population, especially the older age group, should be carried out actively and systematically today.

**Keywords:** chronic diseases, prevention, priorities of medicine, pandemic, COVID-19.

**Introduction.** Chronic diseases are conditions of the body that negatively affect not only the state of human health, but also its performance. It is known that any disease is easier to prevent than to treat, which is why one of the golden rules of medicine is the prevention of diseases [1].

In modern conditions, the coronavirus infection is developing in waves, and in each of its waves more and more people get sick, who somehow miraculously managed to avoid infection at the first stages of the pandemic. Unfortunately, there are also people suffering from chronic diseases among such people, and it is this fact that often endangers their lives and reduces the immune response in the fight against coronavirus [2].

A person who takes appropriate measures to prevent the transition of an acute form of the disease into a chronic one or abandons bad habits or an incorrect lifestyle in order to avoid the occurrence and development of a chronic disease is most resistant to a new coronavirus infection, since he does not have a favorable environment for the development of viral mechanisms [3].

Accordingly, the purpose of the work is to consider the features of the prevention of chronic diseases in the era of the COVID-19 pandemic.

**Materials and methods.** When writing the work, the materials of the periodical press, scientific articles covering the prevention of chronic diseases in general and in the era of the development of coronavirus infection in particular were studied.

When summarizing the material, a comparative method, an analytical method, and a comparative research method were used.

The analytical section includes a study of the main directions of prevention by summarizing existing practices, as well as detailing the main approaches to the organization of preventive work in the field of chronic diseases. The method of deduction, comparison, interpretation and generalization have also been used.

**Results.** The features of a number of chronic diseases include patients suffering from them in a special risk group: they may become the likely victims of a new coronavirus infection and due to a weakened body by the disease.

Among the chronic diseases, some should be singled out, which have largely become widespread and are developing under the influence of a number of negative factors that can be limited. Let's consider the main consequences that arise when people become infected with coronavirus infection in various chronic diseases.

1. Cardiopathology. COVID-19 interacts with the circulatory system at several levels, increasing morbidity and causing myocardial damage and dysfunction in patients with cardiovascular diseases. SARS-CoV-2 infection is caused by binding of the surface spike protein of the virus to the human ACE2 receptor after the spike protein is activated by transmembrane serine protease 2. ACE2 is found in the lungs (mainly in alveolar type II cells) and, as a rule, is the main input port [5].

ACE2 is also strongly expressed in the heart, counteracting angiotensin 2, there are effects with extreme activation of the renin-angiotensin system, such as hypertension, atherosclerosis and congestive heart failure.. In addition to the heart and lungs, ACE2 is also found in the intestinal epithelium, kidneys, and vascular endothelium, providing the basis for the multi-organ dysfunction seen in SARS-CoV-2 infection. [5]

There is a lot of evidence that COVID-19 is associated with an increase in the severity of cardiovascular diseases and mortality from them. Concomitant diseases, including the cardiovascular system, are common in patients with COVID-19, and these patients have a higher risk of disease severity and mortality. However, it is not known whether concomitant cardiovascular diseases alone affect the risk of COVID-19 or whether other factors, such as age, are present. According to the US Centers for Disease Control and Prevention (CDC), 44,000 cases of laboratory-confirmed COVID-19 have been reported. It has been shown that cardiovascular diseases, old age, diabetes, cancer, chronic respiratory diseases and hypertension are all associated with an increased risk of morbidity and mortality [6].

It has been observed that the risk of death is strongly associated with coronary heart disease, hypertension, diabetes mellitus and multiple organ failure.

2. Respiratory disease. The presence of respiratory diseases, such as asthma and tuberculosis (TB), was included in the list of potential risk factors indicating the severity and mortality from COVID-19.

Asthma is widely recognized as an important risk factor for serious respiratory diseases in patients with COVID-19, especially in the United States. There is an evidence that asthma and COVID-19 patients are overrepresented among adult hospitalized patients. Such overrepresentation may occur due to the fact that SARS-CoV-2 causes an exacerbation of asthma, like other viruses, therefore asthma is defined as a risk factor for concomitant pathology COVID-19.

Another study showed that a 37-year-old man suffering from asthma had a lung autopsy that met the clinical criteria for severe acute respiratory distress syndrome; he died from COVID-19 less than 2 weeks after going to the hospital. His lungs showed mucus blockage and other histological changes associated with asthma, as well as early diffuse alveolar damage and fibrous pneumonia. Diffuse alveolar lesion is common in patients diagnosed with influenza virus, including influenza A / H1N1, and is often accompanied by a combination of bleeding, acute bronchopneumonia with a predominance of neutrophils, peripheral pulmonary macroscopic thrombosis and hemophagocytosis.

The most common symptoms associated with COVID-19 - fever, dry cough and shortness of breath - are also normal during asthma exacerbation. The study showed that in patients with COVID-19, the prevalence of asthma is 14%. Patients with asthma should be advised to use appropriate PPE to reduce the risk of the disease.

Similarly, tuberculosis is also a severe bacterial disease that mainly affects the lungs of infected patients. There is evidence that patients with latent tuberculosis infection and tuberculosis have an increased risk of SARS-CoV-2 infection and are predisposed to severe COVID-19 pneumonia. Since the entrance portal for both TB and COVID-19 is the upper respiratory tract, the relationship between serious influenza co-infection and pulmonary tuberculosis remains unclear [7].

Similarly, the clinical case report noted that the course of the disease in elderly patients with tuberculosis easily progressed to a severe type of COVID-19, and the patients had a long recovery process. These reports inform us about the risk of tuberculosis co-infection in COVID-19 patients who are recovering poorly; they also show the importance of effective steroid use for patient management. It should be emphasized the importance of primary prevention measures, especially in patients with tuberculosis. Hospitals and TB centers should be prepared for the early detection and treatment of serious COVID-19 [8].

3. Diabetes mellitus. Diabetes is an important cause of mortality and morbidity worldwide. The condition is associated with several macrovascular and microvascular complications that ultimately affect patient survival. The link between diabetes and infection, especially influenza A (H1N1), SARS-CoV, MERS-CoV and pneumonia is a normal link, but it can affect older people with DM (T2DM). According to current information, patients with type 2 diabetes mellitus (DM2) are most likely not at a higher risk of contracting SARS-CoV-2 than the general population. However, the characteristics of patients with diabetes with a high risk of developing severe and severe forms of COVID-19, as well as the prognostic effect of diabetes on the course of COVID-19 are currently being studied

Infection with SARS-CoV-2 in diabetic patients probably stimulates increased stress due to the release of hyperglycemic hormones, such as catecholamines and glucocorticoids, which leads to an increase in blood glucose levels, as well as glucose inconsistency. Moreover, a retrospective study from Wuhan showed that about 10% of patients with DM2 and COVID-19 experienced at least one attack of hypoglycemia ( $<3.9$  mmol/L) [9].

As the pandemic spreads to other continents, data from Europe and America have shown an alarming relationship between DM and the COVID-19 forecast. A study of 1,099 patients with COVID-19 was conducted in China, the results of which showed that 16.2% of patients suffered from diabetes, 23.7% from hypertension, 2.3% from cerebrovascular diseases and 5.8% from coronary heart disease. Similarly, another study involving 140 patients showed a similar incidence of hypertension (30%) and DM (12%). [9]

In Belgium, more than half a million people were diagnosed with DM2, and 20% of them were over 65 years old. Similarly, a French study found that diabetes affects more than 3 million people, mainly as DM2, with 25% of them over the age of 75. In Hong Kong, the first three COVID-19-related deaths were reported among people with diabetes. A study of 1,099 laboratory-confirmed cases of COVID-19 showed that 173 patients (16%) had severe diabetes, and the remaining 926 patients (5.7%) had mild diabetes. Similarly, 24% of patients with severe disease had hypertension compared to 13% among patients with mild disease, highlighting the increased risk of infection among those with chronic diseases such as diabetes. DM was associated with death and severity of the disease in patients with COVID-19.

4. Oncological diseases. The COVID-19 outbreak has infected thousands of people in at least 186 countries, while not only the health care system has been affected, but also the cancer care system. Cancer patients are more vulnerable to COVID-19 than healthy people due to a suppressed immune system as a result of a malignant tumor or cancer therapy. In addition, cancer patients are often older (60 years old) with one or more serious comorbidities, which puts them at greater risk of morbidity and mortality associated with COVID-19. [9]

In addition, as a result of frequent visits to the doctor for antitumor treatment, cancer screening, as well as preventive and supportive treatment, they also have high rates of interaction with the healthcare system. Thus, there is a concern that the possible coexistence of cancer diagnosis and COVID-19 infection may have a synergistic negative prognostic effect.

The mortality and morbidity rates of COVID-19 were significantly higher among people with a history of cancer (39%) than among people without such a history (8%) ( $p = 0.0003$ ). Similarly, a 57-year-old Chinese male patient with lung cancer was found to have COVID-19 with symptoms of the disease such as fever, shortness of breath, cough, diarrhea and myalgia.

Cancer patients need constant treatment, so it is not a privilege to undergo a medical examination or clinical treatment; their future exposure to COVID-19 may be risky or even fatal. Significant steps are being taken to identify the unique characteristics of cancer patients who have contracted the new hepatitis C virus, to eliminate diagnostic and therapeutic barriers, and to develop guidelines to protect this vulnerable population from both exposure to the virus and the progression of the disease as a result of delays in testing and treatment. [9]

5. Hypertension. Hypertension has been reported to significantly increase the incidence and morbidity of patients with new CoV. However, early studies of COVID-19 reported mixed results regarding hypertension. It was found that hypertension is associated with an increase in the risk of both morbidity and mortality by  $\sim 2.5$  times, and is usually found in people over 60 years of age. Similarly, the incidence of hypertension is high in patients affected by COVID-19 and is generally associated with an increased risk of mortality and morbidity. Early data from the United States and China show that hypertension is usually the most common comorbidity in at least 30-49% of patients hospitalized with COVID-19. [10]

Patients with hypertension who have improved COVID-19 are more likely to be hospitalized than people with normal blood pressure. According to studies conducted by specialists during the first quarter of 2021 in Switzerland, hypertension was detected in 23.7-30% of patients admitted with COVID-19 associated with a more serious infection. Similarly, a study from Italy, which studied patients admitted to the intensive care unit, showed that 49% suffered from hypertension.

Similar to flu and SARS-CoV outbreaks, the incidence and mortality from COVID-19 is higher among the elderly. However, since hypertension is closely related to age, an alternative definition is damage to target organs in patients with hypertension. As a result of hypertension, a number of pathophysiological changes occur in the cardiovascular system, such as fibrosis and hypertrophy of the left ventricle, which make the hypertensive heart susceptible to SARS-CoV-2 [10].

Scientific and epidemiological characteristics of COVID-19 have been repeatedly published, which show specific concomitant diseases associated with the severity and mortality from COVID-19. It was reported that the most common concomitant diseases are hypertension (30%), coronary heart disease (8%) and diabetes (19%). Another study showed that the most common concomitant diseases in COVID-19 patients with established acute respiratory distress syndrome were hypertension (27%), cardiovascular diseases (6%) and diabetes (19%). In Italy, out of 1,591 ICU patients treated between February and March 2020, 49% had systemic hypertension. Hypertension in elderly patients should be considered as a clinical indicator of the severity and mortality from COVID-19.

Thus, studies confirm the fact that patients with chronic diseases are most susceptible to coronavirus infection. In this regard, the prevention of such diseases is very important.

**Discussion.** Among the preventive measures in the current situation, the first place should be given to the development of sanitary literacy of the population. The importance of health literacy, healthy behavior, self-defense and improving health has become clearer precisely during the pandemic.

The concept of health literacy is defined as social and cognitive skills that determine a person's motivation and ability to access health-related information, understand it and use this information to improve health.

Health literacy is a central issue for health systems, which must be prepared for situations requiring rapid response in the fight against diseases. In studies conducted before the pandemic, the level of health literacy of older people was different. Some studies have reported that the majority of elderly people had insufficient or limited level of health literacy [11].

For example, a study conducted in Ontario, Canada, showed that more than 82% of older people do not have sufficient health literacy. Another study conducted with 1,396 elderly people in China found that the level of health literacy of the elderly was low.

According to the study of the level of medical literacy and related factors, even in some European countries, the level of sanitary literacy of 24.9% of elderly people was problematic, and 65.5% of them had insufficient sanitary literacy. However, it is precisely well-learned provisions in the field of health literacy that will help reduce the level of chronic diseases and increase the degree of protection against coronavirus. [11]

Along with the development of medical and sanitary literacy, healthy lifestyle skills should also be instilled in the population.

1. Increase the number of regular exercises. It is known that a sedentary lifestyle entails the development of cardiological diseases, as well as hypertension. For this reason, the population should carefully approach the need for sports, both in organized groups and independently. This will help strengthen the heart muscle, blood vessels, reduce blood pressure and strengthen the immune system.

2. Use environmentally friendly foods and reduce the amount of trans fats consumed. It is proper nutrition that helps to reduce the incidence of almost all serious diseases, which can then turn into a chronic form. There is a well-known saying: "We are what we eat." Accordingly, nutrition directly affects the formation of immunity, a decrease in which entails the development of chronic ailments and a high susceptibility to coronavirus disease.

3. Eliminate bad habits. Alcohol consumption and tobacco smoking are the main problems of our time, especially among young people. In this regard, it is necessary to reduce the use of these products in order to preserve health and prevent serious diseases from developing [12].

**Conclusion.** An active fight against chronic diseases will reduce their number several times, which will lead to a weakening of the immune system of the population. A high level of health literacy allows a person to get accurate health information from reliable sources, better understand the causes of the existing disease and take precautions. Health literacy can help protect people's health and improve their quality of life during the COVID-19 pandemic. Therefore, health literacy should be seen as an important tool to mitigate and contain the current pandemic and potential future pandemics.

Also, as part of the prevention of chronic diseases, it is necessary to promote a healthy lifestyle, the use of proper food and the reduction of bad habits, for example, smoking.

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