



## Significance of Timer Medication Box and Daily Blood Pressure Profile in Pharmactherapy of Hypertension after Covid-19 Transfer

*Islombek Bahtiyor O'gli Bektashov, Irodakhon Mahkambaevna Tashtemirova,  
Qodirova Gulchehra Ibrohimovna*

*Lecturer, Andijan State Medical Institute, Uzbekistan*

**Annotation:** Since December 2019, when the first case of SARS was detected in China, the first data on the peculiarities of the course of infection in patients with various diseases have appeared.

In particular, there have been reports of a greater susceptibility to infection of people with cardiovascular diseases and, in particular, with arterial hypertension, and a significantly higher risk of developing adverse outcomes in this group of patients. We present an analysis of the currently available publications concerning coronavirus infection in people with arterial hypertension.

The article describes the risks and approaches to the management of such patients against the background of coronavirus infection in patients with hypertension, including those associated with antihypertensive therapy (including blockers of the renin-angiotensin-aldosterone system), as well as the role of the timer box in its daily monitoring profile when blood pressure increases.

**Keywords:** arterial hypertension, COVID-19, pharmacotherapy, timer drug box.

### Introduction

Hypertension is the most common disease of the cardiovascular system in many countries of the world [4]. Hypertension accounts for at least 90-95% of all cases of arterial hypertension [6]. Therefore, the prevalence of hypertension in a given population can be judged by the frequency of detection of high blood pressure - BP (i.e., systolic blood pressure - at least 140 mm Hg and / or diastolic blood pressure - at least 90 mm Hg. Art. ) during repeated measurements [3]. In the United States, for example, according to a large-scale epidemiological survey conducted in 1988-1991, elevated blood pressure ( $\geq 140/90$  mmHg) occurred in approximately 25% of the adult population [1].

The prevalence of arterial hypertension was only 4% among people aged 18-29, but it increased sharply after 50 years. Among people aged 50-59 years, the prevalence of arterial hypertension (i.e. essentially hypertension) was 44%, among people 60-69 years old - 54% and among people 70 years and older - 65% [5].

In the late 1980s, the US Joint National Committee on the Detection, Evaluation and Treatment of High Blood Pressure tightened the criteria for diagnosing hypertension.

In his Fourth Report (1988), he recommended referring to arterial hypertension those cases when the level of systolic blood pressure, according to repeated measurements, is at least 140 mm Hg. st[2]. In the Fifth Report of the Joint National Committee on the Detection, Evaluation and Treatment of High Blood Pressure in the United States (1993), when diagnosing arterial



hypertension, it is recommended to take into account the average values of not only diastolic, but also systolic blood pressure [6].

For the diagnosis of arterial hypertension, it is considered sufficient that at least two measurements of blood pressure during at least two visits to the doctor mean systolic blood pressure values were at least 140 mm Hg. Art. and (or) diastolic blood pressure - at least 90 mm Hg. Art.

At the time of this writing, the official statistics of victims of coronavirus infection (COVID-19) is as follows: infected - 1,093,103, deaths - 58,729, recovered - 228,039, although a significantly higher number of infected can be assumed, given that diagnosis is carried out in only a part of patients. From the beginning of December 2019, when the first case of SARS was detected in Wuhan, China (the first official announcement was published on December 31, 2019 [4]), until the end of March 2020, the number of infected people has been steadily increasing, which led to the declaration of a pandemic by the World Health Organization (WHO).

The causative agent, a new single-stranded RNA-containing betacoronavirus named SARS-CoV-2, belongs to a large family of Coropaviridae, two members of which, SARS-CoV and MERS-CoV, have already caused outbreaks of acute respiratory syndrome cases associated with high mortality in the past. [2].

**Purpose of the study.** The aim of the study is to study the circadian blood pressure profile and the role of the block of counter drugs in the pharmacotherapy of hypertension after COVID-19.

#### **Materials and Research Methods**

We analyzed 100 electronic medical records of eligible patients under 65 years of age with hypertension who were admitted to the hospital with a positive PCR test for COVID-19.

#### **Results and Discussions**

One possible explanation for the low prevalence of hypertension in patients with COVID-19 is that SARS-CoV-2 uses ACE 2 (ACE-2) receptors to enter cells, and in patients with AD and those receiving inhaled CS, there is decreased expression of the ACE-2 gene in cells of the respiratory tract and reduced the risk of COVID-19.

Initially, all patients with CVD were assigned to the risk group, and, according to current Russian clinical guidelines, patients with hypertension require hospitalization even with mild COVID-19. However, more and more articles appear, the authors of which suggest that hypertension not only does not contribute to the severe course of a new coronavirus infection, but can also have a protective effect. In addition to the above features of pathogenesis, there are data indicating a decrease in the expression of angiotensin-converting enzyme 2 (ACE2) receptors, which are the target for the virus, in patients with atopic hypertension and in patients receiving ICS.

Activation of the renin-angiotensin-aldosterone system (RAAS) plays an important role in the occurrence and progression of hypertension, the formation of atherogenesis, the development of left ventricular hypertrophy, coronary artery disease, remodeling of the heart and blood vessels, rhythm disturbance, up to the development of terminal chronic heart failure and MI.

That is why angiotensin converting enzyme inhibitors (ACE inhibitors) or angiotensin II receptor blockers (ARBs), which are RAAS blockers, should be considered drugs of choice in patients at high and very high risk.

It should be noted that in terms of the number of prescriptions of antihypertensive drugs, ACE inhibitors are in the first place, which have properties necessary for the treatment of hypertension at



the modern level: they effectively reduce blood pressure, reduce damage to target organs, improve quality of life, are well tolerated and do not cause serious adverse reactions.

All ACE inhibitors are divided into three groups depending on the presence of an ending in their molecule for attaching to the zinc-containing receptor of cell membranes:

1st group: SH-containing ACE inhibitors (captopril, zofenopril);

2nd group: containing a carboxyl group of ACE inhibitors (enalapril, perindopril, benazapril, lisinopril, quinapril, ramipril, spirapril, cilazapril);

3rd group: containing a phosphate group (fosinopril).

The active drugs are captopril and lisinopril, the rest are prodrugs that are converted in the liver into active metabolites and have a therapeutic effect.

The mechanism of action of ACE inhibitors is to bind zinc ions in the ACE active center of the RAAS and block the conversion of angiotensin I to angiotensin II, which leads to a decrease in RAAS activity both in the systemic circulation and at the tissue level (heart, kidneys, brain). Due to ACE inhibition, the degradation of bradykinin is inhibited, which also contributes to vasodilation.

Cardiac lesions in hypertension include left ventricular hypertrophy and diastolic dysfunction. The presence of left ventricular myocardial hypertrophy several times increases the risk of developing all complications of hypertension, especially chronic heart failure, according to the Framingham study, the risk of which increases by 4-10 times. Criteria for left ventricular hypertrophy: on the electrocardiogram - Sokolov-Lyon sign ( $Sv1 + Rv5$ ) more than 38 mm, Cornell product ( $Sv3 + RavL$ )xQRS - more than 2440 mm / ms; on echocardiography - the mass index of the myocardium of the left ventricle in men - more than 125 g / m<sup>2</sup>, in women - more than 110 g / m<sup>2</sup>. ACE inhibitors are leaders among antihypertensive drugs in terms of regression of left ventricular myocardial hypertrophy.

Thus, it becomes clear why the current statistics usually do not include BA in the list of the most common nosologies in severe COVID-19.

The phenotype of severe hypertension in combination with obesity (and the corresponding IL-6/Th17 endotype) seems to be the most dangerous in relation to COVID-19. In these patients, the expression of ACE2 receptors, membrane-bound serine protease (TMPRSS2) and CD127, with the help of which SARS-CoV-2 enters the cell, is increased. Obesity is a recognized risk factor for severe AD. In addition, IL-6 plays an important role in the cytokine storm in severe COVID 19.

In the current epidemic conditions, it is recommended to especially carefully consider the causes and course of exacerbations of the disease and, if the slightest deviations from the usual development or unusual symptoms appear, direct efforts to exclude COVID-19. Fever, weakness, loss of touch or taste, absence of dry wheezes should be alarming factors. The diagnosis of COVID-19 in patients with hypertension does not differ from that in other groups of patients.

All patients with hypertension should receive optimal therapy aimed at achieving disease control, especially in a pandemic. According to current Russian recommendations, if a patient with hypertension develops COVID-19 infection, basic therapy should be maintained in the same volume as before the infection.

For patients receiving systemic glucocorticosteroids as basic therapy, the European Association of Allergists and Clinical Immunologists recommends continuing the use of this group of drugs at the minimum required dose.



Treatment of COVID-19 is carried out in accordance with the severity of the infection and does not require additional correction in patients with hypertension.

### Conclusion

The question remains whether it is worth starting antihypertensive therapy with RAAS blockers during a pandemic in previously untreated patients with newly diagnosed hypertension. Currently, in the absence of other evidence, the decision should take into account the known beneficial cardiovascular effects of ACE inhibitors and ARBs, as well as their potential lung protective effects, and be guided by general clinical guidelines, as indicated by experts from the Heart Society (CS). Of course, monitoring of blood pressure (BP) and dose adjustment of drugs are indicated in case of a pronounced decrease in blood pressure, which can be observed in patients with acute respiratory infections.

Further studies are needed (experimental and clinical - observational and controlled with an assessment of outcomes and taking into account possible influencing factors, confounders), which will provide answers to questions about the role of the RAAS and its blockade in the development of lesions in SARS-CoV-2 infection.

### References

1. Irodakhon Makhkambaevna Tashtemirova. (2021). State Of Purine Exchange And Microalbuminuria In Patients With Metabolic Syndrome. *The American Journal of Medical Sciences and Pharmaceutical Research*, 3(01), 46–54. <https://doi.org/10.37547/TAJMSPR/Volume03Issue01-08>
2. Gudima G. O., Khaitov R. M., Kudlay D. A., Khaitov M. R. Molecular and immunological aspects of the diagnosis, prevention and treatment of coronavirus infection // *Immunology*. – 2021. – T. 42, No. 3. – p. 198-210.
3. Petrov D. V., Belevsky A. S. Management of patients with bronchial asthma during the COVID-19 pandemic // *Asthma and Allergy*. - 2020. - No. 1. –p . 6-11.
4. Fomina D. S., Serdoteckova S. A., Ivanova M. S. et al. Management of patients with COVID-19 and bronchial asthma: a review of the literature and clinical experience of the authors // *Practical Pulmonology*. - 2020. - No. 2. –p. 3-15.
5. Battle D, Wysocki J, Satchell K. Soluble angiotensin-converting enzyme 2: a potential approach for coronavirus infection therapy? *Clin Sci*. 2020;134(5)
6. Guo T, Fan Y, Chen M, Wu X, Zhang L, He T et al. Cardiovascular implications of fatal outcomes of patients with coronavirus disease 2019 (COVID-19). *JAMA cardiology*. 2020.
7. Wang L, He W, Yu X, Hu D, Bao M, Liu H et al. Coronavirus Disease 2019 in elderly patients: characteristics and prognostic factors based on 4-week follow-up. *J Infection*. 2020.
8. Irodakhon Makhkambaevna Tashtemirova. (2021). State Of Purine Exchange And Microalbuminuria In Patients With Metabolic Syndrome. *The American Journal of Medical Sciences and Pharmaceutical Research*, 3(01), 46–54. <https://doi.org/10.37547/TAJMSPR/Volume03Issue01-08>