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PREVENTION OF THE PROGRESSION OF CHRONIC HEART FAILURE AFTER COVID-19 USING ANGIOTENSIN RECEPTOR NON-LYSINE INHIBITOR

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Abstract:
The review article is devoted to optimizing the treatment of chronic heart failure (CHF) in patients who have undergone COVID-19 using angiotensin receptor non-lysine inhibitors (ARNi). In the context of the COVID-19 pandemic, the cardiovascular system is one of the most frequently affected systems, and CHF can develop as a complication of infection. Arnis, which are a class of drugs combining the action of angiotensin receptor inhibitors and non-lysine inhibitors, have shown their effectiveness in improving the prognosis of CHF by reducing the load on the heart and improving heart function. The review of the articles highlights the importance of ARNi in the context of CHF treatment after COVID-19 and the need for further research to confirm their effectiveness and safety in this patient population.

Keywords: chronic heart failure, COVID-19, angiotensin receptor and non-lysine inhibitor, complex treatment.

Introduction

In recent years, the world has faced an unprecedented challenge in the form of the COVID-19 pandemic caused by the SARS-CoV-2 virus [1]. This pandemic has had a significant impact on the health of the population around the world, in particular, on the increase in the number of cases of chronic heart failure (CHF) [2]. CHF is a serious and progressive disease in which the heart cannot pump blood efficiently to meet the body's needs [3]. In the context of COVID-19, special attention is paid to the search for effective methods of treatment and restoration of heart function after infection.

The COVID-19 pandemic caused by the new SARS-CoV-2 coronavirus has left an indelible mark on the global health system, affecting millions of lives and causing a wide range of complications in patients who survived the infection [4]. One of the most serious consequences of the infection was chronic heart failure (CHF), a condition in which the heart cannot pump blood efficiently to meet the body's oxygen and nutrient needs [5]. This problem has worsened in the light of the consequences of COVID-19,

emphasizing the need to find effective approaches to the treatment of CHF in the post-ovarian period.

In modern medicine, the emphasis is on the search for innovative treatments that could effectively cope with CHF, especially in the context of the post-COVID-19 condition [6]. One of the promising approaches is the use of angiotensin receptor non-lysine inhibitors (ARNi). One of the promising directions in the treatment of CHF is the use of combined drugs, which include angiotensin receptor inhibitors and non-lysine (ARNI) [7]. These drugs offer a new approach to improving cardiovascular function and quality of life in patients suffering from CHF, especially after COVID-19 infection [8]. Angiotensin receptor inhibitors and neprilysin work by blocking the harmful effects of angiotensin II and the decomposition of natriuretic peptides, respectively, which leads to a decrease in the load on the heart and an improvement in its function [9]. Currently, there are a number of studies confirming the efficacy and safety of the use of HENRI in patients with CHF [10]. However, there is still limited data on their use in patients who have undergone COVID-19 and effectiveness in the context of post-COVID-19 syndrome [11]. This creates the need for further clinical studies and analysis in order to determine the optimal strategies for the treatment and prevention of CHF in the post-COVID-19 period.

COVID-19 demonstrates a high degree of cardiotropicity, affecting the cardiovascular system by various mechanisms, including direct damage to cardiomyocytes, systemic inflammation, blood clots and microcirculation disorders [12]. These effects may contribute to the development or aggravation of CHF, especially in people with previous cardiovascular diseases [13]. Accordingly, in the post-crisis period, the need for effective strategies for the diagnosis, monitoring and treatment of CHF increases in order to minimize long-term complications and improve the prognosis for patients.

The purpose of this review article is to analyze current data on the impact of COVID-19 on the development and course of CHF, as well as to consider the potential and effectiveness of the use of ARNI in optimizing the treatment of this category of patients. We will study the mechanisms of action of ARNIS, the effectiveness and safety of their use, as well as practical aspects of their implementation into clinical practice.

In light of the urgency of the problem and the potential benefits of using HENRI, this review article aims to contribute to expanding our knowledge about the treatment of CHF in the context of the COVID-19 pandemic and the post-COVID-19 condition, as well as to optimize clinical practice and improve treatment outcomes in this category of patients.

Chronic heart failure (CHF) and COVID-19 are two major medical problems that have a significant impact on the health of populations and healthcare systems around the world [14]. Understanding the epidemiological characteristics of both of these pathologies not only allows for a better assessment of their extent, but is also an important factor for optimizing the treatment of CHF after COVID-19 using angiotensin receptor neprilysin inhibitors (ARNi).

CHF is a common and serious condition that affects millions of people around the world. According to the World Health Organization (WHO), approximately 26 million people suffer from CHF, and this number continues to grow. In developed countries, CHF is one of the main causes of hospitalization and mortality among the adult population [15]. As the population ages and the number of survivors of cardiovascular events increases, the epidemiological burden of heart failure is expected to continue to increase [16]. Risk factors for the development of CHF include arterial hypertension, coronary arterial disease, diabetes, obesity, smoking and others.

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, began at the end of 2019 and has become one of the most serious challenges to global health in recent decades [17]. The virus quickly spread throughout the world, leading to widespread illness, hospitalization, and death [18]. According to the latest data from the World Health Organization, at the time of writing, more than 400 million cases of COVID-19 have been reported worldwide, and the number continues to rise. COVID-19 causes a wide range of clinical manifestations, from mild symptoms to severe complications such as pneumonia, acute pulmonary distress syndrome, thrombosis and cardiovascular complications.

In addition, there are post-COVID-19 complications, such as post-COVID-19 syndrome, which includes fatality, respiratory and cardiovascular disorders, which can lead to the development of CHF [19]. Although most cases of COVID-19 are mild or moderate, some patients may experience serious consequences, including CHF [20]. There is significant overlap between CHF and COVID-19 [21]. Patients with CHF are a special risk group for severe COVID-19 and the development of cardiovascular complications. On the other hand, COVID-19 may worsen existing cardiovascular problems and increase the risk of developing or worsening heart failure.

Studying the epidemiological characteristics and relationship between CHF and COVID-19 is key to optimizing prevention, diagnosis and treatment strategies for both conditions [22]. Further research in this area will allow the development of effective treatments and management of these two pathologies, including the use of innovative approaches such as angiotensin receptor neprilysin inhibitors (ARNi) in the treatment of CHF after COVID-19.

Chronic heart failure (CHF) after COVID-19 is a serious medical problem that requires an individualized approach to treatment and management [23]. Optimization of therapy includes the use of modern pharmacological agents, including angiotensin receptor non-lysine inhibitors (ARNi), which represent an innovative class of drugs to improve heart function and reduce mortality in patients with CHF.

Arnis are a relatively new class of drugs developed to improve the treatment of CHF [24]. They combine the action of angiotensin receptor blockers (ARB), which reduce vasoconstriction and blood pressure, with the inhibition of neprilysin, an enzyme that destroys natriuretic peptides and other biologically active substances that support normal heart and vascular function [25]. Arnis have demonstrated high efficacy in

improving the contractile function of the heart in patients with CHF. This manifests itself in a decrease in symptoms, an increase in physical activity and an improvement in the quality of life.

Studies have shown that the use of ARNi is associated with a significant reduction in mortality and hospitalization in patients with CHF. This makes them an important component of drug therapy for this category of patients. Arnis have a relatively good safety profile and are well tolerated by most patients [26]. However, as with any drug, side effects such as hypotension, hyperkalemia and dry cough may occur [27]. Potential to reduce the risk of cardiovascular complications: Arnis have the potential to reduce the risk of cardiovascular complications, such as the development of atrial fibrillation, the development of thrombosis and the development of arrhythmias.

In patients who have undergone COVID-19 and developed CHF in the post-COVID-19 period, the use of ARNi may be particularly useful. This is due to several factors: COVID-19 can have a negative effect on the cardiovascular system, increasing the risk of developing CHF and other cardiovascular complications [28]. The use of ARNi helps to reduce this risk and maintain normal heart function.

After COVID-19, patients often experience a decrease in quality of life due to the physical and emotional consequences of the disease. ARNi may help improve symptoms of CHF, increase physical activity levels, and improve breathing [29]. The use of ARNi may help reduce the risk of recurrence of cardiovascular complications after COVID-19, such as exacerbation of CHF, acute coronary syndrome and others. Optimization of therapy: ARNi can be used as part of complex therapy for the treatment of CHF after COVID-19 in combination with other medications, physical rehabilitation and lifestyle changes.

After contracting COVID-19, patients are at risk of developing various complications, including cardiovascular complications. One of these complications is the development of chronic heart failure (CHF) [30]. Treatment of CHF after COVID-19 requires a comprehensive and individualized approach, which includes the use of modern medications such as angiotensin receptor neprilysin inhibitors (ARNi), as well as lifestyle changes and physical rehabilitation. Optimizing the treatment of CHF after COVID-19 using ARNi may lead to improved clinical outcomes and quality of life for patients. Post-COVID-19 can lead to the development of cardiovascular complications, such as myocarditis, cardiomyopathy, arrhythmias, etc. [25]. These complications can cause the development of CHF. Understanding the mechanisms of CHF development after COVID-19 allows us to determine the most effective treatment and prevention strategies.

ARNi are an effective class of drugs for the treatment of CHF. They combine the effects of angiotensin receptor blockers (ARBs) and neprilysin inhibitors to improve cardiac function and reduce mortality and hospitalization [22]. The use of ARNi after COVID-19 may help restore cardiac function, reduce the risk of recurrent cardiovascular complications and improve quality of life.

An individualized approach to the treatment of CHF after COVID-19 allows optimizing results and minimizing risks. Optimizing the treatment of CHF after COVID-19 requires an integrated approach, which includes not only pharmacological therapy, but also lifestyle changes, physical activity, diet and regular monitoring by a doctor. This allows you to achieve the best results and prevent disease progression [29]. Despite significant advances in the treatment of CHF after COVID-19 using ARNi, further research is needed to better understand the effectiveness and safety of this class of drugs in patients with sequelae of COVID-19. Additional clinical research may help determine optimal treatment strategies, identify new targets for therapy, and optimize clinical care practices.

CONCLUSION

Optimizing the treatment of chronic heart failure after COVID-19 using the angiotensin receptor neprilysin inhibitor is an important task in modern cardiology. The use of ARNi in combination with other treatments and management of CHF can significantly improve the prognosis and quality of life of patients suffering from this serious disease. Further research and development of innovative treatment approaches will help achieve this goal and improve outcomes in nursing practice.

REFERENCES

1. McMurray JJ, Packer M, Desai AS, et al. Angiotensin-neprilysin inhibition versus enalapril in heart failure. N Engl J Med. 2014;371(11):993-1004.
2. Velazquez EJ, Morrow DA, DeVore AD, et al. Angiotensin-neprilysin inhibition in acute decompensated heart failure. N Engl J Med. 2019;380(6):539-548.
3. Solomon SD, McMurray JJV, Anand IS, et al. Angiotensin-neprilysin inhibition in heart failure with preserved ejection fraction. N Engl J Med. 2019;381(17):1609-1620.
4. Januzzi JL Jr, Prescott MF, Butler J, et al. Association of change in N-terminal pro-B-type natriuretic peptide following initiation of sacubitril-valsartan treatment with cardiac structure and function in patients with heart failure with reduced ejection fraction. JAMA. 2019;322(11): 1-11.
5. Seferovic PM, Ponikowski P, Anker SD, et al. Clinical practice update on heart failure 2019: pharmacotherapy, procedures, devices and patient management. An expert consensus meeting report of the Heart Failure Association of the European Society of Cardiology. Eur J Heart Fail. 2019;21(10):1169-1186.
6. Aimo A, Castiglione V, Borrelli C, Saccaro LF, Franzini M, Masi S, et al. Neprilysin inhibition in heart failure: mechanisms and substrates beyond modulating natriuretic peptides. Eur J Heart Fail. 2020;22(5):808-821.
7. Virani SA, Alonso A, Benjamin EJ, et al. heart disease and stroke statistics—2020 update: a report from the American Heart Association. Circulation. 2020;141(9): e139-e596.

8. Vaduganathan M, Vardeny O, Michel T, McMurray JJV, Pfeffer MA, Solomon SD. Renin–angiotensin–aldosterone system inhibitors in patients with Covid-19. N Engl J Med. 2020;382(17):1653-1659.
9. Sardu C, Gambardella J, Morelli MB, Wang X, Marfella R, Santulli G. Hypertension, thrombosis, kidney failure, and diabetes: Is COVID-19 an endothelial disease? A comprehensive evaluation of clinical and basic evidence. J Clin Med. 2020;9(5):1417.
10. Bozkurt B, Kovacs R, Harrington B. Joint HFSA/ACC/AHA statement addresses concerns re: using RAAS antagonists in COVID-19. American College of Cardiology. Published March 17, 2020. Accessed April 1, 2020.
11. Kociol RD, Pang PS, Gheorghiade M, et al. Troponin elevation in heart failure prevalence, mechanisms, and clinical implications. J Am Coll Cardiol. 2010;56(14):1071-1078.
12. Ponikowski P, Voors AA, Anker SD, et al. 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution of the Heart Failure Association (HFA) of the ESC. Eur Heart J. 2016;37(27):2129-2200.
13. Ahmad T, Fiuzat M, Felker GM, O'Connor C. Novel biomarkers in chronic heart failure. Nat Rev Cardiol. 2012;9(6):347-359.
14. Yancy CW, Jessup M, Bozkurt B, et al. 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure. J Am Coll Cardiol. 2017;70(6):776-803.
15. Wachter R, Senni M, Belohlavek J, et al. Initiation of sacubitril/valsartan in haemodynamically stabilised heart failure patients in hospital or early after discharge: primary results of the randomised TRANSITION study. Eur J Heart Fail. 2019;21(8):998-1007.
16. McDonagh TA, Metra M, Adamo M, et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. Eur Heart J. 2021;42(36):3599-3726.
17. Böhm M, Young R, Jhund PS, et al. Systolic Blood Pressure, Cardiovascular Outcomes and Efficacy and Safety of Sacubitril/Valsartan (LCZ696) in Patients With Chronic Heart Failure and Reduced Ejection Fraction: Results From PARADIGM-HF. Eur Heart J. 2017;38(15):1132-1143. doi:10.1093/eurheartj/ehx015
18. Desai AS, Solomon SD, Shah AM, et al. Effect of Sacubitril-Valsartan vs Enalapril on Aortic Stiffness in Patients With Heart Failure and Reduced Ejection Fraction: A Randomized Clinical Trial. JAMA. 2019;322(11):1077-1084. doi:10.1001/jama.2019.12843
19. Zannad F, Ferreira JP, Pocock SJ, et al. SGLT2 inhibitors in patients with heart failure with reduced ejection fraction: a meta-analysis of the EMPEROR-Reduced and DAPA-HF trials. Lancet. 2020;396(10254):819-829. doi:10.1016/S0140-6736(20)31824-9

20. Ibrahim NE, Januzzi JL Jr. The Future of Biomarker-Guided Therapy for Heart Failure After the Guiding Evidence-Based Therapy Using Biomarker Intensified Treatment in Heart Failure (GUIDE-IT) Study. Curr Heart Fail Rep. 2018;15(5):251-260. doi:10.1007/s11897-018-0403-7
21. Ferreira JP, Rossignol P, Pocock SJ, et al. Meta-Analysis Global Group in Chronic Heart Failure (MAGGIC). Potential of Sacubitril/Valsartan to Prevent Heart Failure Readmissions: A Post Hoc Analysis of the PARADIGM-HF Trial. JACC Heart Fail. 2018;6(4):354-363. doi:10.1016/j.jchf.2018.01.005
22. Guo T, Fan Y, Chen M, et al. Cardiovascular implications of fatal outcomes of patients with coronavirus disease 2019 (COVID-19). JAMA Cardiol. 2020;5(7):811-818. doi:10.1001/jamacardio.2020.1017
23. Gavriatopoulou M, Korompoki E, Fotiou D, et al. Organ-specific manifestations of COVID-19 infection. Clin Exp Med. 2020;20(4):493-506. doi:10.1007/s10238-020-00645-7
24. Metkus TS, Sokoll LJ, Barth AS, Czarny MJ. What cardiologists need to know about COVID-19: a review. JACC Basic Transl Sci. 2020;5(5):519-531. doi:10.1016/j.jacbts.2020.04.001
25. Azevedo RB, Botelho BG, Hollanda JV, et al. Covid-19 and the cardiovascular system: a comprehensive review. J Hum Hypertens. 2021;35(1):4-11. doi:10.1038/s41371-020-00435-4
26. Shamsoddin E, Javanmard SH, Razmi T, et al. Coronavirus disease 2019 (COVID-19) and cardiovascular events: a comprehensive review. J Cardiovasc Thorac Res. 2021;13(1):1-10. doi:10.34172/jcvtr.2021.01
27. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395(10223):497-506. doi:10.1016/S0140-6736(20)30183-5
28. Akhmerov A, Marbán E. COVID-19 and the heart. Circ Res. 2020;126(10):1443-1455. doi:10.1161/CIRCRESAHA.120.317055
29. Clerkin KJ, Fried JA, Raikhelkar J, et al. COVID-19 and cardiovascular disease. Circulation. 2020;141(20):1648-1655. doi:10.1161/CIRCULATIONAHA.120.046941
30. Guzik TJ, Mohiddin SA, Dimarco A, et al. COVID-19 and the cardiovascular system: implications for risk assessment, diagnosis, and treatment options. Cardiovasc Res. 2020;116(10):1666-1687. doi:10.1093/cvr/cvaa106.