



THE ROLE OF RESPIRATORY REHABILITATION IN PATIENTS RECOVERING FROM THE COVID-19 INFECTION

P. Angelova*

Department of Physical Education and Sport, Trakia University, Stara Zagora, Bulgaria

ABSTRACT

A literature review revealed that there were no up-to-date reports of respiratory rehabilitation applied to the injury or physical dysfunction of patients with COVID-19 after discharge from the hospital. There is a need for studies examining exercise recovery and respiratory rehabilitation after treatment of patients with COVID-19. The rapid changes that are taking place regionally and globally require the adaptation of healthcare to ensure continuous and coordinated patient-centered healthcare. Pulmonary rehabilitation reduces symptoms, has social and health economic benefits for patients with chronic respiratory disease, and is still under-implemented. Consensus needs to be reached on the need for respiratory rehabilitation and efforts should be made to bring rehabilitation closer to patients' homes, where patients with milder symptoms can continue to exercise on their own. Tele-rehabilitation can also be used as an alternative for certain patients and conditions and may play an important role in people with COVID-19.

Key words: respiratory rehabilitation, COVID-19, exercises, health care

INTRODUCTION

At the beginning of 2020, the world faced an almost unmanageable disaster that shook many of the world's health systems and disrupted the sense of safety and security of millions of people. There are over 60 million cases of COVID-19 in the European region, according to data from the World Health Organization (WHO) for Europe from August 2, 2021. (1). The COVID-19 pandemic also proved to be a challenge for the Bulgarian healthcare system. According to official data of the Ministry of Health of Bulgaria for the period 8.03.2020, until 27.06.2021 the total number of registered cases is 421 515 (morbidity 6063.7 per 100,000) (2). The pandemic situation in the country has required

rapid and adequate action by health authorities to respond to rapidly changing conditions. The established National Operational Plan for dealing with the SARS-CoV-2 pandemic proposed urgent measures for the organization of inpatient and primary outpatient care and the adoption of a single protocol for diagnosis and treatment of COVID-19. The directors of the Regional Health Inspectorates were assigned to establish an organization of health activities related to COVID-19, to coordinate, control and interact with medical institutions. At the moment, the fourth wave is entering the battle with the virus and this is leading to a huge health, economic and social crisis.

MATERIAL AND METHODS

International approaches to behavior in coronavirus infection are already available. These approaches are based on peer-reviewed evidence from clinical trials and meta-analyses. Good practices and reliable scientific facts have been

*Correspondence to: *Petya Angelova, Department of Physical Education and Sport, Trakia University, Stara Zagora, Bulgaria, E-mail: pe_angelova@abv.bg, authors phone +359 886 441 285*

collected and summarized since the beginning of the pandemic. At present / VII.2021/, it is difficult to find numerous publications that certify the application of pulmonary rehabilitation after a coronavirus infection. The purpose of this paper is to provide the necessary information related to the application of pulmonary rehabilitation after a coronavirus infection.

RESULTS

One of the main areas of work of the WHO in Europe is focused on the recovery of the workforce after COVID-19. The European Work Program, 2020-2025 - "Joint Action for Better Health in Europe" (EPW) has identified three main priorities, one of which is to promote the health and well-being of citizens in the European region. The EPW documents emphasize the importance of this priority and the implementation efforts are focused on five workflows:

- Support for a local living environment that allows for health and well-being
- Promoting a safer, healthier and better life
- Improving patient safety and tackling antimicrobial resistance
- Development of strategic intelligence on levels and inequalities of health and well-being
- Review of the main approved programs in the WHO technical portfolio for Europe, assessment of their need to improve efficiency through innovation in terms of digitization, technology and organization (3).

The aforementioned project of the World Health Organization (RAHEE) notes that "Some of the main challenges facing public health systems in European Union (EU) countries are related to aging. population, epidemiological change and technological progress."

The share of the aging population is increasing, which is a challenge for the health systems in all countries. There are more and more people with many concomitant diseases, and chronic diseases are an additional burden. The existing models of health care provision should include new ones, such as the provision of health services through prevention and monitoring. These ways would ease public funding and balance some of the health care costs. The global financial crisis is

having a serious impact on the type, quality and scope of health services provided.

In addition, the provision of health services must meet the growing societal demands for affordable, quality and innovative health care.

In general, Covid-19 turned out to be very different from other similar viral infections. By now, it has become clear that the coronavirus infection has a variety of clinical manifestations and affects various organs and systems in the body. The course itself is strictly individual, and the recovery process is sometimes too slow. Permanent damage to certain organs and systems is often observed, which is a test for people in terms of their life and professional responsibilities. In some patients, there are permanent changes in the lungs, where the virus-damaged cells are replaced by fibrous ones, which leads to impaired respiratory function. This process of pneumofibrosis and its growth to larger sizes leads to lasting negative consequences for the whole organism. On the other hand, the intoxication of the body leads to general muscle weakness long after the illness. The central nervous system, cardiovascular and gastrointestinal systems are also affected (4).

The treatment at home of patients with mild forms is organized so as to provide an opportunity for observation, dynamic assessment of the condition, and in case of worsening of the symptoms, hospitalization. The countries with developed healthcare have developed systematized therapeutic approaches, gained extensive experience and prepared for a possible next wave of COVID-19. The rapidly changing dynamics in the conditions of a global COVID-19 pandemic urgently require a rethinking of the provision of health services in Bulgaria, in accordance with the local conditions, resources and needs. The rehabilitation after COVID-19 is free for patients and is covered by the National Health Insurance Fund. However, the duration of the therapeutic course is not more than 10 days. In most cases, it turns out that the goal of inpatient rehabilitation is to train the patient in proper breathing and for him to continue at home, because the rehabilitation after COVID-19 is a long process for most patients. The pulmonary rehabilitation reduces symptoms, has social and

health economic benefits for patients with chronic respiratory disease, and yet is not widely used. There is a gap between the practice and the benefits of respiratory rehabilitation due to insufficient health funding, lack of qualified medical professionals, poor patient information and all other barriers (5). In a systematic review, Goodwin VA, Allan L, Bethel A, et al. summarize that exercise and early mobilization may contribute to post-admission in the intensive care unit in patients with COVID-19 (6). Pulmonary rehabilitation is an important part of disease management during the recovery period, and if administered effectively would lead to long-term benefits for the patient. (7). Tele-rehabilitation can also be used as an alternative for certain patients and conditions and can take its place in the recovery period after coronavirus infection (8). From the research it is clear that there is a need to introduce tele-rehabilitation in the Bulgarian medical practice in the new post-COVID era (9). Data on the clinical efficacy of tele-rehabilitation in a number of respiratory, cardiac and other diseases are already available (10, 11). There is published evidence of the health benefits of a standardized rehabilitation program at home (12). Since exercise is a major component of the pulmonary rehabilitation, it is sometimes difficult to establish a clear plan for how it should be administered to patients after Covid-19. Despite the progress of Rehabilitation Medicine and its contribution to improving the health of people, a weakness is observed. At the root of this problem is the lack of a clear program and treatment plan. There is often a difference in the programs such as content, means, methods, duration of application, dosage. Sometimes there is a lack of clear guidance as to which patients should receive rehabilitation procedures, especially when it comes to respiratory rehabilitation. Because exercise is a major component of the pulmonary rehabilitation, it is sometimes difficult to establish a clear plan for how it should be administered to patients after Covid-19. "Exercise is medicine" and as such, it is necessary to prescribe it correctly (13). The therapeutic impact of the pulmonary rehabilitation program can be significantly increased if there is a clearly individualized plan for each separate patient. All that has been said so far indicates that experienced specialists and a

proper understanding of the physiological limitations of each individual patient are required in order for the recovery period to proceed favorably.

CONCLUSION

The rehabilitation procedures are extremely beneficial for people, however, provided that an individual approach is followed. Further studies are needed on the method and means of administering the respiratory rehabilitation after treatment with COVID-19, including after intensive treatment.

Consensus needs to be reached on the need for respiratory rehabilitation and efforts should be made to bring the rehabilitation closer to the patients' homes, especially in patients with milder symptoms.

The pulmonary rehabilitation during the recovery period is a major challenge for the medical staff, the resolution of which requires multidisciplinary cooperation and high professionalism and support.

REFERENCES

1. https://www.euro.who.int/en/media-centre/sections/press-releases/2021/covid-19-cases-top-60-million-in-european-region,-says-who/europe?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+who%2Feuro%2Frss%2Fen+%28WHO%2FEurope+%7C+News+feed%29
2. <https://www.mh.government.bg/bg/novini/aktualno/nacionalen-plan-za-spravyane-s-pandemiyata-ot-sars/>
3. <https://www.euro.who.int/en/about-us/organization/office-locations/who-representation-at-the-european-union-brussels-belgium/research-agenda-for-health-economic-evaluation-rahee-project>
4. Bansal, M., Cardiovascular disease and COVID-19. *Diabetes and metabolic syndrome*, 14: 247 - 250 . doi: 10.1016/j.dsx.2020.03.013., 2020
5. Spruit, MA., Singh, SJ, Garvey, C., ZuWallack, R., Nici, L., Rochester, C., Hill, K., Holland, AE., Lareau, SC., Man, WD, et al.; ATS/ERS Task Force on Pulmonary Rehabilitation. An official American Thoracic Society/European

- Respiratory Society statement: key concepts and advances in pulmonary rehabilitation. *Am. J. Respir. Crit. Care Med.*; 188: e13–64., 2013
6. Goodwin, VA., Allan, L., Bethel, A., et al., Rehabilitation to enable recovery from COVID-19: a rapid systematic review. *Physiotherapy*; 111:4-22. doi:10.1016/j.physio.2021.01.007, 2021
 7. Yang, L., Yang, T., Pulmonary rehabilitation for patients with coronavirus disease 2019 (COVID-19), *Chronic Diseases and Translational Medicine*, Volume 6, Issue 2, Pages 79-86, ISSN 2095-882X, <https://doi.org/10.1016/j.cdtm.2020.05.002>., 2020
 8. Donner, CF., Raskin, J., ZuWallack, R., Nici, L., Ambrosino, N., Balbi, B., Blackstock, F., Casaburi R, Dreher M, Effing T et al., Incorporating telemedicine into the integrated care of the COPD patient a summary of an interdisciplinary workshop held in Stresa, Italy, 7-8 September. *Respir. Med.* 2018; 143: 91–102., 2017
 9. Dzhafer N, Papathanasiou J. Telerehabilitation and COVID-19. Time for reorganization of rehabilitation services in Bulgaria? *Inspiro (Sofia)*., 60(2):9-12., 2021
 10. Taito S, Yamauchi K, Kataoka Y. Telerehabilitation in Subjects With Respiratory Disease: A Scoping Review. *Respir Care*; 66(4):686-698. doi: 10.4187/respcare.08365. 8., 2021
 11. Scherrenberg M, Wilhelm M, Hansen D, et al. The future is now: a call for action for cardiac telerehabilitation in the COVID-19 pandemic from the secondary prevention and rehabilitation section of the European Association of Preventive Cardiology. *Eur J Prev Cardiol* Jul 3:2047487320939671. doi: 10.1177/2047487320939671., 2020
 12. Horton, EJ., Mitchell, KE., Johnson-Warrington, V., Apps, LD., Sewell, L., Morgan, M., Taylor, RS., Singh, SJ., Comparison of a structured home-based rehabilitation programme with conventional supervised pulmonary rehabilitation: a randomised non-inferiority trial. *Thorax*; 73: 29–36, 2018
 13. Blair, SN., Sallis, RE., Hutber, A., Archer, E., Exercise therapy - the public health message. *Scand J Med Sci Sports*. 2012 Aug;22(4):e24-8. doi: 10.1111/j.1600-0838.2012.01462.x. Epub Mar 19. PMID: 22429265., 2012