ISSN 2515-8260 Volume 08, Issue 01, 2021

CLINICAL REHABILITATION OF PATIENTS WITH CEREBRAL STROKE CAUSED BY A STROKE WITH COVID-19

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Abstract: Various possible and non-mutually exclusive mechanisms may play a role in the development of ischemic stroke in patients with COVID-19. Long duration of mechanical ventilation (ALV) makes patients with COVID-19 who require invasive respiratory support more vulnerable to complications associated with the development of critical illness, including the risk of hypotension and inadequate cerebral perfusion; risk of relative hypertension leading to posterior reversible encephalopathy syndrome; the possibility of septic embolism in the event of a bacterial infection; the possibility of cardiomyopathy and a concomitant decrease in the left ventricular ejection fraction.
Keywords. COVID-19 pandemic, SARS-CoV-2, rehabilitation, recommendations.

Introduction. In addition, severe COVID-19 has been associated with a hyperinflammatory condition ("cytokine storm") [16]. COVID-19 increases levels of pro-inflammatory molecules, including interleukin (IL) -1 and -6 [1]. The systemic inflammatory response can also lead to rupture or erosion of atherosclerotic plaque and destabilization of previously asymptomatic cardiovascular conditions such as myocardial infarction (MI), heart failure, and myocarditis [15, 17].

Moreover, patients with COVID-19 may develop more severe coagulopathy, defined as "coagulopathy associated with COVID-19," which is induced by an acute systemic inflammatory response, presumably mediated by an infectious agent or its products. SARS-CoV-2 can lead to severe inflammation, including an inflammatory "cytokine storm," which in turn leads to "COVID-19-associated coagulopathy" or thrombosis [13].

Acute disorders of cerebral circulation are the most important medical and social problem. There are more than 1 million people with ischemic stroke in Uzbekistan, and more than 80% of them have disabilities. The mortality rate of ischemic stroke, in the acute stage, is 35% [10]. Cognitive impairments of varying severity are detected in 40 - 70% of patients with ischemic stroke. The prevalence of dementia in the first 3-6 months after a stroke ranges from 5 to 32%, and 12 months later - from 8 to 26% [9].

Endocrinopathies are one of the significant risk factors for cerebrovascular diseases. The number of such patients is increasing in all economically developed countries of the world. Diabetes mellitus is the most common endocrine disease associated with cerebrovascular accident. According to the results of statistical studies in recent years, more than 10% of patients with type 2 diabetes mellitus die due to cerebral circulation disorders [Kalinin A.P., 2019].

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Cognitive impairments in patients with ischemic stroke and type 2 diabetes mellitus differ in a number of features, however, studies on this issue are few and contradictory.

At the end of 2019, an outbreak of a new coronavirus infection occurred in the People's Republic of China (PRC) with an epicenter in the city of Wuhan (Hubei province), the causative agent of which was given the temporary name 2019-nCoV. On February 11, 2020, the World Health Organization (WHO) assigned the official name of the infection caused by the new coronavirus - COVID-19 ("Coronavirus disease 2019"). On February 11, 2020, the International Committee on Virus Taxonomy gave the official name to the infectious agent - SARS-CoV-2. The COVID19 pandemic was declared by WHO on 9 March 2020.

Taking into account the development of the epidemic process in the world, health professionals were assigned tasks related to the rapid diagnosis and provision of medical care to patients. Along with the methodological recommendations aimed at the prevention, diagnosis and treatment of new coronavirus infection in the general population scale, it became necessary to focus on certain categories of patients at special risk groups. WHO has identified the leading non-communicable diseases that increase the likelihood of infection with COVID-19: cardiovascular and chronic respiratory diseases, diabetes mellitus (DM) and oncology. These patients are not only at high risk of infection. The course of COVID19 in this category of patients is complicated by the decompensation of chronic diseases, the progression of complications, atypical manifestations of the infectious process, which are additional risk factors for premature death. It is also necessary to take into account drug interactions in comorbid patients and the effect of the discussed specific therapy on the course of chronic diseases.

Patients with novel coronavirus infection (COVID-19) may need rehabilitation. The conditions of the epidemic caused by SARS-CoV-2 require a revision of approaches to the rehabilitation of patients with other pathologies. It is necessary to develop clinical guidelines for the provision of rehabilitation assistance to patients with COVID-19 and other diseases during a pandemic. The expert group analyzed data from current reviews on rehabilitation for COVID-19, as well as previously conducted research on rehabilitation for intensive care syndrome and acute respiratory distress syndrome of a non-coronavirus nature, based on which the main positions for clinical guidelines were developed. The article discusses the main rehabilitation problems in patients with COVID-19, in particular, structural and functional disorders leading to restrictions on self-care, mobility, everyday life, communication, interpersonal relationships, professional activities and determining the need for care.(4) General recommendations are given for organizing medical rehabilitation in a pandemic at all three stages, including the issues of patient routing and ensuring the infectious safety of medical personnel and patients. The necessary components of an individual rehabilitation program for patients with COVID-19 at all stages of rehabilitation, including examination of patients, correction of nutritional deficiency, restoration of respiratory function, exercise tolerance, muscle strength, self-control and training in new conditions of movement, as well as restoration of disorders of the psycho-emotional state and cognitive functions, independence in daily life. Medical rehabilitation during the COVID-19 epidemic should include all components of rehabilitation assistance and help optimize vital functions, prevent complications and improve the quality of life of patients.

At the moment, there is a situation in the world in which reliable professional information on the provision of medical care, especially rehabilitation, to patients with COVID-19 (CoronaVIrus Disease - a coronavirus disease that arose in 2019) is not enough, since this disease is new. The traditional method of obtaining the necessary information by drawing on

ISSN 2515-8260 Volume 08, Issue 01, 2021

data from previously performed scientific studies has proved ineffective, since the experience of treating patients with a new coronavirus infection is measured in only a few months. Given the unusual situation of the pandemic itself and the peculiarities of the pathogenesis of the disease caused by SARS-CoV-2 (Severe Acute Respiratory Syndrome-related COronaVirus 2, severe acute respiratory syndrome associated with coronavirus 2), the routine use of generally accepted developments may be unsafe or ineffective. Reports from organizations and clinics that are currently providing assistance for patients with COVID-19 and already have initial experience in providing rehabilitation assistance to these patients come to the fore in the development of recommendations. A timely revision of the recommendations is required, and a huge responsibility in this work falls on the professional associations of rehabilitation therapists [1].

This review is based on reports from clinics currently involved in the rehabilitation of patients with COVID-19, as well as on the results of previous clinical studies on the rehabilitation of patients with intensive care after-effects syndrome and acute respiratory distress syndrome in adults of non-coronavirus etiology. A syndromic approach to the use of means and methods of physical and rehabilitation medicine is also considered.

The spectrum of rehabilitation problems in patients with the new coronavirus infection COVID-19

Significant demand for COVID-19 care and rehabilitation is projected to follow a surge in hospitalizations for COVID-19 patients. Professor D. Grabowski in his publication compares difficult patients

with COVID-19 with septic patients and suggests that up to 30% of hospitalized patients will need care on the basis of a medical institution and up to 20% - in medical support at home [2].

Data from China suggests that 6% of patients in general and 71% of patients with severe COVID-19 required mechanical ventilation (ALV). The average length of hospital stay was 12 days, but patients with severe disease were in intensive care units for 2-4 weeks [3, 14]. They had complications in the form of acute respiratory distress syndrome,

syndrome of the consequences of intensive care, pneumothorax, acute damage to the kidneys, heart, liver, nutritional deficiency, decreased physical tolerance, respiratory failure (dyspnea, breathing, decreased oxygen saturation) [4, 5]. In addition to the already known and generally recognized symptoms, other clinical manifestations and complications developed that required rehabilitation [5-11], in particular:

- syndrome of posterior reversible encephalopathy;
- polyneuromyopathy and polyneuropathy of critical conditions (after acute respiratory distress syndrome in adults and syndrome of the consequences of intensive care);
- myopathy;
- contractures of the ankle joints;
- bedsores;
- hyposmia, hypogeusia;
- ataxia;
- violation of consciousness;
- epileptic syndrome;
- development of acute disorders of cerebral circulation (ACVA) due to hypercoagulability syndrome.

ISSN 2515-8260 Volume 08, Issue 01, 2021

Coronaviruses belong to the family of RNA viruses that cause infectious disease in some animals and humans. As noted by V.V. Nikiforov et al. (2020), currently 4 types of coronaviruses (HCoV-229E, -OC43, -NL63, -HKU1) circulate among the population all year round [2]. They cause damage to the upper respiratory tract of varying severity. As a rule, diseases caused by the coronavirus family are mild, without severe symptoms [2]. According to the International Committee on Taxonomy of Viruses, the coronavirus family includes 40 types of RNA viruses and is divided into two subfamilies [5]. A complete viral particle has a size of 80-220 nm [2,5]. Various studies show that the envelope of the coronavirus consists of a lipid membrane, glycoprotein projections (peplomer), membrane glycoprotein, small envelope glycoprotein, and hemagglutinin esterase [5]. Large spiny processes, i.e. peplomeres of the virus in the form of a club, resembling a crown [2]. The persistence of the coronavirus in the environment is variable. Thus, in aerosols the virus is stable for three hours, on plastic surfaces - up to three days and on cardboard - 24 hours. There is evidence that under certain conditions (moderate ambient temperature) the virus is stable up to 17 days [7], and remains on the outer surface of the mask for more than seven days. According to other sources, the SARS-CoV-2 virus has low resistance in the external environment [2]. Thus, the virus dies under the influence of disinfectants, heating to 40 ° C for 1 hour and up to 56 ° C in 30 minutes [2].

Pathogenesis. The main routes of transmission of coronavirus are airborne droplets, airborne dust and contact. The fecal-oral route of transmission of the virus is not excluded. Transmission from diseased individuals or asymptomatic carriers of the virus is also possible [7, 12]. The spines of the coronavirus are associated with a specific mechanism of its penetration through the cell membrane by imitating the molecules to which the transmembrane receptors of the cells respond [2]. Researchers report that the SARSCoV-2 coronavirus is believed to be a recombinant virus between the bat coronavirus and another, unknown in origin, coronavirus [2, 17]. Susceptibility to the virus is high in all population groups. However, the risk groups for a severe course of coronavirus infection and the risk of lethal outcome of the disease include persons over 60 years of age, as well as patients with comorbid pathologies. The pathogenesis of SARS-CoV-2 is being actively studied [5]. It is believed that the main target cells for coronaviruses are cells of the alveolar epithelium [2].

The European Stroke Organization (ESO) recently issued a press release warning of a possible increased risk of death or disability from stroke during the COVID-192 pandemic. This press release concluded that the lack of optimal care is likely to lead to a greater risk of death and a lower likelihood of full recovery. ESO also noted that stroke patients should continue to be admitted to hospital as soon as possible and that efforts should be made to maintain routine levels of stroke management, including intravenous and endovascular reperfusion strategies, regardless of the patient's COVID-19 status, to avoid unnecessary “Collateral damage” due to inadequate treatment of this often disabling or life-threatening condition. The American Heart Association and the American Stroke Association (AHA / ASA) have provided interim guidance for stroke centers during the current crisis.

Conclusion. Thus, the COVID-19 pandemic has put a huge strain on health systems. Patients with severe COVID-19 symptoms may also have acute cerebrovascular accidents. IS in these patients may result from complications associated with COVID-19, or decompensation of previously asymptomatic cerebrovascular disorders, or due to the presence of common risk factors for stroke in COVID-19. The COVID-19 pandemic has had a huge impact on the

management of neurological patients, whether they are infected or not, and has negatively impacted most stroke services around the world. Various studies discuss that the lack of optimal care is likely to lead to a greater risk of death and an increase in the number of disabled people after stroke.

References

1. Grabowski DC, Joynt Maddox KE. Postacute care preparedness for COVID-19: thinking ahead. *JAMA*. 2020. doi: 10.1001/jama.2020.4686.
2. Levy J, Leotard A, Lawrence C, et al. A model for a ventilator-weaning and early rehabilitation unit to deal with post-ICU impairments with severe COVID-19. *Ann Phys Rehabil Med.* 2020;S1877-0657(20)30077-4. doi: 10.1016/ j.rehab.2020.04.002.
3. Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med.* 2020;8(5):475-481. doi: 10.1016/S2213-2600(20)30079-5.
4. Levine DM, Ouchi K, Blanchfield B, et al. Hospital-level care at home for acutely ill adults: a randomized controlled trial. *Ann Intern Med.* 2020;172(2):77-85. doi: 10.7326/ M19-0600.
5. McNeary L, Maltser S, Verduzco-Gutierrez M. Navigating Coronavirus disease 2019 (Covid-19) in physiatry: a can report for inpatient rehabilitation facilities. *PM R.* 2020; 12(5):512—515. doi: 10.1002/pmrj.12369.
6. Brugliera L, Spina A, Castellazzi P, et al. Rehabilitation of COVID-19 patients. *J Rehabil Med.* 2020;52(4):jrm00046. doi: 10.2340/16501977-2678.
7. Fan E. Critical illness neuromyopathy and the role of physical therapy and rehabilitation in critically ill patients. *Respir Care.* 2012;57(6):933-944. doi: 10.4187/ respcare.01634.
8. Xiang YT, Zhao YJ, Liu ZH, et al. The COVID-19 outbreak and psychiatric hospitals in China: managing challenges through mental health service reform. *Int J Biol Sci.* 2020;16(10):1741-1744. doi: 10.7150/ijbs.45072.
9. Ahmed MZ, Ahmed O, Aibao Z, et al. Epidemic of COVID-19 in China and associated psychological problems. *Asian J Psychiatr.* 2020;51:102092. doi: 10.1016/ j.ajp.2020.102092.
10. Brodsky MB, Huang M, Shanholtz C, et al. Recovery from dysphagia symptoms after oral endotracheal intubation in acute respiratory distress syndrome survivors. A 5-year longitudinal study. *Ann Am Thorac Soc.* 2017;14(3): 376-383. doi: 10.1513/AnnalsATS.201606-455OC.
11. Carda S, Invernizzi M, Bavikatte G, et al. The role of physical and rehabilitation medicine in the COVID-19 pandemic: the clinician's view. *Ann Phys Rehabil Med.* 2020; S1877-0657(20)30076-2. doi: 10.1016/j.rehab.2020.04.001.
12. Hui DS, Wong KT, Ko FW, et al. The 1-year impact of severe acute respiratory syndrome on pulmonary function, exercise capacity, and quality of life in a cohort of survivors. *Chest.* 2005;128(4):2247-2261. doi: 10.1378/ chest.128.4.2247.
13. Baig AM, Khaleeq A, Ali U, Syeda H. Evidence of the COVID-19 virus targeting the cns: tissue distribution, hostvirus interaction, and proposed neurotropic mechanisms. *ACS Chem Neurosci*. 2020;11(7):995-998. doi: 10.1021/ acschemneuro.0c00122.
14. Herridge MS, Moss M, Hough CL, et al. Recovery and outcomes after the acute

respiratory distress syndrome (ARDS) in patients and their family caregivers. *Intensive Care Med.* 2016;42(5):725-738. doi: 10.1007/s00134-0164321-8.

15. Green M, Marzano V, Leditschke IA, et al. Mobilization of intensive care patients: a multidisciplinary practical guide for clinicians. *J Multidiscip Healthc.* 2016;9:247-256. doi: 10.2147/JMDH.S99811.
16. Hodgson CL, Stiller K, Needham DM, et al. Expert consensus and recommendations on safety criteria for active mobilization of mechanically ventilated critically ill adults. *Crit Care.* 2014;18(6):658. doi: 10.1186/s13054-014-0658-y.
17. Vitacca M, Carone M, Clini E, et al. Joint statement on the role of respiratory rehabilitation in the COVID-19 crisis: the Italian position paper. *Respiration.* 2020;1-7. doi: 10.1159/000508399.