academic publishers

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE (ISSN: 2692-5206)

Volume 04, Issue 09, 2024

Published Date: 25-11-2024

EARLY AND LATE COMPLICATIONS OF COVID-19

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Abstract: The article analyzes early and late complications of COVID-19 infection, including lung damage, post-COVID syndrome, and cardiovascular problems. Ways to diagnose, treat, and prevent complications, as well as the importance of rehabilitation and vaccination, are shown.

Key words:COVID-19, early complications, late complications, post-COVID syndrome, rehabilitation, respiratory system, cardiovascular system, vaccination, psychological problems, healthy lifestyle.

Introduction

The COVID-19 pandemic has emerged as a global challenge for modern medicine and healthcare systems. This virus infection affects the lives of millions of people not only as one of the acute diseases of people, but also with its long-term complications. During the pandemic, many studies were conducted on the clinical manifestations and consequences of the disease. These studies are aimed at determining the negative effects of the infection of COVID-19 on various systems of the body, in particular, on the respiratory, cardiovascular, immune and nervous systems. At the same time, the sharp increase in mood and psychological problems, especially the long-term consequences – problems related to the post-COVID syndrome – have become one of the main topics of scientific and medical discussion. Early and late complications of COVID-19 infection are important not only for the health of individual patients, but also for the stability of the health care system and socio-economic development. Early complications such as respiratory failure, thrombosis, neurological disorders, and immunosuppression occur during the course of the disease and often increase the risk of death. Long-term late complications cause a decrease in rehabilitation, social adaptation and quality of life.

This article discusses early and late complications of COVID-19 infection, their causes, treatment and rehabilitation methods, and preventive measures. The article contains scientific and practical recommendations aimed at effective management of the consequences of the pandemic and strengthening of the health care system. This topic is important for alleviating the negative effects of the global pandemic.

Materials and methods

Clinical, laboratory and instrumental examinations of patients were analyzed in the study aimed at studying early and late complications of COVID-19 infection. The purpose of this study was to assess the short-term and long-term effects of the disease on the body, to identify complications and develop effective recommendations for their elimination.

More than 200 patients with COVID-19 were included in the study during 2022–2023. 120 of them had complications that occurred during the acute period of the disease, and their condition was observed during the period of the disease and in the process of recovery. 80 patients were included among those suffering from post-COVID syndrome, i.e. those suffering from long-term late complications. Patients were divided into groups according to age, sex and main disease conditions, and the specific characteristics of complications observed in each group were studied.

The following methods were used in the research:

Clinical examinations: The patients' anamnesis data were collected, the main symptoms (breathing difficulties, heart rate acceleration, fatigue, headache, muscle and joint pain) were recorded. The cases observed during the acute period of the disease and the problems that arose during recovery were analyzed.

Laboratory analyses: An analysis of the main blood parameters was carried out, inflammatory markers (CRP, ferritin, D-dimer) were determined. The level of lymphocytes and cytokines was measured in order to evaluate the activity of the immune system. These indicators were used to determine the risk factors associated with the development of complications in patients.

Instrumental diagnostics: X-ray and computed tomography were used to determine lung damage. Electrocardiography (ECG) and echocardiography (ECHO) were performed to assess the state of the cardiovascular system. These methods made it possible to identify serious complications such as pulmonary fibrosis, thrombosis and myocarditis.

Psychological assessment: Special questionnaires and tests were used to assess the psychological condition of patients participating in the study. Internationally validated tools such as DASS-21 and Beck Depression Scale were used to measure levels of stress, anxiety and depression.

Analysis of rehabilitation measures: The effectiveness of the rehabilitation process through breathing exercises, physiotherapy, diet and special training was studied. Also, the effect of psychological counseling and support programs on the quality of life of patients was evaluated.

Data processing and statistical analysis: The collected data were processed in special statistical programs and the relationship between the demographic and clinical parameters of the patients was analyzed. Using regression analysis, the risk of developing complications and the factors causing them were determined.

The main focus of the research was on studying the systemic effects of COVID-19, identifying risk factors for complications, and developing practical recommendations for diagnosis and rehabilitation. These methods are effective in reducing complications and speeding up the recovery of patients, and can be applied to the practice of the health system.

Results and discussion

The main goal of the study was to analyze the early and late complications of COVID-19 infection, to determine their effects on the body, and to study the long-term consequences of the recovery process. The results of the research are presented in the following main areas:

Early Complications: Complications during the acute phase of COVID-19 were the main focus of the study. Among the 120 patients, the most common complications were:

Respiratory complications: Inflammation of the lungs (pneumonia), pulmonary fibrosis, and airway damage (weakness of muscles and respiratory muscles) were the most common. According to the results of radiography and computer tomography, 68% of patients developed complications related to lung damage.

Cardiovascular system complications: Heart palpitations, thrombosis in blood vessels and myocarditis have been observed. ECG and echocardiography revealed heart problems (in 39% of patients).

Elevated levels of immune system and inflammatory markers: increased CRP, ferritin and D-dimer levels indicated ongoing inflammatory processes in patients. Immune dysfunction was observed in many patients and this led to the development of long-term complications.

Late Complications (Post-Covid Syndrome): The study also looked at long-term complications (post-Covid syndrome) that occur after infection with COVID-19. More than 80% of patients suffered from the following conditions after recovery:

Fatigue and lack of energy: 72% of patients complained of prolonged fatigue and weakness in the post-COVID period. This condition was found more often in patients who experienced severe disease.

Psychological complications: Psychological problems such as stress, anxiety, depression and sleep disorders were present among 60% of patients. Analyzes of DASS-21 and Beck depression scale showed that the psychological state significantly worsened in the post-disease period.

Cognitive features: Problems with mental functioning and memory were observed, especially in 50% of patients. Impairment of cognitive functions, the phenomenon of "brain fog", has been observed in the wake of COVID-19, and patients often have difficulty concentrating.

Rehabilitation and treatment methods: The effectiveness of the rehabilitation measures carried out

during the study was also evaluated. Breathing exercises, physiotherapy, psychological support and special training were recommended to the patients. The following results were obtained:

Breathing exercises and physiotherapy: These methods significantly improved the respiratory condition of the patients. Strengthening of the respiratory muscles and opening of the airways reduced the complications of the respiratory system. 75% of patients reported improvement with breathing exercises and physical therapy.

Psychological support: Psychological counseling and stress management techniques have been particularly effective in reducing depression and anxiety. 60% of patients reported an improvement in their emotional state after psychological support.

Diet and Immune Enhancement: Special diet and vitamins have been recommended to support the recovery of the immune system. This measure was important in restoring the health of patients.

Discussion:

Early and late complications of COVID-19 have a significant impact on patients' long-term health. The results of the study showed that patients face a large number of complications not only during the acute period of the disease, but also after recovery. Pulmonary and cardiovascular system complications are dominant in the acute period, while psychological and cognitive problems are more common in the post-COVID period. And the effectiveness of rehabilitation methods accelerates the healing process of patients and helps to reduce complications.

The study also highlights the need for an individualized approach and comprehensive treatment and rehabilitation measures for patients with COVID-19. Further research should be focused on the long-term effects of post-COVID syndrome. Special attention should be paid to improving the effectiveness of psychological and physical rehabilitation methods.

Conclusion

In conclusion, this study examined the early and late complications of COVID-19 infection and determined the effects of the disease on the body and its long-term consequences. The results of the study showed that during the acute period of COVID-19, conditions such as pulmonary and cardiovascular system complications, high levels of inflammatory markers are common, and after recovery, the post-COVID syndrome, that is, psychological and cognitive problems, fatigue and lack of energy negatively affected the quality of life of patients. Rehabilitation measures, including breathing exercises, physical therapy, psychological support, and special diets, have been effective in speeding up patients' recovery and reducing complications. The results of the study showed that individualized treatment of patients after COVID-19, including physical and psychological rehabilitation, is important for long-term health recovery. At the same time, there is a need to further study the long-term effects of COVID-19. In the future, more research is needed to better understand the effects of post-COVID syndrome and to develop effective treatments. This will help the healthcare system develop new approaches to managing complications and improving patients' quality of life.

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