MANAGEMENT OF COVID-19 AND POST-COVID COMPLICATIONS

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Abstract: The COVID-19 pandemic continues to pose significant long-term health challenges due to post-acute sequelae of SARS-CoV-2 infection, commonly known as Long COVID or post-COVID condition. This review provides a comprehensive overview of the current evidence on the management of acute COVID-19 and its post-acute complications. It summarizes the pathophysiology, clinical manifestations across multiple organ systems, risk factors, diagnostic approaches, and evidence-based management strategies. A multidisciplinary, individualized approach combining rehabilitation, psychological support, and symptomatic treatment remains the cornerstone of care. Early vaccination, optimal acute-phase management, and timely rehabilitation are key to reducing the burden of Long COVID. Despite growing research, high-quality evidence for many therapeutic interventions is still limited, highlighting the need for continued research and specialized care pathways

Key words:COVID-19, Long COVID, post-COVID syndrome, post-acute sequelae of SARS-CoV-2 (PASC), multidisciplinary management, rehabilitation, chronic fatigue, pulmonary complications, cardiovascular complications

Introduction

The COVID-19 pandemic has left a significant legacy in the form of post-acute sequelae of SARS-CoV-2 infection (PASC), commonly known as Long COVID or post-COVID condition. According to the World Health Organization (WHO), this condition is defined as symptoms that appear or persist three months after the initial SARS-CoV-2 infection, last for at least two months, and cannot be explained by an alternative diagnosis. It affects approximately 10–30% of all infected individuals, with higher rates (up to 50–70%) among those who had severe acute illness. Long COVID is a multisystem disorder that significantly impacts quality of life, productivity, and healthcare systems worldwide.

Pathophysiology and Risk Factors

The main proposed mechanisms include:

Persistent viral reservoirs or viral RNA fragments

Immune dysregulation and chronic low-grade inflammation

Micro vascular endothelial damage and thrombosis

Autoantibody production

Mitochondrial dysfunction and tissue fibrosis

Key risk factors include female sex, older age, obesity, diabetes, pre-existing cardiovascular or respiratory disease, and hospitalization during the acute phase.

Clinical Manifestations (System-wise)

Respiratory: Dyspnea, chronic cough, reduced exercise tolerance, interstitial lung disease, fibrosis, and organizing pneumonia.

Cardiovascular: Myocarditis, arrhythmias, postural orthostatic tachycardia syndrome (POTS), pericarditis, and increased risk of thromboembolism.

Neurological & Cognitive: Brain fog, headache, memory impairment, concentration difficulties, anosmia/dysgeusia, sleep disturbances, anxiety, and depression.

Musculoskeletal: Chronic fatigue (most common symptom), myalgia, arthralgia, and post-exertional malaise (PEM).

Other systems: Gastrointestinal disturbances, renal impairment, endocrine disorders (new-onset diabetes), and skin manifestations

Management Strategies

1. Acute COVID-19 Phase (Prevention of Long COVID)

Vaccination and booster doses remain the most effective preventive measure.

Early use of antivirals (e.g., nirmatrelvir/ritonavir – Paxlovid) in high-risk patients.

Appropriate use of corticosteroids (dexamethasone) and other immunomodulators in severe cases.

2. Diagnosis of Post-COVID Condition

Detailed history and symptom timeline (onset ≥4–12 weeks after infection).

Laboratory tests: CBC, CRP, D-dimer, troponin, NT-proBNP, ferritin, etc.

Investigations: Chest CT, pulmonary function tests (PFT), 6-minute walk test, ECG, echocardiography, Holter monitoring, and brain MRI when indicated.

3. Treatment and Rehabilitation

Multidisciplinary approach is the cornerstone: involving pulmonologists, cardiologists, neurologists, physiotherapists, psychologists, and rehabilitation specialists.

Graded rehabilitation and pacing: Individualized physical activity programs. Avoid overexertion in patients with post-exertional malaise.

Cognitive Behavioral Therapy (CBT) and psychological support: Shown to be effective for fatigue, anxiety, and cognitive symptoms.

Symptomatic management: Beta-blockers or ivabradine for POTS, analgesics, low-dose antidepressants, anticoagulants (when indicated), and breathing exercises.

Emerging therapies: Ongoing research on anti-inflammatory agents, mitochondrial support, and hyperbaric oxygen, but high-quality evidence is still limited.

4. Monitoring and Follow-up

Regular follow-up in the first 3–6 months.

Personalized rehabilitation plan with clear goals.

Gradual return-to-work or return-to-school programs.

Prognosis and Prevention

Most patients show gradual improvement over 6–24 months, but a subset experiences persistent symptoms. Early intervention, vaccination, and optimal acute-phase management are the best preventive strategies. Ongoing research is focused on identifying biomarkers and targeted therapies.

Conclusion

Post-COVID syndrome is a complex, multisystem condition that requires individualized, evidence-based, and multidisciplinary care. While no single cure exists, a combination of rehabilitation, psychological support, and symptom-directed treatment significantly improves outcomes. Continued research and specialized Long COVID clinics are essential for better management in the coming years.

Important Note: This article is for educational purposes only and is not a substitute for professional medical advice. Patients should consult qualified healthcare providers for diagnosis and treatment.

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