COVID-19 & Rheumatic Disease: Are We in It for the Long Haul?

Transcript

**Swati Deshmukh, MD (Guest):** In some patients with COVID-19, the rheumatologic condition is a new diagnosis and can occur in people with or without a family history of rheumatologic disease. In other patients, the virus causes a flare, or exacerbation of symptoms, of a known underlying rheumatologic condition.

**Meghna Rao (Host):** Welcome to Rheum Advisor on Air, the official podcast of *Rheumatology Advisor*, one of Haymarket Media’s leading publications that focuses on the latest news and research in rheumatology to inform clinical practices.

I'm your host, Meghna Rao, the editor of *Rheumatology Advisor*. In this podcast series, we will be looking at emerging topics in the field of rheumatology from various experts. These perspectives may be related to the diagnosis and treatment of rheumatic diseases, current guidelines, practice management, patient care, and much, much more.

So let's dive in!

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Welcome to yet another episode of the *Rheumatology Advisor* podcast. Today is a very special episode as it is being hosted by 2 of my wonderful colleagues, Samiha Tamboo, a second-year pharmacy student and PharmD candidate for 2024, and Tylar Stanley, a fourth-year microbiology student, with a minor in journalism.

With that, I’m going to turn over to you, Samiha and Tylar.

**Tylar Stanley (Host):** Thank you, Meghna. We’re excited to be here.

In our conversation today, we will be focusing on “long COVID,” also known as postacute COVID syndrome, and its effect on patients with rheumatic diseases.

According to multiple studies and surveys, 50% to 80% of patients continue to have lingering symptoms 3 months after the onset of COVID-19. Now, musculoskeletal symptoms are becoming common lasting symptoms among “COVID-19 long haulers.”

**Samiha Tamboo (Host):** Tylar, thank you! I want to introduce our guest today. Today’s guest is Swati Deshmukh MD, musculoskeletal radiologist at Beth Israel Deaconess Medical Center, and assistant Professor of radiology at Harvard Medical School.
Dr Deshmukh, welcome to Rheum Advisor on Air, and thank you so much for taking the time to speak with us today.

Dr Deshmukh: Thanks for having me.

Tylar: To start our conversation today, Dr Deshmukh, research has shown that SARS-CoV-2 potentially triggers various chronic rheumatologic diseases. What are some trends that you are seeing among patients in your clinical practice?

Dr Deshmukh: There have been reports of a wide variety of rheumatologic diseases that appear to be triggered by SARS-CoV-2 infection, including lupus, dermatomyositis, [Grave disease], rheumatoid arthritis, and psoriasis.

In addition, there have been rare cases of necrotizing autoimmune myositis and Guillain-Barré syndrome following SARS-CoV-2 infection. In some patients with COVID-19, the rheumatologic condition is a new diagnosis and can occur in people with or without a family history of rheumatologic disease. In other patients, the virus causes a flare, or exacerbation of symptoms, of a known underlying rheumatologic condition.

Interestingly, rheumatologic conditions may be triggered by SARS-CoV-2 even in patients with mild or no respiratory symptoms with the acute viral infection, thereby necessitating correlation with COVID-19 testing to establish the association.

I should note that imaging findings of SARS-CoV-2 related rheumatologic conditions are not specific to the virus. For patients who have been hospitalized for severe COVID-19, there may be overlap in symptoms from postacute sequelae of COVID-19 and postintensive care syndrome.

Samiha: Thanks, Dr Deshmukh. Those are definitely some interesting points to keep in mind. And, on that note, I wanted to ask, does SARS-CoV-2 infection increase the risk for other conditions, such as chronic heart or brain disorders? And what are the underlying causes and what does this mean for patients with rheumatic disease?

Dr Deshmukh: Although SARS CoV-2 manifests primarily with respiratory symptoms, COVID-19 is now recognized as a multiorgan disease. Numerous extrapulmonary manifestations are now known to occur with SARS-CoV-2 infection, including gastrointestinal symptoms, kidney and liver injury, myocardial dysfunction and acute coronary syndromes, neurologic complications, dermatologic findings, and, of course, musculoskeletal manifestations.

These symptoms may occur in either the acute infection setting or as a chronic complication. Further studies are really needed to elucidate the exact mechanisms of SARS-CoV-2 involvement of multiple organ systems.
Potential pathways of pathogenesis include direct viral invasion, multiorgan injury secondary to cytokine storm, hypercoagulability with in situ thrombosis, and autoimmune mechanisms.

The SARS-CoV-2 RNA virus has a structural spike protein that binds to the angiotensin converting enzyme [(ACE)]-2 receptor on human cells. There is high expression of that ACE-2 receptor in lung epithelial cells, but there is also expression in the heart, kidney, pancreas, spleen, gastrointestinal system, the bladder, the cornea, and blood vessels.

The ACE-2 receptor is also found in the central and peripheral nervous systems and in skeletal muscle. In patients with prolonged symptoms after hospitalization for severe COVID, the pathophysiology behind postintensive care syndrome is multifactorial and it can involve microvascular ischemia, prolonged immobility, and prone positioning, and metabolic alterations during critical illness.

In postacute sequelae of SARS-CoV-2 infection, or “long COVID,” postinfectious autoimmune mechanisms may be to blame. Symptoms of “long COVID” include persistent neurologic, pulmonary, cardiac, and gastrointestinal dysfunction, and for “COVID-19 long haulers,” those symptoms can be debilitating and they can develop even in people who only exhibited mild respiratory symptoms with the acute viral infection.

Tylar: Since you mentioned “long COVID,” why do you think some patients, or the population being referred to as “COVID long haulers,” develop persistent post-COVID symptoms, while others do not?

Dr Deshmukh: You know, that is the great question, and it is a question that many researchers throughout the world are currently trying to answer.

There is early evidence that women are more likely to have persistent post-COVID symptoms, although certainly all genders are susceptible to developing postacute sequelae of SARS-CoV-2 infection.

Patients with severe illness during acute COVID-19, for instance, those who require admission to the intensive care unit and invasive mechanical ventilation are also more likely to have prolonged symptoms, such as dyspnea and muscular weakness.

Identifying the risk factors for both acute and “long COVID” is an important area of research as the world continues to grapple with the pandemic.

Samiha: Definitely, I totally agree. I just wanted to shift our focus to a recent review article you had completed on musculoskeletal involvement of COVID-19. And there, you mentioned that through imaging it is possible to develop better treatment plans for patients still recovering from COVID-19.

Are the treatment goals of patients with COVID-19 alone and patients with COVID-19 and concomitant rheumatic disease the same?
**Dr Deshmukh:** For all patients, my ultimate treatment goal as a radiologist is to optimize quality of life and achieve maximum wellness. Multimodality imaging, including radiography, [computed tomography] (CT), ultrasound, and [magnetic resonance] (MR) imaging can play an important role in the diagnosis and evaluation of COVID-19-related musculoskeletal pathology.

Recent advances in imaging technology have improved diagnostic capabilities for even small structures, such as peripheral nerves, and in the setting of internal hardware, with metal artifact rejection techniques.

Imaging can be utilized for initial diagnosis as well as for follow-up evaluation to assess recovery vs progression of disease. For instance, in patients with inflammatory arthropathy, such as rheumatoid arthritis, serial ultrasound exams can be used to evaluate the presence and degree of synovitis in the hands to guide medication management.

Similarly, for patients with persistent shortness of breath and fatigue after COVID-19, serial ultrasound exams can be used to assess diaphragm dysfunction and guide respiratory rehabilitation.

In cases where tissue sampling is necessary, imaging can also provide procedural guidance.

**Samiha:** Thank you. It’s definitely so interesting to hear the role that imaging can play in looking at the effects of “long COVID.”

Also, in your review article, you noted that SARS-CoV-2 infection can result in various muscular complications and can potentially spread hematogenously or through immune-mediated mechanisms. Such complications include myalgia, myositis, and rhabdomyolysis, which you noted can lead to severe consequences down the line, such as acute kidney failure.

With that being said, for people with preexisting rheumatic disease, how might the course of musculoskeletal alterations differ from patients experiencing the long-term effects of COVID-19 without underlying rheumatic disease?

**Dr Deshmukh:** For patients with preexisting rheumatologic disease, the SARS-CoV-2 virus may cause a flare of their underlying condition. But it’s important to keep in mind that this patient population is also still at risk for the same manifestations of postacute sequelae of SARS-CoV-2 infection as patients without underlying rheumatologic disease.

Since there may be overlap in clinical presentation, careful diagnostic evaluation is necessary and may require imaging and laboratory studies. At present, unfortunately, there are no specific treatments for postacute sequelae of SARS-CoV-2 infection. But [i]dentifying the syndrome is a key first step towards targeted patients in our care. Management often requires a multidisciplinary approach that incorporate treatment of comorbid medical conditions, including preexisting rheumatologic conditions.
Given the complexity and chronicity of symptoms of “long COVID,” coordinated care with frequent follow-up and open communication between subspecialists is necessary. For many patients, referral to a dedicated post-COVID-19 clinic, if available, may be helpful.

**Tylar:** Dr Deshmukh, to tie up everything you said, can you explain the current role of the rheumatologist in combination with the radiologist in the management of patients with COVID-19 and also post-COVID symptoms?

**Dr Deshmukh:** Of course. Rheumatologists play an extremely important role in the management of patients with post-COVID-19 symptoms. To date, there have been over 190 million cases of COVID-19 throughout the world, and in many places, the pandemic is raging on with more and more people infected every day.

This entity that is now referred to as post-acute sequelae of COVID-19 is one that rheumatologists have and will continue to encounter with increasing frequency. Rheumatologists, along with other clinical subspecialists, now have to be responsible for both managing COVID-19 manifestations within their clinical domain as well as communicating with and referring patients to other subspecialties, such as neurology or [physical medicine and rehabilitation] (PM&R) as indicated.

I see my role as a radiologist as providing diagnostic and therapeutic imaging services, but also helping to coordinate care between various clinical subspecialists.

**Tylar:** Very interesting. Lastly, how can the health care system appropriately address the issue of “long COVID” symptoms? How can the needs of these patients be considered during research and in practice?

**Dr Deshmukh:** Guidelines for the evaluation of postacute sequelae of COVID-19 are currently being developed and validated. For many patients with “long COVID,” the impact on quality of life may be substantial and it can have economic implications through disability and lost productivity.

For this reason, several academic hospital centers have created post COVID-19 clinics that offer a multidisciplinary treatment approach. For instance, care teams may include primary care physicians, pulmonology, cardiology, rheumatology, infectious disease, neuropsychiatry, PM&R, and radiology.

Inclusion of social work, physical and occupational therapy, support groups and case management can also be really important. Overall, I believe that the needs of patients with “long COVID” is best addressed with a patient-centered multidisciplinary team-based approach.

**Samiha:** Dr Deshmukh, thank you so much for taking the time to speak with us today. I know I learned a lot from this conversation, and we think our audience will definitely benefit from hearing your insights as well.
**Dr Deshmukh:** Thank you for having me.

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**Meghna:** Please stay tuned for more episodes in this series. For more information on Rheumatology Advisor and this podcast, you can reach out to us at editor@rheumatologyadvisor.com.

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