

Severe post-COVID-19 costochondritis in children

Reagan A. Collins, BA^a , Nandini Ray, MBA^a, Kelly Ratheal, MD^b, and Athos Colon, MD^c

^aSchool of Medicine, Texas Tech University Health Sciences Center, Lubbock, Texas; ^bDivision of Cardiovascular Disease, Department of Internal Medicine, Texas Tech University Health Sciences Center, Lubbock, Texas; ^cDepartment of Pediatrics, University Medical Center Health System, Lubbock, Texas

ABSTRACT

Although children comprise the fewest cases of COVID-19 infection, symptoms, and complications among the various age groups affected, new long-term consequences are being reported. Here, we report a case of severe costochondritis unresponsive to traditional management in a child who had COVID-19 infection a few months earlier. To our knowledge, this is the first reported case of post-COVID-19 costochondritis (PCC) that has been successfully managed with colchicine. We recommend the consideration of colchicine as therapy for PCC in children presenting with severe musculoskeletal chest pain unresponsive to nonsteroidal anti-inflammatory drugs or steroids. Physicians should maintain a high clinical suspicion for PCC to prevent unnecessary steroid treatment, frequent emergency department visits, and potential for drug abuse in these patients with severe chest pain.

KEYWORDS Colchicine; costochondritis; COVID-19; nonsteroidal anti-inflammatory drugs; SARS-CoV-2

As the 2019 coronavirus disease (COVID-19) presses on, several clinical studies have suggested that long-term post-COVID-19 complications can occur in adults, regardless of the initial severity of the disease.^{1,2} Few studies have followed children infected with COVID-19, probably due to their lower rates of severe illness and hospitalization.³ Most post-acute COVID-19 sequelae reported are mild in severity, including postviral cough, fatigue, and inflammatory conditions, and typically resolve within the 3- to 6-month follow-up period.^{1–3} Here, we describe a case of post-COVID-19 costochondritis (PCC) in an 11-year-old boy with a history of hypertension.

CASE DESCRIPTION

An 11-year-old boy with a history of hypertension presented to the family medicine clinic with a 3-day history of nasal congestion, cough, and sore throat. He tested negative for COVID-19 and positive for streptococcal pharyngitis and was started on oral antibiotics. He presented to the emergency department twice over the next week with complaints of worsening chest pain exacerbated by shortness of breath. While a chest x-ray, electrocardiogram, and a repeat COVID-19 test were unremarkable during the first visit,

laboratory results showed elevated D-dimer and a positive COVID-19 antibody test during his second visit.

The patient was admitted for observation and pain control and was given ketorolac, famotidine, and acetaminophen, followed by ibuprofen and pantoprazole, all of which provided relief for only a few hours. He was diagnosed with costochondritis and gastroesophageal reflux disease in the setting of group A streptococcal pharyngitis. He was discharged home the following day on acetaminophen and naproxen for pain and instructed to finish his antibiotic regimen. A third visit to the emergency department due to worsening chest pain with a similar outcome warranted a cardiology appointment following discharge.

Upon presentation at the cardiology clinic, his reproducible chest pain led to a diagnosis of costochondritis and hypertension. After a normal electrocardiogram, the patient was started on propranolol, naproxen, aspirin, iron with vitamin C, and over-the-counter lansoprazole. At his follow-up appointment 1 month later, his chest pain had not improved and he had been unable to attend school due to the pain. He was started on colchicine 0.3 mg daily for 14 days and was instructed to continue his propranolol and lisinopril. A few days after initiation of colchicine, he reported significant temporary relief after each dose of colchicine not lasting all

Corresponding author: Reagan Collins, BS, School of Medicine, Texas Tech University Health Sciences Center, 3601 4th St., Stop 8314, Lubbock, TX 79430 (e-mail: reagan.collins@ttuhsc.edu)

The authors report no conflicts of interest. Informed consent was obtained from the patient's legal guardian to publish this case report.

Received July 6, 2021; Revised August 15, 2021; Accepted August 17, 2021.

day. Colchicine was increased to 0.3 mg twice daily. At his follow-up appointment, he stated that his pain had resolved until he went a few days without colchicine, during which time the pain returned. He continued the regimen for a full 6 weeks and had no recurrence of pain at his 1-month follow-up.

DISCUSSION

Costochondritis is a benign form of chest wall pain due to inflammation of the costal cartilages.⁴ Chest pain in children is generally not due to severe disease and occurs in patients with normal vital signs, labs, electrocardiograms, and chest x-rays.^{4–6} More severe forms of costochondritis can be treated with nonsteroidal anti-inflammatory drugs (NSAIDs), such as naproxen, meloxicam, or ibuprofen.^{4,5} Though other causes of chest pain are rare in adolescents, it is imperative to exclude acute coronary syndrome, pneumothorax, pneumonia, aortic dissection, and pulmonary embolism, among others, using the history of present illness, review of systems, and medical workup prior to this diagnosis.^{4,5}

Compared to the general etiology of costochondritis, this case of costochondritis in an adolescent after COVID-19 infection showed a more severe form of the disease, because it was unresponsive to the conventional treatment of NSAIDs or steroids. Because PCC presents with recurrent symptoms that do not respond to conventional treatment in these adolescent patients, the disease is associated with higher rates of hospital readmission, school absenteeism, and limitations in daily activities.⁷

Colchicine, a drug traditionally used for gout prophylaxis and treatment, has been used off-label to treat several other conditions such as pericarditis due to its anti-inflammatory properties.⁸ Colchicine's ability to reduce pain and inflammation involves disrupting the cellular cytoskeleton, thereby preventing activation, degranulation, and migration of neutrophils associated with gouty inflammation.⁸ Several reviews consider 0.5 mg of colchicine twice daily to be a safe and effective regimen, although a variety of dosing regimens are currently used without consensus based on provider preference.⁹ Many suggest that colchicine can be used to help fight COVID-19 due to its anti-inflammatory and antiviral properties and that it could help to spare the morbidity and mortality associated with the disease.^{10–12} In the search for drugs that can be repurposed, colchicine has been shown to reduce the risk and severity of cardiovascular events while demonstrating rare risks of myopathies, cytopenia, and transaminitis.¹³ Colchicine was successfully administered as an alternative to the standard therapy of NSAIDs to help resolve the pain associated with PCC.

To our knowledge, PCC in adolescents has not been reported in the literature. With the emergence of a greater variety of long-term post-COVID-19 complications in adolescents, we recommend considering PCC as a differential diagnosis if the past medical history includes a diagnosis of COVID-19 within the past few months and symptoms of costochondritis are unresponsive to the accepted treatment of NSAIDs or steroids. We suggest consideration of colchicine as a treatment for PCC due to its anti-inflammatory properties. Larger clinical studies are warranted to determine the effectiveness of this treatment in patients with PCC.

ORCID

Reagan A. Collins  <http://orcid.org/0000-0003-2945-5634>

1. Say D, Crawford N, McNab S, et al. Post-acute COVID-19 outcomes in children with mild and asymptomatic disease. *Lancet Child Adolesc Health*. 2021;5:e22–e23. doi:10.1016/S2352-4642(21)00124-3.
2. Ludvigsson JF. Case report and systematic review suggest that children may experience similar long-term effects to adults after clinical COVID-19. *Acta Paediatr*. 2021;110:914–921. doi:10.1111/apa.15673.
3. Denina M, Pruccoli G, Scolfaro C, et al. Sequelae of COVID-19 in hospitalized children: a 4-months follow-up. *Pediatr Infect Dis J*. 2020;39:e458–e459. doi:10.1097/INF.0000000000002937.
4. Schumann JA, Sood T, Parente JJ. Costochondritis. In: *StatPearls*. Treasure Island, FL: StatPearls; 2021.
5. Reddy SR, Singh HR. Chest pain in children and adolescents. *Pediatr Rev*. 2010;31:e1–e9. doi:10.1542/pir.31-1-e1.
6. Friedman KG, Alexander ME. Chest pain and syncope in children: a practical approach to the diagnosis of cardiac disease. *J Pediatr*. 2013;163:896–901. doi:10.1016/j.jpeds.2013.05.001.
7. Gesuete V, Fregolent D, Contorno S, et al. Follow-up study of patients admitted to the pediatric emergency department for chest pain. *Eur J Pediatr*. 2020;179:303–308. doi:10.1007/s00431-019-03495-5.
8. Sadiq NM, Robinson KJ, Terrell JM. Colchicine. In: *StatPearls*. Treasure Island, FL: StatPearls; 2021.
9. Karatza E, Ismailos G, Karalis V. Colchicine for the treatment of COVID-19 patients: efficacy, safety, and model informed dosage regimens. *Xenobiotica*. 2021;51:643–656. doi:10.1080/00498254.2021.1909782.
10. Schlesinger N, Firestein BL, Brunetti L. Colchicine in COVID-19: an old drug, new use. *Curr Pharmacol Rep*. 2020;1–9. doi:10.1007/s40495-020-00225-6.
11. Vitiello A, Ferrara F. Colchicine and SARS-CoV-2: management of the hyperinflammatory state. *Respir Med*. 2021;178:106322. doi:10.1016/j.rmed.2021.106322.
12. Reyes AZ, Hu KA, Teperman J, et al. Anti-inflammatory therapy for COVID-19 infection: the case for colchicine. *Ann Rheum Dis*. 2021;80:550–557. doi:10.1136/annrheumdis-2020-219174.
13. Misra DP, Gasparyan AY, Zimba O. Benefits and adverse effects of hydroxychloroquine, methotrexate and colchicine: searching for repurposable drug candidates. *Rheumatol Int*. 2020;40:1741–1751. doi:10.1007/s00296-020-04694-2.