

Atypical Presentation of COVID-19 with Complete Heart Block

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Abstract

Background Recent epidemiologic data has indicated coronavirus to be highly contagious with high risk of person-to-person transmission. On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. With the increasing number of confirmed cases and the accumulating clinical data, the cardiac manifestations induced by COVID-19 have generated great concern. COVID-19 was also associated with cardiac arrest, acute-onset heart failure, and myocarditis. COVID-19 has not been reported as the cause of abnormalities of cardiac conduction system. Case Presentation Our patient was transferred from a long-term care facility with history of new onset bradycardia and fall. Patient had no classical symptoms of viral infection, including fever, dyspnea or any classical radiological finding like bilateral ground glass opacities. Initial EKG was noted for 3rd degree AV and heart rate 30 BPM. He was taken to cardiac catheterization lab for an emergent temporary transvenous pacemaker. Patient subsequently had permanent pacemaker implanted electively. Discussion and Conclusions This case represents cardiac conduction abnormality requiring therapeutic pacing as a presenting symptom of SARS-CoV-2. Health care professionals need to be vigilant about atypical, novel presentation of this disease in patients belonging to risk groups such as over 60 years age, immunocompromised, residents of long-term facilities, and with medical conditions such as heart disease, lung disease, diabetes, stroke, renal disease, cirrhosis, and diabetes. Currently there is no proven treatment for this infection and individuals in these at-risk groups are susceptible to higher morbidity and mortality.

Introduction

On December 31, 2019, several cases of pneumonia-like illness were attributed to a seafood wholesale market in the Wuhan province of China (1). On January 7, 2020, the public health officials in China confirmed that these cases were caused by the novel severe acute respiratory distress syndrome coronavirus 2, SARS-CoV-2, also referred to as COVID-19 (2). Recent epidemiologic data has indicated coronavirus to be highly contagious with high risk of person-to-person transmission (3,4). On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. As of April 9, 2020, there have been a total of 1,587,209 cases and 95,455 deaths reported in at least 209 countries (5). As of April 9, 2020, 456,828 of these cases and 16,548 of these deaths have been reported in the United States (5).

Age, male sex, and comorbidity seem to be risk factors for poor outcomes in COVID-19 patients. Despite a low overall case fatality rate of 2.3%, mortality rates among COVID-19 cases are higher among elderly (14.8% in patients over 80 years) and among patients with cardiovascular disease, hypertension, and diabetes (10.5%, 6.0%, and 7.3%, respectively) (6). Earlier study suggested the most common symptoms associated with COVID-19 are fever (88%) and dry cough (67.7%). Less common symptoms include rhinorrhea (4.8%) and gastrointestinal symptoms such as diarrhea (4-14%) and nausea (5%)(7). 14% of patients experienced severe symptoms such as shortness of breath, hypoxia, and respiratory distress. 5% of patients were critical requiring mechanical ventilation in an intensive care unit with clinical presentation of respiratory failure, septic shock, and/or multiorgan failure (8).

Radiological investigations including chest x-ray and CT scan of chest are characterized by findings of bilateral ground glass interstitial infiltrates indicative of atypical pneumonia. Laboratory workup often shows leukopenia and thrombocytopenia. There can be associated transaminitis as well as elevated ESR, ferritin, LDH, and d-dimer. Complications include acute respiratory distress syndrome (ARDS), acute cardiac injury, and secondary infections (9).

With the increasing number of confirmed cases and the accumulating clinical data, the cardiac manifestations induced by COVID-19 have generated great concern. Recent study of 138 patients hospitalized with COVID-19 infection showed 16.7% and 7.2% patients later developing arrhythmia and acute cardiac injury, respectively (10). In a separate study 12.5% of patients with COVID-19 were diagnosed with acute myocardial infarction, manifested with elevated cardiac enzymes (9). COVID-19 was also associated with cardiac arrest, acute-onset heart failure, and myocarditis. COVID-19 has not been reported as the cause of abnormalities of cardiac conduction system. We present a case report that describes presence of high-grade atrioventricular (AV block) requiring pacemaker support in a patient affected by COVID-19.

Clinical Presentation

77-year old male with a past medical history of hypertension, vascular dementia, hyperlipidemia, peripheral neuropathy, major depressive disorder, and 1st degree AV block was brought to the hospital from nursing home for bradycardia with heart rate of 32 BPM. Per records, patient sustained a fall at the nursing home two days prior to hospital admission. Patient had no prior history of falls or bradycardia. Patient had no history of taking any medication known to cause AV conduction delay. Physical exam was noted for bradycardia, clear breath sounds bilaterally, and neurologically patient was alert and oriented to self only. Initial EKG was noted for 3rd degree AV block with junctional escape rhythm, right bundle branch block with left anterior fascicular block, and HR of 30 BM (*Figure 1*). Chest x-ray was noted for some bilateral airspace opacities (*Figure 2*). Initial troponin was 0.018 ng/mL. BUN 30 mg/dL. Creatinine 1.42 mg/dL. BNP 892 pg/mL. Atropine was given and it transiently increased the HR to 50 BPM and the HR subsequently dropped to high 20s BPM. Cardiology evaluated the patient and he was taken to cardiac catheterization lab for an emergent temporary transvenous pacemaker. Patient subsequently had permanent pacemaker implanted electively.

Discussion

COVID-19 is a global pandemic evolving in real time. Our knowledge of the novel coronavirus and its cardiovascular manifestations is limited and evolving daily. Cardiovascular complications, thus far, have been commonly found in patients with COVID-19 and such patients are at a higher risk of morbidity and mortality. Acute myocardial injury is present in more than 12% of critically ill COVID-19 patients and acute heart failure can develop as the illness severity intensifies. Herein, we describe a patient without a history of cardiovascular disease admitted to the hospital with 3rd degree heart block who was tested positive for COVID-19. Although the exact pathophysiological mechanism underlying cardiac electrical conduction system is not fully understood, a previous study showed that SARS-CoV genome was detected in the heart of 35% the patients with SARS-CoV infection. This raises the possibility of direct damage of cardiac conduction system and cardiomyocytes by the coronavirus (11). One potential mechanism is angiotensin-converting enzyme 2 (ACE2). Coronavirus appears to be affecting cells that express the ACE2 protein, including myocardial and vascular cells. Other suggested mechanisms include a cytokine storm, mediated by abnormal T helper cells and hypoxia-induced high intracellular calcium resulting in cardiac myocyte apoptosis. This case report highlights the first 3rd degree heart block case in a patient with COVID-19. Novel coronavirus is an important differential to consider in a patient presenting with symptomatic bradycardia and diagnosed with AV conduction abnormalities.

Disclosures: None

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Figure 1 : Electrocardiogram

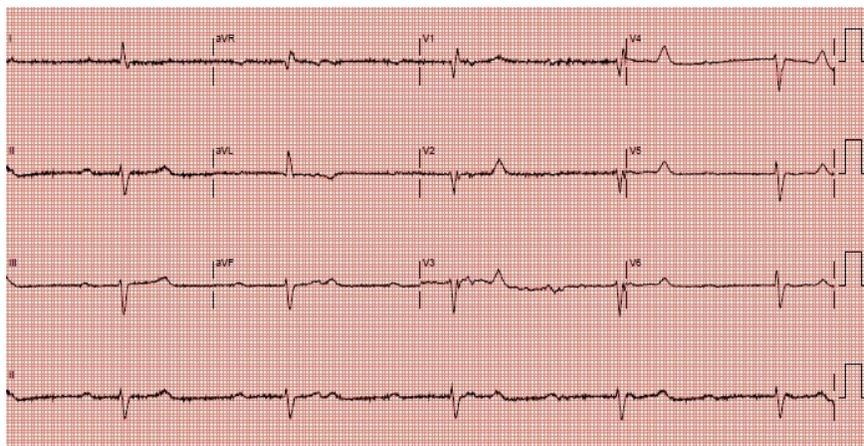


Figure 2: Portable Chest X-ray

