

MYOPERICARDITIS IN SALMONELLA ENTERITIS INFECTION

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Introduction:

Salmonella enteritis is a major cause of diarrhea world wide and nontyphoidal salmonella is the most common pathogen for food borne illness in the United States. Majority of nontyphoidal salmonella infections are limited to gastroenteritis. However, salmonella enteritis can have many extra-intestinal manifestations such as bacteremia, meningitis, pneumonia, osteomyelitis, septic arthritis, and endocarditis. There have been a handful of case reports that have discussed salmonella enteritis causing cardiovascular complications and in this article we report a case of salmonella enteritis causing myopericarditis.

Case:

17 year old obese caucasian male with a past medical history of Type II Diabetes Mellitus, Hypertension, Hypothyroidism, OCD, Bipolar type I, ADHD was transferred from an outlying community hospital to a children's hospital for sepsis secondary to a gastrointestinal infection. At admission the patient reported having nausea, vomiting and bloodydiarrhea for two days. He experienced a total of twenty bowel movements on the day of his admission. The patient's stool cultures were positive for salmonella which was in line with our suspicion, since the patient's grandmother at the time was admitted to the ICU with acute renal failure secondary to salmonella enteritis. In conjunction with pediatric infectious disease, he was started on IV Ceftriaxone for a total of 3-5 days based on clinical response. On hospital day 2, the patient developed non-radiating sub-sternal chest pain that occurred suddenly and was worse with walking, standing and laying flat. He did not have any accompanied dyspnea, diaphoresis, or palpitations. On exam the patient did not exhibit any extra heart sounds or a pericardial friction rub and the chest pain was reproducible with palpation. It was initially assumed to be musculoskeletal in nature, likely caused by the patients recurrent emesis due to salmonella enteritis. However, the patient's chest pain persisted through the next day and a limited cardiac work up was ordered to rule out myocardial ischemia.

His initial ECG showed diffuse ST elevation, a Troponin level of 12 and CK-MB level of 29.2. Cardiology was immediately consulted and a transthoracic echocardiogram was performed and noted to be normal and without any pericardial effusion. By this time the patients chest pain became transient, migratory and worse with sitting up in bed; fairly atypical symptoms for pericarditis. As per Cardiology the patient was started on Indomethacin 25 mg three times a day. A repeat Troponin level six hours later was 8.770 and continued to trend down to 5.610 six hours later. We repeated his troponin level the following day and it continued to decrease with a level of 2.980. By this time the patient's chest pain resolved and his bloody diarrhea had significantly improved. A repeat ECG showed normal sinus rhythm with sinus arrhythmia and intraventricular conduction delay. On the day of his discharge, it was discovered that Indomethacin can

cause increases in Lithium levels by 50%, and he was subsequently switched to Aspirin 325 mg daily for one month.

After discharge the patient continued to see a cardiologist, a repeat ECG and echocardiogram were both normal and he was noted to remain asymptomatic without recurrence of chest pain.

Due to the patients salmonella enteritis, clinical symptoms, and abnormal cardiac testing, a diagnosis of myopericarditis was established.

Discussion:

Salmonella are gram-negative bacilli that enter the human body via food borne transmission, most commonly from undercooked eggs, meats and chicken. Salmonellae can cause many types of infections such as gastroenteritis, bacteremia, focal infections such as abscesses and osteomyelitis, and endocarditis. There are multiple types of salmonella infections but is the nontyphoidal salmonella that usually results in gastrointestinal infections. A very rare complication of salmonella enteritis are myopericarditis, associated arrhythmias, and infected aneurysms. It is not well established on how salmonella species is able to infect endothelial lined structures such as the heart but the potential mechanisms are direct invasion of myocardium, influence of toxins and immunologically mediated myocardial damage.

In this case, a diagnosis of myopericarditis was made based on the patient's clinical symptoms of chest pain, ECG changes with ST elevations, and elevated cardiac enzymes. A definitive diagnosis is typically made by endomyocardial biopsy with histological evaluation of the biopsy based on the Dallas Criteria, however it was deemed unnecessary for our patient due to clinical improvement with treatment of salmonella enteritis. Other recommended diagnostic testing indicated for myopericarditis are echocardiography and cardiac magnetic resonance imaging (MRI). Our patient did undergo echocardiography did not show any ventricular dysfunction. Myopericarditis is very often caused by viral infections, autoimmune disorders, and certain drugs; very rarely it is caused by bacteria. It should be suspected in patients with chest pain that develops within 2-3 days of the onset of gastrointestinal symptoms, and a cardiac work up should be thus initiated. There are previous case studies to support bacterial infections of the gastro-intestinal system, in the study of Theler-Ballmer et al. 8 of 103 patients of salmonellosis presented with clinical and laboratory findings of myocarditis. Clinicians should be vigilant for the development of myopericarditis in patients with bacterial gastrointestinal infections as the complications are grave, such as the development of dilated cardiomyopathy and sudden death.

Treatment for myopericarditis is not well established due to the rarity of this disease. The current recommendations are to treat with NSAID therapy and standard therapy if any findings of heart failure are present. NSAID therapy should be evaluated against the degree of myocardial involvement as animal studies have showed an increase in mortality with NSAID treatment. It is good practice to start with lower anti-inflammatory

doses to help control symptoms. Other modes of potential treatment include corticosteroid use, colchicine, and IVIG. Patients should be instructed to abstain from alcohol and high level exertion and close follow up with repeat echocardiography at 1 month, 6 months and year.

Conclusion:

Myopericarditis is a rare complication of bacterial gastrointestinal infections. Due to its very serious cardiovascular complications it is important to perform cardiac testing in patients with enteritis and new onset chest pain. Testing should start with an ECG and cardiac enzymes. Cardiac echocardiography, MRI, and coronary angiography may be necessary if any abnormal ECG and cardiac enzymes are abnormal. Treatment should start with NSAID therapy and in the setting of cardiac dysfunction, standard heart failure therapy is recommended. Resolution of myopericarditis in the setting of enteritis is typically achieved with treatment of the bacterial pathogen as seen in our patient. Due to the limited available literature of salmonella myopericarditis, additional research is warranted.

References:

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