A Rare Case of Non-rheumatic Streptococcal Acute Myocarditis

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Abstract
Non-rheumatic Streptococcal Acute Myocarditis, also known as Strep Pharyngitis Acute Myocarditis (SPAM), occurs in young adults, typically within five days of the initial streptococcal pharyngitis, and is characterized by typical cardiac symptoms, abnormal electrocardiography, and elevated cardiac biomarkers in the absence of obstructive coronary artery disease. Patients may also report myalgias, arthralgias, and constitutional symptoms. Although a rare complication of Group A and G streptococcal infections, prompt recognition is important to ensure appropriate management. This article discusses the case of a 33-year-old male who presented with substernal chest pain and monoarticular arthralgia two days after diagnosis with streptococcal pharyngitis, and reviews available literature on the evaluation and management of SPAM.

Keywords: Myocarditis; Streptococcal infection

Background
Non-rheumatic Streptococcal Acute Myocarditis, also known as Strep Pharyngitis Acute Myocarditis (SPAM), occurs in young adults and is more common in males. It presents with sub-sternal chest pain associated with nausea, dyspnea, myalgias or arthralgias. ST segment elevation is present on electrocardiogram, identical to the changes found with acute myocardial infarction. Symptoms of SPAM typically present within 5 days of the initial streptococcal infection. This is a rare complication of Group A and G Strept infections; however, based on literature review it is likely more prevalent as many cases remain undiagnosed at the time of presentation [1-3].

Case Presentation
A previously healthy 33 years old male presented to the emergency department after awakening with sub-sternal chest pain and tightness radiating to his left arm. Associated symptoms included nausea, dyspnea and pain in his left knee.

Two days previously he had been evaluated at a local urgent care for a sore throat and was started on oral amoxicillin based on a positive rapid strep A test; his sore throat had resolved.

On examination, vital signs were stable. Heart was regular rate and rhythm without murmurs, ruts or gallops. Lungs were clear to auscultation. The left knee exam was benign, without effusions, erythema or increased warmth.

The electrocardiogram (Figure 1) revealed ST segment elevation in the anterior and inferior leads and ST segment depression in V1 and V2. Labs revealed a peak troponin-I of 22.0, creatine phosphokinase of 857 and CK-MB of 14.2.

Figure 1: Electrocardiogram at time of admission with ST elevation in anterior and inferior leads with ST depression in V1 and V2.

An emergent transthoracic echocardiogram (Figure 2) showed mild apical hypokinesis, without systolic dysfunction, valvular dysfunction or pericardial changes. The patient was taken for a cardiac catheterization with angiography which revealed no angiographic evidence of coronary artery disease. Cardiovascular magnetic resonance could not be performed to confirm clinical diagnosis of myocarditis due to local unavailability of the equipment [4].

Based on ST segment elevation, elevated cardiac biomarkers, normal angiography, and failure to meet the Revised Jones Criteria for diagnosis of Acute Rheumatic Fever (ARF) [5], the patient was diagnosed with Non-Rheumatic Streptococcal Acute Myocarditis (SPAM). He was treated with oral amoxicillin and non-steroidal anti-inflammatories with resolution of his chest pain.
Figure 2: Mild hypokinesis of the apical segment of the left ventricle with normal wall motion of the rest of the left ventricle.

Discussion

Diagnosis of SPAM requires three things: exclusion of rheumatic fever, confirmation of preceding streptococcal infection, and evidence of myocardial involvement not due to obstructive coronary artery disease. Rheumatic fever is ruled out using the Revised Jones criteria for diagnosis of ARF [5]. Of note, acute rheumatic fever typically has a 2-3 week latency period, while SPAM's is typically less than 5 days. Group A or Group G streptococcal infection can be confirmed by typical symptoms in combination with a positive rapid antigen detection test or culture.

Cardiac Magnetic Resonance (CMR) with focal subepicardial late gadolinium enhancement is the gold standard for diagnosis of myocarditis [3]. Since this specialized test is not widely available, other findings that support the diagnosis include: 1) electrocardiogram with ST segment elevation and reciprocal changes; 2) echocardiography with new wall motion abnormalities or hypokinesis; and 3) normal coronary angiography.

Two case series support the use of CMR for confirming resolution of myocarditis as well. Mokabberi et al. reported eight patients with SPAM confirmed with CMR with focal subepicardial late gadolinium enhancement in whom follow-up CMR confirmed resolution of myocarditis [3]. Similarly, Upadhyay et al. reported a case series of nine patients, three of whose diagnosis was confirmed using Cardiac Magnetic Resonance. Two of these had repeat testing that confirmed resolution [6].

Treatment for SPAM focuses on eradication of the streptococcal infection, use of anti-inflammatories, evidence-based medical management for non-ischemic cardiomyopathy as needed, and documentation of resolution of the myocarditis.

As for uncomplicated cases of streptococcal pharyngitis, penicillin remains the first line antimicrobial agent, as supported by several case series [3,6,7]. Alternatives include cephalosporins and, for patients with severe penicillin allergies, erythromycin. The first line anti-inflammatory agent should be a non-steroidal anti-inflammatory drug (i.e. naproxen sodium, ibuprofen) although corticosteroids remain an option for those with contraindications such as bleeding or kidney disease. While cardiomyopathy in these patients is generally self-limited, treatment with beta blockers, angiotensin converting enzyme inhibitors/angiotensin receptor blockers and diuretics (for symptom control) is warranted [3].

Conclusion

There needs to be a high suspicion for Non-Rheumatic SPAM when a young adult presents with cardiac symptoms within a few days of confirmed streptococcal pharyngitis. Acute Rheumatic Fever needs to be ruled out using the Revised Jones Criteria. In the setting of ST segment elevation on electrocardiogram and elevated cardiac biomarkers, obstructive coronary artery disease should be excluded with either coronary angiography or CMR. CMR is the gold standard for diagnosing myocarditis and confirming its resolution. Treatment includes penicillin and anti-inflammatories.

References