

# Influenza A Infection Unmasking an Underlying Mitral Valve Stenosis in a 19-Year-Old Boy

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## ABSTRACT

Infection with Influenza virus is uncommon in the present times, though a number of cases were reported during pandemics in 1918 in various regions of America. We report a case where a young male patient presented to the hospital with a clinical picture of acute respiratory distress syndrome that turned out to be a viral pneumonia caused by Influenza A virus and it aggravated an underlying yet undiagnosed mitral valve stenosis.

**Keywords:** Guillain-barre syndrome, influenza A, mitral valve stenosis, pandemics, reye's syndrome, *Staphylococcus aureus*

## Introduction

It is an established fact that Influenza A has a predilection for individuals with cardiac diseases, especially with mitral stenosis.<sup>[1]</sup> Influenza is an acute illness caused by infection with influenza viruses. It usually involves the upper and lower respiratory tracts and is accompanied by fever, headache, myalgias and generalized weakness. Outbreaks occur almost every year but they vary in extent and severity. The recent pandemic which occurred in March 2009 was caused by an Influenza A/H1N1 virus. The typical manifestation of the disease is that of an acute illness which progresses rapidly and the patient usually recovers in a period of three to five days, but some patients develop pulmonary complications like primary influenza viral pneumonia, secondary bacterial pneumonia, mixed viral and bacterial pneumonia and worsening of chronic obstructive lung diseases. Extrapulmonary complications like Reye's syndrome, myositis, rhabdomyolysis and myoglobinuria, myocarditis, pericarditis, encephalitis, transverse myelitis and Guillain-Barre Syndrome (GBS), toxic shock syndrome associated with *Staphylococcus aureus* or Group A streptococcus are also known to occur.

## Case Report

A 19-year-old male patient presented to the emergency with

complaints of high-grade fever since 8-12 days, not associated with chills, along with difficulty in breathing and hemoptysis since one day. On admission his temperature was 102°F, blood pressure (BP) = 94/58 mm of Hg, heart rate (HR) = 152 bpm, SpO<sub>2</sub> = 88% with oxygen support. On examination the patient was conscious, tachypneic, dyspneic and was using accessory muscles for breathing. Bilateral coarse crepitations were present and the air entry was reduced bilaterally. Cardiac examination revealed a loud first heart sound, tachycardia; no murmur was, however, audible. Neck veins were engorged and abdominal examination revealed hepatomegaly 4 cm below the costal margins. Routine blood tests, Arterial Blood Gas analysis and a throat swab were sent for examination. Chest X-ray revealed B/L homogenous opacities involving middle and basal lung fields [Figure 1]. ABG showed pH = 7.40, pCO<sub>2</sub> = 22 mm of Hg, pO<sub>2</sub> = 56 mm of Hg, HCO<sub>3</sub> = 23 meq/l. The patient was given Bi-PAP support and empiric treatment was started keeping a possibility of viral pneumonitis among the differentials. Complete blood count (CBC) showed a Total Leucocyte Count of 8820/mm<sup>3</sup>, DLC = P85%, L13%, E2%, Hb = 11.8g/dl, Platelet count = 94000/mm<sup>3</sup>, Blood urea = 38 mg/dl, Sr. creatinine = 0.9 mg/dl, Sr.K<sup>+</sup> = 3.4 meq/l, Sr. Na<sup>+</sup> = 140 meq/l, Sr. bilirubin = 4.2 mg/dl, (direct = 2.1 mg/dl, indirect=2.1 mg/dl). Total Sr.protein=4.9g/dl, Sr.albumin=2.3mg/dl, Sr. globulin = 2.6 mg/dl, AST = 116U/L, ALT = 48U/L, Sr. alkaline phosphatase = 91 U/L and CPK-MB = 28 ng/dl. A 2D-ECHO showed severe mitral valve stenosis (valve area = 0.93 cm<sup>2</sup>), moderate tricuspid regurgitation, moderate pulmonary hypertension and a dilated right and left atrium. The throat swab culture was positive for Influenza A. The patient gradually improved over a period of

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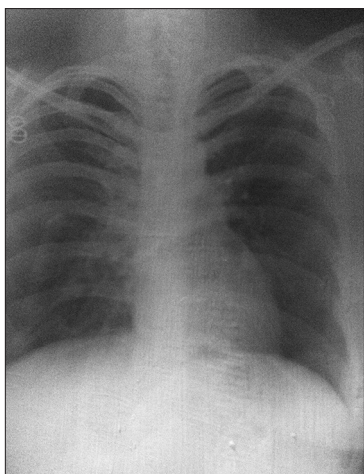
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**Figure 1:** Chest X-ray PA view

ten days and was subsequently referred to cardiothoracic surgery for management of mitral stenosis.

### Discussion

A high proportion of allegedly pure viral pneumonias have been reported in patients with heart disease, especially mitral stenosis. Although these patients have not usually been in frank heart failure, it is possible that circulatory factors have played some part in their deaths.<sup>[2]</sup> Primary influenza viral pneumonia has a predilection for individuals with cardiac diseases, particularly those with mitral stenosis.<sup>[3]</sup> It has been observed that the presence of mitral stenosis in a patient predisposes him/her to infection with Influenza A. So patients with a known lesion must be considered as high-risk candidates for Influenza during pandemics.<sup>[4]</sup> Autopsy sample of young females during the H1N1 epidemic in 2009-10 showed Grade 2 mitral stenosis.<sup>[5]</sup> It further highlights the association between the two.

Extrapulmonary complications of influenza such as cardiac involvement like myocarditis, pericarditis have also been

reported in some earlier studies.<sup>[6]</sup> In influenza outbreaks since 1918, primary viral pneumonia has occurred predominantly among individuals with cardiovascular diseases, especially rheumatic heart disease with mitral stenosis.<sup>[7]</sup> Hence patients suffering from Influenza A must be closely observed and if they show symptoms of cardiac failure, they must be evaluated for the presence of underlying mitral stenosis. This is in agreement with the present case wherein the patient presented with acute respiratory distress and was diagnosed as a case of Influenza A, and had an underlying but undiagnosed mitral stenosis.

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