

# Acute Pancreatitis may be Caused by H1N1 Influenza A Virus Infection

Arnon Blum MD, Oxana Podvitzky MD, Rafea Shalabi MD and Claudia Simsolo MD

Department of Medicine A, Poria Medical Center, Lower Galilee, Israel

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Influenza A (H1N1) virus is a subtype of influenza virus A and the most common cause of influenza in humans. Some strains of H1N1 are endemic in humans and cause a small fraction of all influenza-like illness and a large fraction of all seasonal influenza. H1N1 strains caused roughly half of all human flu infections in 2006 [1]. Other strains of H1N1 are endemic in pigs (swine influenza) and birds (avian influenza). In June 2009, the World Health Organization declared that flu due to a new strain of swine-origin H1N1 was responsible for the 2009 flu pandemic. This strain is often called "swine flu" by the public media.

Influenza A virus strains are categorized according to two proteins found on the surface of the virus: hemagglutinin (H) and neuraminidase (N). All influenza A viruses contain hemagglutinin and neuraminidase, but the structures of these proteins differ from strain to strain due to rapid genetic mutation in the viral genome. Influenza A virus strains are assigned an H number and an N number based on which forms of these two proteins the strain contains. There are 16 H and 9 N subtypes known in birds, but only H 1, 2 and 3, and N 1 and 2 are commonly found in humans [2]. In 2009 more than 99% of circulating influenza viruses identified in the United States were 2009 H1N1 influenza, previously referred to as novel influenza A (H1N1). The clinical

presentation of patients with uncomplicated 2009 H1N1 influenza virus infection is generally similar to seasonal influenza and includes abrupt onset of fever, cough, sore throat, myalgias, arthralgias, chills, headache and fatigue. Vomiting and diarrhea have been reported more often with 2009 H1N1 flu than with seasonal flu. As with seasonal flu, some patients with 2009 H1N1 flu present without fever.

The U.S. Centers for Disease Control recommends early empiric antiviral treatment for suspected or confirmed influenza in hospitalized patients and in outpatients at higher risk for complications (<http://www.cdc.gov/h1n1flu/recommendations.htm>). Empiric antiviral treatment, when indicated, should be initiated as early as possible and should not be delayed pending the results of influenza testing.

## PATIENT DESCRIPTION

We report a 37 year old man who was admitted with epigastric abdominal pain that started on the day of admission. Three days earlier he started to suffer high fever (38°C) together with sore throat, myalgia and malaise.

On the day of admission he had severe epigastric abdominal pain without nausea or vomiting. The physical examination was normal except for tender upper abdomen, but without rigidity. Blood pressure was 95/54 mmHg, 80 beats per minute, 96% O<sub>2</sub> saturation, 12 respirations/min. There were no signs of distress except for the painful abdomen. The cardiorespiratory system was normal, as was the neurologic examination.

Sedimentation rate was 30 mm in the first hour, hemoglobin 13.7 g/dl, 4680 leu-

kocytes/mm<sup>3</sup>, and 161,000 platelets/mm<sup>3</sup>. Biochemical results were normal except for amylase 600 U/L (that decreased to 70 u/L after 48 hours) with aspartate aminotransferase that was elevated (79 u/L) and returned to normal values (33 u/L) within 24 hours. The international normalized ratio and partial thromboplastin time were normal and the lipid profile was also within normal limits (cholesterol 111 mg/dl, triglycerides 63 mg/dl).

Chest and abdominal computed tomography did not demonstrate any abnormality, the pancreas showed no signs of edema or inflammation, and the gallbladder and the biliary ducts had no stones or sludge and no signs of inflammation.

Since the suspected clinical diagnosis was acute pancreatitis, the patient was treated with a combination of antibiotics and Tamiflu® (Roche) 75 mg twice daily after a throat culture for H1N1 influenza virus swabs was taken from the throat and the nostrils and found to be positive for H1N1.

Twenty-four hours from the start of the combined treatment with antibiotics and Tamiflu, the patient's condition improved dramatically and most of his symptoms disappeared.

## COMMENT

Viruses can cause acute pancreatitis, but this is the first description of a possible H1N1 influenza A infection causing acute pancreatitis that resolved quite quickly. Our patient may represent a new clinical presentation of H1V1 Influenza A infection – the "swine flu" type. Although he did not have all the requisite signs of acute

pancreatitis, he had upper abdominal pain with high levels of amylase that returned to normal within 24 hours. The abdominal CT did not demonstrate signs of pancreatitis or biliary tract disease; however, the abdominal pain with the high amylase level could suggest acute pancreatitis. His low sedimentation rate and low leukocyte count may also suggest a viral infection that affected the pancreas.

Several reports have described viral pancreatitis: acute pancreatitis caused by mumps in a 34 year old woman [1], patients with human immunodeficiency virus [2,3], and patients infected with hepatitis E [4] and hepatitis A [5]. It was found that pancreatitis remains a significant cause of morbidity in the HIV population in the HAART era.

Acute pancreatitis is associated with female gender, severe immunosuppres-

sion, and use of stavudine and aerosolized pentamidine [3]. The risk of acute pancreatitis among patients with HIV has been significantly associated with age, race, symptomatic HIV infection, and liver and cardiovascular disease [3]. One of the patients described suffered acute pancreatitis while he had an acute infection (immunoglobulin M antibodies) with hepatitis E, and the common etiologies were excluded [5]. Another reported patient had acute pancreatitis caused by hepatitis A [5].

Our patient had acute upper abdominal pain together with high fever and symptoms and signs of an acute viral infection; this was diagnosed as an acute infection with the H1N1 influenza A virus, the "swine flu" type. To the best of our knowledge this is the first report of this clinical condition, which may suggest that H1N1 virus can cause acute pancreatitis.

### Corresponding author:

**Dr. A. Blum**

Dept. of Medicine, Poria Medical Center, Lower Galilee 15208, Israel

**Tel/Fax:** (972-4) 665-2687

**email:** [ablum@poria.health.gov.il](mailto:ablum@poria.health.gov.il),  
[navablum@hotmail.com](mailto:navablum@hotmail.com)

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HIV = human immunodeficiency virus

HAART = highly active antiretroviral therapy