

# Influenza A infection with rhabdomyolysis and acute renal failure – a potentially fatal complication

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**Summary:** This paper describes a case of influenza A infection complicated by rhabdomyolysis and acute renal failure. This very rare complication is particularly important as symptoms may be non-specific and therefore ascribed to the underlying influenzal illness.

## Introduction

Although myalgic symptoms are almost invariable in influenzal illnesses, myositis and myoglobinuria appear to be extremely rare and have been documented only in influenza A infection.<sup>1,2</sup> Myalgia is usually prominent early in the illness, contrasting with available descriptions of influenza-associated myositis where onset is after or during resolution of respiratory symptoms.<sup>1–3</sup> We present a case of influenza A infection complicated by rhabdomyolysis and acute renal failure, a syndrome described only once previously.<sup>2</sup> This complication is particularly important because, as in this patient, its clinical presentation may be subtle, and failure to recognize it could have had fatal consequences.

## Case report

A previously fit 65 year old man presented with a 1-week history of fever, generalized myalgia and dry cough. For 24 h prior to admission he had become aware of marked oliguria, passing very small volumes of dark brown urine. On examination, he was afebrile and not acutely unwell. There was no objective evidence of muscle tenderness or weakness. Occasional inspiratory crackles were audible over the postero-inferior aspect of the right lung field. Blood pressure was 160/105 mmHg. Laboratory investigations included a normal full blood count and serum biochemistry consistent with established severe acute renal failure (sodium 119 mmol/l, potassium 6.1 mmol/l, urea 46.5 mmol/l, creatinine 1199 µmol/l). Urine analysis showed 2+ proteins, 2+ blood and microscopy 50 red blood cells/high powered field

with no casts. Urinary biochemistry was compatible with acute tubular necrosis (sodium 72 mmol/l, potassium 26 mmol/l, urea 78 mmol/l; urinary: serum osmolality less than 1.1:1). The serum aspartate transaminase was 427 IU/l (normal range 16–41) and the creatine kinase 17,739 IU/l (normally less than 170). Urine immunoassay for myoglobin was positive. Complement fixation tests showed an 8-fold titre rise against influenza A in paired samples taken on admission and 6 days later. There was no serological evidence of acute infection with other common viruses, *Mycoplasma pneumoniae* or legionella. The chest radiography showed patchy right middle lobe consolidation.

A diagnosis of influenza A infection was made with complicating features of pneumonia, polymyositis, rhabdomyolysis and acute renal failure. The patient was subsequently transferred to a specialist renal unit for management, including haemodialysis. Seven days after admission there, he regained urine output with rapid subsequent falls in serum urea and creatinine towards the normal range.

## Discussion

Serious and potentially fatal complications of acute influenza infection include pneumonia (occasionally with superimposed staphylococcal infection), myocarditis or pericarditis, and a variety of neurological disorders including encephalitis, myelitis and Guillain-Barré syndrome.<sup>4</sup> These complicating diseases are usually appreciated clinically, as they present with symptoms and signs distinct from the underlying viral illness. In this case, however, myalgic symptoms and oliguria could well have been ascribed to influenza itself, with associated fever and poor fluid intake. The only previous similar report<sup>2</sup> pointed to muscle tenderness as an

important feature distinguishing myositis from simple myalgia. Tenderness was, however, conspicuously absent in this patient, further adding to the potential diagnostic difficulty.

Non-traumatic rhabdomyolysis and acute renal insufficiency occur with increased muscle energy consumption (strenuous exercise, delirium tremens, tetanus, status epilepticus), unusual genetic and metabolic disorders, overdoses of sedative drugs or alcohol and occasionally systemic bacterial or viral infections.<sup>5</sup> Other viral causes include cytomegalovirus,<sup>6</sup> Coxsackie<sup>7</sup> and herpes-group viruses.<sup>8</sup> In recent years, there have also been repeated descriptions of rhabdomyolysis with renal failure associated with legionella.<sup>9-11</sup> Although the ultimate mechanism of non-traumatic muscle injury is unknown, available evidence suggests either decreased availability or impaired capacity of muscle to utilize energy substrates.<sup>5</sup> Similarly, the mechanism by which myoglobinuria causes

acute renal failure is unknown. Hypotheses include renal tubular obstruction by precipitated myoglobin, reduction in renal blood flow, and direct toxic injury to the tubular epithelium.<sup>5</sup>

No study has examined prospectively the incidence of myoglobinuria and acute renal insufficiency in influenzal epidemics. It is conceivable that less serious forms of this syndrome are more common than formerly appreciated, as their presentation may be asymptomatic and recovery in renal function spontaneous. Physicians, and particularly general practitioners, should be aware of this important complication and maintain a high index of suspicion for it.

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