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Adenovirus Induced Rhabdomyolysis Causing Hemodialysis Dependent Acute Renal Failure

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Discussion

We report a case of healthy 39 year old African American male who presented with acute febrile illness which was preceded with symptoms suggestive of viral conjunctivitis. Past medical history is significant for essential hypertension for which he takes valsartan.

The patient was in his usual state of health until approximately 2 weeks before his hospital admission when he noticed myalgia and drainage in his left eye consistent with a viral conjunctivitis. He had associated self remitted diarrheal illness.

Shortly thereafter in the next couple of days he developed severe muscle aches to an extent of impaired ambulation and associated with increased fatigability, subjective fevers with chills.

He had around this time developed “Stark urine” for which he was evaluated at his PCP’s office where a urine dipstick was positive for blood. He was given a script for Trimethoprim-sulfamethoxazole empirically for presumed urinary tract infection.

The hematuria continued afterwards. He eventually became oliguric, for which he presented to ER at our facility and was admitted under the care of nephrology.

His urinalysis was positive for protein and blood. Urine myoglobin was positive. Multiplex real-time RT-PCR assay performed on his urine was positive for adenovirus.

On further questioning he said his symptoms were not preceded by any specific medication changes, denied statin use, wild game, crush injury or compartment syndrome.

The hematuria continued afterwards. He eventually became oliguric, for which he presented to ER at our facility and was admitted under the care of nephrology.

On physical examination, his blood pressure was 150/82 mmHg, heart rate was 85 beats per minute, temperature 96.3°F, respiratory rate 14 breaths per minute, and his oxygen saturations were 96% room air.

On presentation he was found to have oliguric renal failure with creatinine of 5.04 (previous unknown baseline) with significant anemia, hyperkalemia, hyperphosphatemia, and hypocalcemia. The serum CPK level was elevated at 857,200 U/L (normal ≤ 35).

Laboratory data during course of the patient’s illness are given in Table 1 and Table 2.

His urinalysis was positive for protein and blood. Urine myoglobin was positive. Multiplex real-time RT-PCR assay performed on respiratory specimens was negative for influenza but positive for adenovirus DNA. The patient was diagnosed with Rhabdomyolysis and oliguric renal failure due to adenoviral infection after excluding all other potential etiologies.

Table 1: Laboratory Data

<table>
<thead>
<tr>
<th>Test</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
</tr>
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<tbody>
<tr>
<td>Calcium (mg/dL)</td>
<td>10.4</td>
<td>10.8</td>
<td>10.3</td>
<td>10.2</td>
<td>10.5</td>
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<tr>
<td>BUN (mmol/L)</td>
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<td>22</td>
<td>20</td>
<td>18</td>
<td>16</td>
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<td>Bicarbonate (mmol/L)</td>
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<td>Cholesterol (mg/dL)</td>
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<td>185</td>
<td>180</td>
<td>175</td>
<td>170</td>
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<tr>
<td>Triglycerides (mg/dL)</td>
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<tr>
<td>Hemoglobin (g/dL)</td>
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<td>9.0</td>
<td>9.0</td>
<td>9.0</td>
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<td>Sodium (mmol/L)</td>
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<td>124</td>
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<tr>
<td>Potassium (mmol/L)</td>
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<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Lactate (mmol/L)</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Table 2: Laboratory Data

Case Presentation

• Adenoviruses are double stranded DNA viruses belonging to the family Adenoviridae.
• An extremely hardy virus, adenovirus is ubiquitous in human and animal populations, survives long periods outside a host, and is endemic throughout the year. It is transmitted via direct inoculation to the conjunctiva, fecal-oral route, aerosolized droplets, or exposure to infected tissue or blood.
• The clinical syndromes commonly associated with adenovirus (ADV) infection, which is usually in children include: pharyngitis with or without conjunctivitis, severe and often fatal pneumonia, keratoconjunctivitis, acute hemorrhagic cystitis and asymptomatic intestinal infection.

In adults, it causes acute respiratory disease, which varies from mild, febrile pharyngitis and rhinitis to severe, fatal pneumonia and rarely encephalitis, meningitis, myositis and rhabdomyolysis.

Rhabdomyolysis is a syndrome characterized by severe muscle injury, drugs and toxins, Ischemic, inflammatory muscle injury causing elevated serum concentrations of CK-MB and myoglobin, which can lead to myoglobinuria, intravascular hemolysis, acute kidney injury and death. It is one of the most feared complications of rhabdomyolysis.

Rhabdomyolysis is a commonly encountered condition in critical care units affecting all ages, and it is the leading cause of acute renal failure in non-traumatic settings. It results in acute kidney injury from rhabdomyolysis requiring hemodialysis, but the majority recover renal function.

The incidence of acute kidney injury among hospitalized patients with rhabdomyolysis is estimated between 13% and 50%.

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Among non trauma causes infectious etiology is very rare.

However sporadic cases of infectious myoglobinuria are reported, with most common causative agent being influenza (accounting for 33 to 44% of adult cases).

Adenovirus has been implicated as a causative agent for Rhabdomyolysis only in 2 case reports, based on literature review.

This case report describes a “Severe case of Rhabdomyolysis induced renal failure requiring Hemodialysis and the patient presented with symptoms of viral conjunctivitis due to Adenovirus.”

A high index of suspicion for rare viral etiology is needed when other causes of myositis is ruled out in a patient presenting with acute febrile illness and severe rhabdomyolysis.

REFERENCES