

Acute Acyclovir Nephrotoxicity in a Patient with HIV and Herpes Zoster

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INTRODUCTION

Acyclovir is commonly used to treat herpes simplex virus (HSV) and varicella-zoster virus (VZV). The goal of treatment is to:

- promote healing of acute neuritis associated skin lesions
- decrease viral shedding
- lessen the severity and duration pain
- reduce the risk or severity of postherpetic neuralgia (1)

For HIV infected and other immunocompromised patients, the recommended dosage is 10 mg/kg/dose or 500 mg/m²/dose every 8 hours for 7 days (2). Acyclovir inhibits the replication of the herpes virus, but is also well known to cause intrarenal crystal deposition resulting in asymptomatic renal insufficiency with a peak creatinine reached in early as 3 days (3). Drug-induced kidney injury accounts for more than 2% to 15% of acute renal failure cases in patients admitted to the hospital and ICU respectively (4).

This case describes an immunocompromised patient who underwent acute renal failure within 24 hours of receiving intravenous Acyclovir for disseminated herpes zoster. It underscores that factors which predispose patients to developing acute renal failure should be considered in Acyclovir dosing and medical management.



CASE DESCRIPTION

History:

A 46-year-old man diagnosed with HIV two years prior to presentation (CD4 count of 342 and viral load of 2294) presented to the emergency room after a suicide attempt with a painful, dermatomal vesicular rash. He had been on HAART intermittently over the last year since his diagnosis with HIV. He also had history of cocaine and PCP drug abuse. He noted the rash first erupted as itchy papules and vesicles across the top of his shoulders with extension down his left arm. Over the four days prior to admission, the rash became painful and the vesicles erupted in different stages. He also noticed spreading of the rash to his face and chest during the last 2 days with associated fever, chills, and headache.

Pertinent Physical Exam findings:

Weight: 100kg
Skin: Crusting vesicular rash in different stages concentrated across both shoulders and down the left arm in a C6-C8 distribution. Vesicles and papules were also noted diffusely on the face, chest and left leg.

Pertinent Labs on Admission:

Sodium: 128
BUN: 8
Creatinine: 1.3
EGFR: 100

Patient's Progress:

On admission he was treated for disseminated herpes zoster with Acyclovir at 10mg/kg IV every eight hours. He was started on normal saline at 150ml/hr for hyponatremia with a sodium of 128. By hospital day 2, the patient's creatinine acutely increased to 5.7 and sodium decreased to 122 despite continuous volume repletion. Acyclovir was discontinued as well as Citalopram 20mg PO once daily, which was initiated on admission for depression. His fractional excretion of sodium was 2%, urinary sodium was 73 and urine osmolality was 432. Microscopic urinalysis revealed white blood cells, but no crystals. A Foley catheter was placed and normal saline was increased to 200ml/hr. Peak creatinine of 6.3 occurred on day 3 at which time sodium also began to trend up to 127.

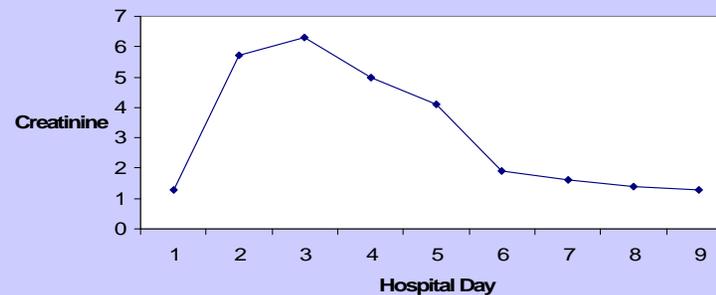
Studies:

Renal ultrasound showed no evidence of hydronephrosis, but a marked increase of the cortical parenchymal echogenicity consistent with renal medical disease, in this case AIDS nephropathy.

Outcome:

No new herpetic lesions erupted during admission. Acyclovir was not restarted and oral valacyclovir was not initiated. By discharge on hospital day 9, his creatinine returned to baseline of 1.3.

Creatinine Levels After Acyclovir Treatment



DISCUSSION

Patients with HIV are often treated with a variety of potentially nephrotoxic drugs (5). The patient described in this case had a normal creatinine for his size, but had some risk factors for developing acute renal failure including volume depletion due to insensible losses from his skin lesions and possible underlying AIDS nephropathy. The appropriate dosing of Acyclovir 10mg/kg/dose IV Q8H for this immunocompromised patient with disseminated herpes zoster was chosen. His hospital course is unique given the acute rise in his creatinine from 1.3 to 5.7 in less than 24 hours after 1 dose of Acyclovir. His renal function resolved within 9 days after aggressive hydration with IV normal saline as expected (8). He did not develop common symptoms of acyclovir toxicity such as: malaise, nausea, vomiting, anorexia, flank pain, headache, irritability, tremulousness, confusion, flushing or metallic taste (3).

CONCLUSION

Patients at risk for developing acute renal failure with acyclovir include:

- those receiving high doses of acyclovir
- bolus therapy (IV) administration
- volume depletion prior to treatment initiation
- concomitant use of other renal impairing medications
- decreased GFR from underlying kidney disease

Acute renal failure can be avoided by:

- avoiding rapid IV bolus, infusing over 1-2 hours
- adjusting dose for renal function
- establishing euvolemia before therapy

Should acute renal failure develop during the course of treatment, recommended management includes:

- discontinuing or reducing the dose of acyclovir
- establishing a high urine flow rate achieved by aggressive hydration and urine output greater than 75 ml/hr (7, 8)
- hemodialysis, last resort (4)

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