

Renal and Neurologic Toxicity Following Acyclovir Overdose

Serkalem Mekonnen, RN, BSN, MPH, CSPI¹; Maryann Amirshahi, Pharm D, MD, MPH²
¹National Capital Poison Center; ²MedStar Washington Hospital Center, Georgetown University School of Medicine



Introduction

- Acyclovir is a synthetic nucleoside analog with inhibitory activity against herpes viruses.
- Acyclovir is generally well-tolerated, even in overdose. Care is largely supportive.
- In older patients and those with underlying renal disease, acyclovir has been associated with renal and central nervous system toxicity in both therapeutic use and overdose.
- These adverse effects have not been previously described in young individuals with normal renal function.
- *Hypothesis:* Acute acyclovir overdose can result in altered mental status and renal failure in the absence of preexisting renal disease or other chronic comorbidities.

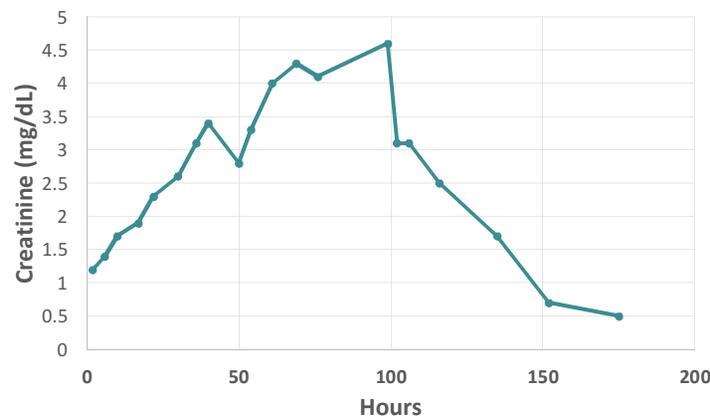
Methods

- This is a single patient chart review.
- A 23-year-old woman G2P1 at 32-weeks gestation presented to the emergency department with nausea, vomiting, fever, and single episode of hematemesis.
- She was admitted to labor and delivery for management of active genital herpes and empiric treatment for chorioamnionitis.
- Her vital signs on admission were: T 102.5° F, HR 123 BPM, BP 108/72 mm Hg, RR 20 BPM, oxygen saturation 100% on RA.
- Baseline creatinine on admission was 0.4 mg/dL.
- The patient underwent a repeat cesarean delivery because of active genital herpes.
- She was inadvertently ordered and administered 5.9 g of IV acyclovir, instead of 590 mg, which was infused over 14 hours.

Results/Case Report

- After the infusion was complete, the patient was noted to be lethargic and hypothermic (95.3° F) with a significant drop in urine output. She was subsequently transferred to the ICU.
- Within 10 hours, the patient's creatinine rose to 1.7 mg/dL.
- The patient was given IV fluids and furosemide in conjunction with nephrology consultation.
- Despite these measures, the patient remained oliguric and serum creatinine continued to rise, peaking 4 days post-exposure at 4.6 mg/dL, with evidence of fluid overload.
- Renal ultrasound was normal. Urinalysis was notable for dilute urine with 3+ blood and positive leukoesterase; urine culture grew out yeast.
- CT and MRI of the brain and cerebral spinal fluid studies were unremarkable.
- Because the patient was not responding to initial therapy, hemodialysis was initiated three days post-exposure.
- The patient underwent three daily hemodialysis sessions, with improvement in her renal function and mental status.
- Prior to discharge, she required treatment for hypertension. She was discharged on post-operative day 12 with a creatinine of 0.6 mg/dL with no neurologic deficits.

Serum Creatinine (mg/dL) by Hours Post-Exposure



Discussion/Limitations

- Acyclovir-induced renal and central nervous system toxicity are rare and generally affect the elderly and/or patients with baseline renal insufficiency or chronic comorbidities.
- At high concentrations, acyclovir precipitates as crystals in renal tubules, causing intratubular obstruction, which can lead to subsequent renal failure.
- Acyclovir-induced neurotoxicity is less well understood, but is thought to be due to an active metabolite that accumulates in the cerebral spinal fluid.
- Physiologic changes that occur during labor and delivery as well as during the intra and post-operative state may have contributed to toxicity in this individual.
- Our findings are limited in that this is a single patient case report. Additional experience is required to establish causation.

Conclusions

- This case report suggests that neurologic and renal toxicity from intravenous acyclovir overdose can occur in young individuals with normal baseline renal function.
- Although the majority of cases of acyclovir overdose do not require intervention, aggressive supportive care, particularly hemodialysis, may be indicated in critically-ill patients.

Disclosures

- The authors have no conflicts of interest or sources of funding to disclose.

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