

“Smoking” guns: Questions

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A 17-year-old male presented to the hospital following a TASER (TASER International, Inc., Scottsdale, AZ, USA) encounter and arrest by law enforcement. The patient exhibited agitation and aggressive behavior. He admitted to

smoking “synthetic marijuana” as well as taking two tablets of combination oxycodone and acetaminophen (Percocet). He complained of retrosternal and upper abdominal pain. He recently acquired a new supply of “Brain Freeze” and smoked it multiple times in the last couple of days including the day of admission. On exam he was tachycardic (heart rate 120 beats per minute) and hypertensive (151/73 mmHg). His abdomen was soft. He had mild non-localizing tenderness. He had bilateral costovertebral angle tenderness. Laboratory evaluation was remarkable for a serum bicarbonate of 8 mmol/l with an anion gap of 29; creatinine 1.7 mg/dl; potassium 3.3 mmol/l; an elevated creatinine kinase (CK) of 2,723 U/l with myoglobinemia 3974.5 ng/ml (Table 1). Urinalysis revealed a

The answers to these questions can be found at <http://dx.doi.org/10.1007/s00467-014-2983-4>.

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Table 1 Laboratory studies from the blood during the hospitalization

Investigation	Results							Reference range
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6		
Sodium (mEq/l)	138	138	140	143	143	142	141	135–145
Potassium (mEq/l)	3.8	3.8	3.2	3	4	4.7	4.4	3.3–4.9
Chloride (mEq/l)	101	110	106	101	106	108	111	100–114
Bicarbonate (mEq/l)	7.8	18	25	36	32	29	24	20–30
BUN (mg/dl)	14	18	20	24	28	26	19	9–18
Creatinine (mg/dl)	1.7	2	2.9	5	6.1	5.2	3.7	0.4–1.2
Calcium (mg/dl)	9.2	8.4	8.3	8.1	8.8	9.1	9.6	8.6–10.3
Phos (mg/dl)		7	7.4	6.5	5.6	4.5	4	3–6
Albumin (g/dl)		3.9	3.8	3.4	3.6	3.5	4.2	3.2–5
CK (U/l)	405	2723	5143	3776				<300
Uric acid (mg/dl)				17 ^a	0.7			3–8

BUN blood urea nitrogen; Phos phosphorus; CK creatine kinase

^a Treated with rasburicase

specific gravity of 1.010; pH of 6.0; 2+ protein; 2+ glucose; and 3+ blood. Urine microscopy did not identify red blood cells, casts, or crystals. A urine drug screen was positive for delta-9 tetrahydrocannabinol (THC). Renal ultrasound identified normal-sized kidneys, but increased cortical echogenicity. Additional studies including EKG, chest radiography, and chest/abdomen/pelvis computed tomography (CT) scan were normal. During 6 days of hospitalization, his blood pressures remained above the 95th percentile for age and height. He continued to experience significant nausea and emesis. Urine output remained brisk (>1.5 l per day). Blood work was performed at least daily (Table 1).

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Questions

1. What is the diagnosis?
2. What is the mechanism of acute kidney injury?
3. What laboratory study over the hospital course is not typically associated with diagnosis?
4. Is the conducted electrical weapon encounter clinically relevant?

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