A RARE CASE OF SEVERE HYPERNATREMIA INDUCED Rhabdomyolysis

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Introduction
Electrolyte abnormalities are a prominent feature of rhabdomyolysis, and some electrolyte disorders can be a cause of rhabdomyolysis. Rhabdomyolysis caused by severe hypernatremia (>160 mmol/l) was reported only in few case reports.

Case Presentation
35-year-old female with PMHx of developmental delay, blindness, and type II diabetes mellitus who presented with 5 days history of fever, fatigue, and lethargy.

. Per caregiver, patient had decreased oral intake for the duration. No vomiting or diarrhea was reported.

. On presentation, patient appeared to be severely dehydrated and was lethargic.

Physical Exam:
. VS: PR 114 BPM, BP 114/63, and Temp 37.4C
. Exam notable for inspiratory crackles, no peripheral edema. Patient did not follow command, did not open her eyes but moved readily to tactile stimuli.

Work up:
WBC 14K Sodium 190 mmol/L
Platelet 79K Potassium 3.8 mmol/L
PT/PTT Normal Creatinine 1.75 mg/dL
CPK 12,700 IU/L Blood glucose 500’s with no metabolic acidosis

Serum osmolality 425 mOsm/kg
Urine osmolality 499 mOsm/kg

Case Presentation (cont)
Hospital course:
Patient was resuscitated with IV normal saline and D5W fluids with improvement of sodium to 160 mmol/L. Blood glucose improved to 100’s-200’s after insulin administration. 2 days after admission, CPK increased to 82,000 and peaked at 174,000, accompanied by worsening renal function. Hospital course was further complicated by acute hypoxemic respiratory failure and hypovolemic shock for which patient was sedated, intubated, and put on pressors.

Discussion
Rhabdomyolysis is a life-threatening disease characterized by muscle necrosis and the release of intracellular muscle constituents into the circulation. The severity of illness ranges from asymptomatic elevations in serum muscle enzymes to severe disease associated with extreme enzyme elevations, electrolyte imbalances, and acute kidney injury. Symptoms in rhabdomyolysis includes muscle pain, weakness, decreased urine output and dark urine. Symptoms develop over hours to few days following an inciting event.

The hallmark laboratory studies are an elevation in CK and other serum muscle enzymes, electrolyte disturbance and reddish-brown urine of myoglobinuria. Common and important causes are crush injury or prolonged immobilization, toxins, hyperthermia, metabolic myelopathies and electrolyte disorder. The majority of patients have more than one etiologic factor, and less than 10 percent have no identifiable cause. Treatment approach includes recognition and management of fluid and electrolyte abnormalities and identification of the specific causes and the use of appropriate countermeasures.

Conclusion
This case demonstrated severe hypernatremia causing rhabdomyolysis, subsequently leading to multiple organ failure. The exact mechanism is unknown but thought to be due to hyperosmolar state which impairs sodium calcium transport causing an activation of protein kinases, subsequently leading to muscle lysis.