When Mountain Dew Moves Mountains: Thyrotoxic Periodic Paralysis in a Caucasian Male

Huan Pham, MD, Doha Zoarob, MD, Warsha Korani, MD, Shriram Sirsikar, MD
Department of Internal Medicine, Conemaugh Memorial Medical Center, Johnstown, PA 15905

INTRODUCTION

- Thyrotoxic Periodic Paralysis (TPP) is a rare condition, primarily seen in Asian populations, characterized by muscle paralysis, hyperthyroidism, and hypokalemia
- Early recognition and treatment are essential, as TPP can be rapidly reversed with potassium supplementation
- This case report presents a Caucasian male who developed TPP after consuming excessive amounts of Mountain Dew and performing strenuous yard work.

CASE HISTORY

- A 36-year-old Caucasian male with a history of depression (treated with sertraline) presented with severe weakness in both legs after performing yard work in hot weather
- He reported consuming seven cans of Mountain Dew that day, with little water
- On examination, he was found to have a rapid heart rate, a diffuse goiter, and mild exophthalmos.
- Lab results showed severe hypokalemia (K+ 1.1 mmol/L), metabolic acidosis, elevated lactate, acute kidney injury, and abnormal thyroid function (suppressed TSH, elevated free T4 and T3)
- EKG revealed a prolonged QTc interval (592 ms), and echocardiography showed moderate systolic dysfunction (EF 40-45%). Thyroid antibodies confirmed Graves' disease
- The patient received intravenous fluids and potassium, which led to significant improvement
- He was discharged on day three and continued treatment for Graves' disease with methimazole.

DISCUSSION

- This case highlights that TPP, although rare in non-Asian populations, can occur in Caucasians and should be considered in patients presenting with muscle weakness and hyperthyroidism
- Excessive consumption of Mountain Dew, which is high in sugar, and physical exertion likely triggered the thyrotoxic crisis in this patient
- Additionally, Mountain Dew and some other energy drinks previously included brominated vegetable oil (BVO), a substance linked to thyroid toxicity
- Historically, Mountain Dew contained brominated vegetable oil (BVO), which has been linked to thyroid dysfunction
- Although BVO was removed in 2020, this case emphasizes the need to monitor dietary triggers in patients with thyroid disorders.

Lab Results

	Test	Result	Normal Range
1	Potassium (K+)	1.1 mmol/L	3.5-5.0 mmol/L
2	Magnesium (Mg)	1.9 mmol/L	1.7-2.2 mmol/L
3	Anion Gap	21 mmol/L	8-16 mmol/L
4	Lactate	7.7 mmol/L	0.5-2.2 mmol/L
5	TSH	<0.01 uIU/mL	0.4-4.0 uIU/mL
6	Free T4	2.66 ng/dL	0.8-2.0 ng/dL
7	Free T3	9.64 pg/mL	2.3-4.2 pg/mL

CONCLUSION

- TPP should be included in the differential diagnosis of acute paralysis in hyperthyroid patients, regardless of ethnicity
- Prompt diagnosis and treatment with potassium supplementation are key to a quick recovery
- Physicians should be aware of potential dietary and environmental triggers, such as high-sugar beverages, in precipitating thyrotoxic crises.

References:
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