

## Case Report

# Soft Drinks: Are they Really Soft?

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### ABSTRACT

We report a case of epileptic seizures following heavy consumption of a cola and caffeine containing soft drink. The probable cause for seizures could be due to a combination of hyponatraemia, water intoxication, and high dose of caffeine and aspartame from the soft drink.

**Key Words:** Soft drink, Caffeine, Aspartame, Hyponatraemia, Water intoxication, Seizures

### Introduction

Soft drinks are popular among the youth, and this desire for consuming them is fuelled by aggressive marketing campaigns featuring celebrities and sportspersons. A culture of blogs, urban legends, and “underground” chic has further increased their appeal. The wide availability of these beverages from grocery stores, convenience stores, and even school bookstores makes them readily accessible for purchase by children, adolescents, and young adults. We report a case of a patient who presented with seizures after heavy consumption of a soft drink containing cola, caffeine, and aspartame (Diet Coke®).

### The Case

A 23 year-old engineering college student was brought to the emergency room of the hospital with history of two episodes of generalized tonic-clonic seizures. There

was no history of trauma, alcohol intake, or poisoning. His medical history was otherwise not significant.

On examination, the patient was in post-ictal state, with GCS of 10/15, and the pupils appeared normal in size, equally reacting to light. Auscultation revealed normal heart sounds, without evidence of any murmur or gallop. The lungs were clear. Central nervous examination revealed increased tone in all four limbs, brisk deep tendon reflexes, and bilateral up-going plantars. Meningeal signs were absent. His vitals were stable, capillary blood glucose, arterial blood gases and ECG were essentially normal. A provisional diagnosis of unknown seizure-disorder was made. A subsequent CT scan of the brain was normal.

The patient was shifted to the intensive care unit for further management. In the ICU, he had another episode of seizure which lasted for 2 min; he was administered diazepam and an antiepileptic drug. His haematological and biochemical values were within normal limits, except for severe hyponatraemia (106 mEq/dL). The patient was then administered 3% saline. His sensorium improved thereafter, following the sodium correction and supportive measures.

On interrogation after his condition stabilized, the patient admitted that he had taken 25 cans (350 mL X 25 = 8750

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mL) of 'Diet Coke®' on an empty stomach within a period of 8 hours to win a wager among his friends. A diagnosis of hyponatraemia-induced seizures was then made.

### Discussion

Adult-onset seizures which develop abruptly can be due to a number of reasons, including trauma, drug abuse, CNS infections, CNS lesions, electrolyte abnormalities (hyponatraemia, hypocalcaemia, hypomagnesaemia), and cerebral stroke. In some cases, trauma in the past or prior febrile seizures could lead to new-onset seizures. In the clinical setting, these causes of seizures can be identified by neurological examination, laboratory tests, and imaging studies.

The fact that the patient in this case had confessed to an excessive intake of Diet Coke® immediately gave rise to the suspicion of hyponatraemia as the cause of seizures, as it is a relatively well known factor.<sup>1,2</sup> Caffeine and cola in Diet Coke® can induce or exacerbate seizures, especially when taken in high doses.<sup>3</sup> Aspartame, a sweetener used in Diet Coke®, is also known for its epileptogenic potential.<sup>4</sup> Caffeine-induced seizures following intraperitoneal administration of caffeine has been documented in rats.<sup>5</sup> The role of caffeine in causing adverse CNS effects is a well known fact.<sup>6</sup> In humans, several cases of seizures have been documented following caffeine overdose,<sup>7</sup> and after ingestion of medications containing large amounts of caffeine.<sup>8</sup> In patients with epilepsy, it is known that excessive caffeine lowers the seizure threshold.<sup>9</sup>

In this case, the patient did not develop seizures when he consumed small volumes of these drinks, which suggests that these stimulant drinks have a dose-dependent effect. In addition, when large volumes are consumed on an empty stomach, rapid absorption takes place, which increases the risk of adverse effects.

Further study is needed to evaluate the accurate CNS effects and mechanisms of action of these popular stimulant beverages, and how genetic makeup may contribute to susceptibility. While evaluating adult patients with new-onset seizures, clinicians should question the patients about their use of herbal supplements, beverages (alcoholic and non-alcoholic), diet pills, as also beverages containing methylxanthines such as tea, coffee, and cocoa.<sup>10</sup> Public awareness of health-related issues associated with these drinks should be created, if the frequency of cases increase.

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