Introduction

Hypothermia is a condition in which the core body temperature is decreased to below 35°C (95°F; Table 1).

There are multiple causes for hypothermia (Table 2) including malnutrition from chronic diseases, liver disease, alcohol use, and cold exposure.

Case Presentation

A 45 year old Hispanic gentleman was brought to our facility after being found lying outside on a sidewalk.

According to EMS reports, the patient initially had a blood pressure of 106/60 with a pulse of 48, respirations of 18, 100% oxygen saturation on room air, a blood glucose level of 125, and had admitted to alcohol use that day.

Upon arrival to our facility, he was found to have a core body temperature of 84.2°F.

The patient was drowsy but arousable. He spoke but did not answer questions appropriately. He did not have any evidence of head trauma and pupils were sluggish but reactive to light, otherwise his physical exam was unremarkable.

Initial laboratory studies revealed hemoglobin of 11.7 gm/dL and an MCV of 111.2 fL.

Toxicology screen was negative.

EKG changes were consistent with Osborn waves seen with hypothermia (FIGURE 1).

Blood, urine, and sputum cultures were obtained to evaluate for possible sepsis as the cause of the patient’s hypothermia.

He was started on broad spectrum antibiotic therapy.

TSH was normal and both random and 8:00am cortisol levels were not depressed. He had a normal vitamin B12 level and a borderline deficient folate level.

The patients’ hypothermia was gradually corrected with active external re-warming techniques.

After 12 hours of monitoring in the ICU his core body temperature reached 96°F.

Further history was then able to be obtained and it was learned that the patient was infected with HIV.

An immunodeficiency panel was checked revealing an absolute CD4 count of 2 cells/µL.

Thiamine deficiency was supported by a thiamine level of 22 ug/L.

The patient was discharged with thiamine and folate supplementation.

Discussion

The moderate hypothermia observed in our patient is most likely secondary to thiamine deficiency secondary to multiple etiologies including his malnourished state, AIDS and alcohol abuse.

Thiamine deficiency is a known cause of hypothermia and plays a role in the progression of HIV infection (Figure 2).

Dysregulation at the level of the hypothalamus is specifically responsible for the hypothermia (Figure 3).

Factors such as alcohol, malnutrition and chronic diseases may result in thiamine deficiency.

Thiamine is an essential cofactor for many enzymatic reactions that occur in the hypothalamus.

Thiamine deficiency causes hypothalamic dysregulation.

Currently, there are no recommendations for administration of thiamine to patients with hypothermia.

References

Luo'sing KVO and Nguyen LTH. The Role of Thiamine in HIV Infection. International Journal of Infectious Diseases, Volume 17, Issue 4, 2013, e221 - e227

Schattner A and Kedar A. An unlikely culprit—the many guises of thiamine deficiency. Am j Emerg Med. 31, 2013, 635.e5 – 635.e6