



NONCIRRHOTIC HYPERAMMONEMIA CAUSING RELAPSING ALTERED MENTAL STATUS

Aamir Malik*, Neha Sharma, Mariya Manzoor, Ulfat Majeed and Qaiser Manzoor

India.

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Corresponding author: Aamir Malik

India.

ABSTRACT

Hyperammonemia is a recognized cause of encephalopathy. However, it is commonly seen in patients with liver disease. We report a man who presented to our hospital with altered mental status later diagnosed as noncirrhotic hyperammonemia.

KEYWORDS: Encephalopathy, hyperammonemia, noncirrhotic.

INTRODUCTION

One of the most common causes of emergency room presentation is an acute or progressive deterioration in mental status. Careful history, physical examination, and some basic investigation may suggest the cause. The syndrome of noncirrhotic or nonhepatic hyperammonemia, by which we mean raised blood ammonia levels in the setting of normal liver function, is an increasingly recognized and reported cause of altered mental status.

CASE REPORT

A 57 yr old hypertensive male presented to our casualty with chief complaints of altered sensorium about 2 days duration in the form of irritability, agitation and unable to recognise family members. There was no history of fever headache vomiting abnormal body movements. His appetite was normal, although he was constipated for last two days drug history was telmisartan plus metaprolol. general physical examination included pulse of 74bpm,bp of 140/80,tempt of 97.7°F and oxygen saturation of 97%on room airbaseline investigations like cbc kft blood sugar sodium potassium Abg calcium cxr were within normal limits. Usg abdomen, ncct head, csf studies and eeg were also normal. The differential diagnosis was expanded, and we checked urine toxicology studies, antinuclear antibody, serum vitamin B12, thyroid-stimulating hormone and serum thiamine; all were within normal limits.

The serum ammonia level was 102 umol/L (normal, 10–40 umol/L). The patient was treated with lactulose

enema, and within 1 hour his mental status improved dramatically. He had no recollection of the prior events. Repeat serum ammonia estimation after about 12 hours was 49 umol/L. He remained at his baseline for a further 48 hours and was discharged home with the addition of lactulose to his home medications. He continues to follow up. In our patient, the elevated blood ammonia level and the rapid resolution of symptoms coupled with the reduction of his blood ammonia level led us to suspect that hyperammonemia may have accounted for his presentation. His clinical presentation and subsequent clinical course were similar to those of patients described in prior case reports of noncirrhotic/nonhepatic hyperammonemia.

The exact cause of hyperammonemia in our patient was not certain.

DISCUSSION

Noncirrhotic hyperammonemia as a cause of altered mental status remains a diagnosis of exclusion. Hyperammonemia refers to an increase in the level of ammonia in the blood. Ammonia in humans is generated by bacterial hydrolysis of urea and other nitrogenous compounds in the intestine, the purine nucleotide cycle, and amino acid transamination in skeletal muscle and other metabolic processes in the kidneys and the liver. If ammonia accumulates in the blood, it can cross the blood-brain barrier and result in the neurological disorders associated with hyperammonemia. Primary causes of hyperammonemia include congenital enzymopathies in the urea cycle, such as deficiencies of

ornithine transcarbamoylase and argininosuccinate lyase. These disorders can lead to varying degrees of hyperammonemia depending on the enzyme affected and on whether the genetic deficiency is heterozygous or homozygous. Secondary hyperammonemia occurs commonly in the presence of hepatic disorders leading to portosystemic encephalopathy, but can occur in the absence of hepatic dysfunction in disorders like Reye's syndrome, ureterosigmoidostomy, and infection in a neurogenic bladder. Drug toxicity as a result of disruption of mitochondrial pathways by drugs like cyanide, carbamazepine, valproic acid, iron, and cytotoxics can also cause secondary hyperammonemia, and this is thought to be the main mechanism by which nonhepatic or noncirrhotic hyperammonemia can occur in people exposed to these drugs.

CONCLUSION

The diagnosis of hyperammonemia may be challenging and requires a high index of suspicion. However, it should be considered when a clear cause of altered mental status is not obvious after basic investigations. As an initial step, it is advisable to exclude hypo- or hyperglycemia, azotemia, liver failure, electrolyte imbalance, sepsis, structural and vascular pathologies like stroke, and central nervous system involvement by cancers. Thereafter, the evaluation can be expanded to consider less common etiologies.

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