Common Variable Immunodeficiency with Angiosarcoma Associated with Hyperammonemia Secondary to High Dose IVIG Infusion

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ABSTRACT

Common Variable Immunodeficiency (CVID) is the most common symptomatic immunodeficiency, marked by a humoral deficiency and recurrent respiratory tract infections. It can be treated with regular immunoglobulin (Ig) replacement therapy. Each polypeptide chain is composed of 400 amino acids. Amino acids are rich in nitrogen, which are metabolized to ammonia. Each immunoglobulin monomer consists of four polypeptide chains, two heavy chain and two light chains connected by disulfide bonds. Each polypeptide chain is composed of 400-500 amino acids. Amino acids are rich in nitrogen, which are metabolized to ammonia.

The patient is a 74 year old, Caucasian male with a past medical history of hyperammonemia, dysproteinemia, coronary artery disease status post multiple stent placements, colon cancer status post colonic resection, benign prostatic hyperplasia, osteoarthritis, cerebrovascular accident presented to the ED with 2 days of decreased appetite and generalized weakness. He was admitted with working diagnoses of non-ST elevation myocardial infarction (NSTEMI) and urinary tract infection. On day 3 of admission, the patient became progressively confused and lethargic. Subsequently, a CT and MRI of the brain were performed and a central nervous system infection was not likely after cerebral spinal fluid was negative for bacteria. Fungus including Cryptococcus, HIV, H1V, and toxoplasmosis. On day 5 of admission, he was only arousable to sternal rub and was transferred to the ICU.

Due to the prolonged hospital stay, the patient’s scheduled IVIG transfusion was delayed by a week after the IgG level was found to be 1340umol/L at post infusion day 7.

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In the case of our patient, his newly diagnosed hepatic angiosarcoma was confirmed after tissues collected from CT guided core needle biopsy was stained positive for CD34 marker, indicating that the neoplastic cells are of endothelial cells/vascular origin. His ability to metabolize proteins, including his IVIG, to urea was compromised by his neoplasm in his liver.

From the our patient’s course of diagnosis of the hepatic angiosarcoma and its correlation to his acute progressive encephalopathy due to hyperammonemia, we concluded that:

- Patients who receive high dose immunoglobulin infusion may be at increased risk of hyperammonemia, especially in the setting of compromised liver function.
- Patients with liver pathology, such as a hepatic neoplasm, can decrease their ability to metabolize proteins and may result in increased ammonia level, which may present clinically as acute encephalopathy.
- Clinicians should consider making adjustments to the dosage of immunoglobulin infusion or injection of large amount to protein products patients with underlying liver pathology.
- In patients with underlying liver pathology who receive high dose IVIG, clinicians should consider prescribing lactulose prophylactically to prevent hyperammonemia.

HOSPITAL COURSE

PATH REPORT

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INTRODUCTION

Common Variable Immunodeficiency (CVID) is the most common symptomatic immune deficiency. Patients with CVID are often managed with repetitive, life-long immunoglobulin (Ig) replacement therapy. Although immunoglobulin replacement decreases the rate of infections, it has not been shown to decrease the rate of chronic lung disease, systemic granulomatous disease, gastrointestinal disease, lymphoma and development of cancer. Patient who receive intravenous immunoglobulin (IVIG) commonly experience many transient post-infusion adverse reactions such as headaches, flushing, malaise, fevers, chills, etc.

Encephalopathy secondary to hyperammonemia has never been reported after an IVIG infusion. We report a case of a 74 year old male with CVID, receiving biweekly high dose IVIG found to have hyperammonemia-induced encephalopathy associated with newly diagnosed liver angiosarcoma. The hepatic angiosarcoma compromised his ability to convert the ammonia, from his IVIG, to urea, resulting in encephalopathy.