

PULSE Abstract – The Role of Polyethylene Glycol 3350 in Hepatic Encephalopathy

Hepatic encephalopathy is a spectrum of neuropsychiatric abnormalities that occur as the result of both chronic and acute liver dysfunction. When present in both disease states, it is associated with poor prognosis and higher costs to the health care system. Hepatic encephalopathy is classified based on underlying disease, severity of manifestation, time course, and existence of precipitating factors. While the pathophysiology is not fully understood, ammonia is thought to play a key role in the development of hepatic encephalopathy. Lactulose is commonly used to treat hepatic encephalopathy by helping to lower ammonia levels in the body by multiple different proposed mechanisms including excretion via feces. It has been postulated that another laxative, polyethylene glycol, may work better to lower ammonia levels in this disorder due to its more powerful cathartic effects. Polyethylene glycol electrolyte solution has been studied at larger doses of two to four liters (236 grams to 472 grams) in cirrhotic patients presenting with hepatic encephalopathy. When compared to lactulose alone, polyethylene glycol resulted in a larger change in grade of hepatic encephalopathy at 24 hours without a significant difference in side effects and electrolyte abnormalities in patients with cirrhosis. No literature is currently published regarding the use of polyethylene glycol at lower doses or in patients with acute liver failure.

Refer to this case to answer the Assessment Questions:

JD is a 65-year-old male presenting to the ED with altered mental status, abdominal pain, and black tarry stools. His past medical history includes HTN, T2DM, and recent diagnosis of cirrhosis in the past 6 months. In the ED, he is disoriented to time but oriented to space and displaying symptoms of asterixis. His home medication list and labs upon presentation are as follows:

Meds:

- Empagliflozin 10 mg once daily
- Lisinopril 20 mg once daily

Labs:

- A1c: 6.2%
- AST: 70 IU/L
- ALT: 120 IU/L
- Hgb: 6.8 g/dL
- HCT: 23.2%
- Total Bilirubin: 4.6 mg/dL
- INR: 1.8

Vitals:

- BP: 102/54
- Afebrile

CT Abdomen/Pelvis: Upper GI Bleed

Question 1:

How would you classify JD's hepatic encephalopathy?

- A. Type A, Grade II (Overt), episodic, precipitated
- B. Type C, Grade IV (Overt), episodic, precipitated
- C. Type C, Grade II (Overt), episodic, precipitated
- D. Type C, Grade I (Covert), recurrent, spontaneous

Question 2:

For JD, who presents with Type C, Grade II, precipitated and episodic hepatic encephalopathy, which of the following is an appropriate treatment option?

- A. Rifaximin 550 mg by mouth twice daily alone
- B. Diphenoxylate hydrochloride 5 mg four times daily
- C. Treat precipitating factor(s)
- D. Lactulose 20g/30mL every 2 hours until bowel movement then given 2 to 4 times per day at a dose needed to achieve 2 – 3 soft stools/day
- E. Both C and D

Questions 3:

Which of the following dosing regimens of polyethylene glycol should be used for a cirrhotic patient presenting to the emergency department with grade II hepatic encephalopathy?

- A. Polyethylene glycol electrolyte solution 2 liters by mouth every 12 hours for 2 doses
- B. Polyethylene glycol electrolyte solution 4 liters nasogastric given over 4 hours
- C. Polyethylene glycol 17 gm three times per day
- D. Both A and B

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