

To Compare the Effect of Polyethylene Glycol vs. Lactulose in the Treatment of Overt Hepatic Encephalopathy

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ABSTRACT

Introduction: Hepatic Encephalopathy is one of the most common causes of hospitalization for cirrhotic patients. Lactulose has long been used as the standard therapy for the treatment of acute HE. This study evaluated the efficacy of PEG as compared with lactulose for the initial treatment of HE. **Aims and Objective:** To compare efficacy of PEG 3350 electrolyte solution over lactulose in patients admitted for hepatic encephalopathy. To determine whether treatment with PEG will reduce duration of hospital stay, and whether PEG can be an effective additional treatment option for HE. **Material and methods:** This prospective, randomized, comparative study was conducted in the Department of Gastroenterology Medical Trust hospital, Kochi–Kerala India, over a period of two year from May 2015–April 2017 following its approval by the Institutional ethical committee. 50 patients with cirrhosis and altered mental status attributed to HE were randomized to a standard lactulose protocol or a PEG protocol (25 in each group). **Interventions:** Patients in the PEG group (n=25) received 2 L of PEG orally or via NG tube as a single dose over 4 hours. Patients in the lactulose group (n=25) received 20-30 g lactulose orally or via NG tube for 3 or more doses over 24 hours, or a single dose of 200 g lactulose via rectal tube. Grade of HE was determined prior to treatment and again at 24 hours using the Hepatic Encephalopathy Scoring Algorithm (HESA). After 24 hours, all patients received lactulose per the standard of care. **Main outcomes and measures:** The primary end point was an improvement of 1 or more in HE grade at 24 hours, determined using the

Hepatic Encephalopathy Scoring Algorithm (HESA), ranging from 0 (normal clinical and neuropsychological assessments) to 4 (coma). Secondary outcomes included time to HE resolution and overall length of stay. **Results:** In our study, the gender distribution among two study groups showed a male predominant. Majority of HE patients were found in age group of 55-64 years. The most common underlying etiology of Liver Cirrhosis was Alcoholic liver disease 70%, Cryptogenic 14%, followed by Hepatitis C. The most common precipitant for Hepatic encephalopathy was GI Bleeding, followed by Constipation and Sepsis. The two groups were comparable in terms of baseline laboratory parameters. All patients were of Child Turcot Pugh (CTP) class C, with a Mean MELD score of 19.08 ± 2.23 in PEG group vs. 18.76 ± 2.36 in Lactulose group (p-value=0.625, NS). Majority of the patients were in grade 3 encephalopathy 58% (29/50), followed by grade 2 in 32% (16/50) at the time of presentation. A significant difference was seen between two groups in terms of mean change in grade of encephalopathy (HESA score) after 24 hours of therapy, with 1.00 ± 1.04 in PEG group compared to 1.76 ± 0.87 in lactulose group, with a significant p

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Hepatic Encephalopathy (HE) is a serious but potentially reversible disorder with a wide spectrum of neuropsychiatric abnormalities and motor disturbances that range from mild alteration of cognitive and motor function to coma and death It is a challenging complication of advanced liver disease and is estimated to occur in 30% to 45% of patients with liver cirrhosis and in 10% – 50% of patients with transjugular intrahepatic portosystemic shunts HE is often a serious sequela of chronic liver disease with significant morbidity, mortality and healthcare costs. In the United States HE accounts for 22,931 hospitalizations with an average stay of 8.5 days and a total cost of \$64,108 per case Lactulose (beta-1, 4-galactosido-fructose) has been the standard of care for management of Hepatic encephalopathy for decades . Lactulose is a non-absorbable synthetic disaccharide that consists of galactose and fructose linked by bond resistant to lactase. Lactulose is not absorbed by the small intestine but undergoes fermentation in the colon to yield short chain fatty acid, carbon dioxide, and hydrogen, with consequent lowering of fecal PH. The mechanism of action of lactulose is multifactorial and is postulated to be the trapping of ammonium ions in the gut by organic acids released after bacteria metabolize lactulose or the removal of ammoniogenic organisms and/or replacement of these species with acidophilic bacteria lacking urease Others have suggested that inhibition of intestinal glutamine uptake and subsequent decreased ammonia genesis plays a role. Polyethylene Glycol (PEG) is an iso-osmotic

laxative that is metabolically inert and able to bind water molecules, thereby increasing intraluminal water retention. PEG is not metabolized by colonic bacteria. Ingestion of PEG leads to an increase in stool volume and softer stools, which may become liquid depending on the volume of PEG consumed PEG is being studied for the treatment of hepatic encephalopathy in patients with cir-rhosis and limited research has shown positive effects There are very few studies comparing lactulose and PEG in HE, and Indian data on this

Keywords

Hepatic encephalopathy; PEG; Lactulose; HESA