INTRODUCTION

Background

Hepatic encephalopathy (HE) is a common complication of decompensated cirrhosis, affecting 40-50% of patients with cirrhosis and 25,000 patients annually.1,2 Due to its high incidence, HE is a condition seen and managed by internists, subspecialists, and surgeons. There are numerous known factors that can precipitate episodes of HE in patients with cirrhosis, such as gastrointestinal bleeds, infections, changes in stool consistency, and medications.3 As such, due to the variety of changes and events that occur while patients are hospitalized, HE is a common hospital complication. A routine reason for admission in patients with cirrhosis (as well as for patients in the general population) is recovery after a surgical procedure. Although many postoperative periods are uncomfortable and patients are discharged on time, complications that arise negatively affect patient outcomes and prolong their hospital stay.

Hepatic encephalopathy can be a complication that affects surgical patients’ postoperative courses, and it is likely that the nature of surgery and postoperative management places patients at an increased risk of developing HE.

Hypothesis

In postoperative patients with cirrhosis, we hypothesize that many aspects of the postoperative period differ from the patients’ baselines, whether it be energy expenditure for healing, medication changes (antibiotics, analgesics, sedatives, etc.), postoperative ileus, or activity level, and these changes may precipitate episodes of HE.

Furthermore, we hypothesize that differences in postoperative patient management, such as lactulose dosing and marocel prescription, may contribute to differences in patient outcomes.

OBJECTIVES

Aims

The aims of this project are to:

- Determine the incidence of postoperative HE development in patients with cirrhosis undergoing non-liver surgeries,
- Determine the timing and dose of lactulose administration, whether it be preoperatively or postoperatively, that is associated with a lower likelihood of developing HE in these patients,
- Determine factors associated with development of HE postoperatively in patients with cirrhosis undergoing non-liver surgeries, and
- Determine differences in length of stay amongst patients who do and do not develop postoperative HE.

METHODS

Study Design

Population: Patients 18 years and older with cirrhosis admitted to Michigan Medicine between 01/01/2009 and 01/01/2019 for postoperative recovery after surgery.

Patients will be excluded if they are undergoing a liver-related surgery, such as liver transplantation, liver resection, ablation of any portion of the liver, transjugular intrahepatic portosystemic shunt placement, or operations that modify the biliary tree.

Data Collected

Baseline Information
- Demographics: age, sex, race/ethnicity, body mass index (BMI)
- Laboratory tests: AST, ALT, alkaline phosphatase, albumin, total bilirubin, creatinine, CBC, CRP
- Medications: home medications
- Pre- and Postoperative Information
  - Medications: inpatient medications and changes to medications while admitted, HE-related therapies (lactulose, rifaximin, etc.)
  - Type of surgery performed
  - Onset of HE: description from clinician notes

Data Regarding Clinical Status of Liver Disease
- Disease severity: MELD, CCI, ASA classification
- Exposure: history of ascites, history of hepatic encephalopathy, prior TIPS procedure, history of varices

Definitions

Cirrhosis
- Historical biopsy showing cirrhosis at any time in the past
- Clinical decompensation
- Imaging showing a cirrhotic-appearing liver with associated signs of portal hypertension including splenomegaly, varices, or thrombocytopenia (platelet <100k in the absence of other causes)

Hepatic Encephalopathy (HE)
- Altered mentation
- Reversible with lactulose
- Documented in MChart

Outcome Measures
- Incidence of HE amongst postoperative patients
- Timing and dose of lactulose associated with a lower likelihood of developing HE
- Factors associated with developing HE in this patient population
- Length of stay of patients who develop HE versus patients who do not

RESULTS

While still undergoing analysis, of the 580 patients that met criteria for the study, 40 (6.9%) developed HE postoperatively. Patients who developed HE tended to have a longer length of stay, higher in-hospital mortality, and higher preoperative Charlson Comorbidity Index and Mayo 30-day mortality risk.

CONCLUSIONS

The incidence of postoperative HE, at least within this health system, was determined over the past decade.

Further conclusions are forthcoming as the rest of data undergoes analysis.

LIMITATIONS

This study was performed with a single health system’s population, limiting its generalizability to the larger population.

Other factors may also contribute to the differences in lengths of stay, in-hospital mortality, and other outcomes.

In the 10-year period, the number of patients that developed HE was on the lower end for statistical analysis, but many calculations are still able to be carried out.

LESSONS LEARNED

Starting this research study from beginning (drafting the IRB) to performing data extraction and analysis, and now moving into the stage where a manuscript will be drafted has been an enriching experience. I was not prepared for how much time data collection for an initial patient population of more than 1000 would require, but now that it has been completed, we are ready to complete the data analysis. To continue to propel the project forward, we will draft the manuscript, submit it for publication, and begin any interventions/changes we realize from the data analysis. For future students considering a retrospective chart review project, I would highly recommend leveraging the power of two university resources – Data Direct and EMERGE – both of which were incredibly handy for a targeted chart review with many variables.

DISCLOSURES

The authors have no disclosures to report.

REFERENCES