

Will Implementation of Nutrition Services Consult Protocol Improve Outcomes of Patients with Cirrhosis Admitted to GSRMC?



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ABSTRACT

In this QI project, we aimed to reduce the length of hospital stay and complications experienced by patients with cirrhosis by implementing a Best Practice Advisory (BPA) in Epic to recommend a consult to nutrition services. Nutrition services would then follow a protocol including treatment of malnutrition and avoidance of fasting. Secondary outcomes included 30-day mortality and 30-day readmission rates. Hospital encounters of interest were identified via Epic Reporting Workbench reports, then study investigators manually reviewed each encounter to determine eligibility and collect outcome data. The pre-intervention timeframe was April through October 2018, and post-intervention was April through September 2019. Data showed there was no statistically significant difference in length of stay, 30-day readmission, or 30-day mortality. In part, this was thought to be most strongly related to limited utilization of the BPA.

INTRODUCTION

According to the CDC, there are about 4.5 million adults in the United States who are diagnosed with liver disease or cirrhosis [1]. Cirrhosis is defined as a late stage of fibrosis of the liver that may be secondary to several different etiologies such as chronic alcohol consumption or non-alcoholic fatty liver disease. The intrinsic functional integrity of the liver is important for metabolism of nutrients including proteins, carbohydrates, and lipids and is often disrupted in patients with cirrhosis. The pathogenesis of the malnutrition in cirrhotic patients is multifactorial including reduced dietary intake with macro- and micronutrient deficiencies, propensity for entering catabolic state, and impaired absorption [2].

Cirrhosis also frequently involves a multitude of complications. For example, hepatic encephalopathy encompasses a spectrum of neuropsychiatric manifestations in about 30-45% of patients with cirrhosis [3] and, of those, approximately 75% of patients with hepatic encephalopathy suffer from moderate to severe protein-calorie malnutrition (PCM). The presence of hepatic encephalopathy is a risk factor for increased complications including esophageal varices, ascites, and neuropsychiatric involvement [4].

Prior to this quality improvement project, the frequency of nutrition services consultations was inconsistent which raised concern that nutrition services was not being effectively utilized to diagnose and treat nutritional deficiencies in patients with cirrhosis. The goal of this quality improvement project was to reduce the length of stay by 20% in hospitalized patients with cirrhosis with early nutritional interventions through nutrition services consultation.

ICD-10 Code	Diagnosis
K70.30	Alcoholic cirrhosis without ascites
K70.31	Alcoholic cirrhosis with ascites
K70.40	Alcoholic hepatic failure without coma
K70.41	Alcoholic hepatic failure with coma
K70.9	Alcoholic liver disease, unspecified
K74.3	Primary biliary cirrhosis
K74.4	Secondary biliary cirrhosis
K74.5	Biliary cirrhosis, unspecified
K74.60	Unspecified cirrhosis of liver
K74.69	Other cirrhosis of liver

METHODS

Cross-sectional study of outcomes of patients with cirrhosis admitted to Good Samaritan Regional Medical Center before and after implementation of Best Practice Advisory (BPA) to prompt an inpatient consult to nutrition services for patients with cirrhosis. The BPA was designed to trigger for patients that included diagnoses related to cirrhosis (Table 1) on their problem list. An evidence-based nutrition protocol was designed for dietitians to follow in patients with cirrhosis upon consultation. The protocol included evaluating for malnutrition, providing individualized nutrition therapy based on recommended protein, calorie, and salt intake, ordering a bedtime snack, and recommending dietary supplements when indicated. Data was collected for six months before the intervention (April thru Sept 2018) and six months after the intervention (April thru Sept 2019). Patient encounters that were outpatient procedures or emergency department visits were excluded. The primary outcomes were length of stay, 30-day readmission rate, 30-day mortality rate, and number of nutrition services consults. The secondary outcome was the number of new diagnoses of severe or moderate protein-calorie malnutrition.

RESULTS

- A total of 202 hospital admissions were included in the pre-intervention group, and 183 were included in the post
- Approximately half of eligible patients received a RD consultation (53% pre and 55% post)
- There were no significant changes in length of stay, mortality, or readmission rates from pre to post intervention, and no significant change in the percent of patients with a RD consult ordered or completed (Table 2).
- Post-intervention, of the patients with a moderate or severe malnutrition diagnoses (Figure 1), 76% were new diagnoses (diagnosed during the admission) and 24% were previous diagnoses (had been diagnosed prior to the admission)

Table 2. Patient characteristics and outcomes pre vs post intervention

	Pre-Intervention (N=202)	Post-Intervention (N=183)	P-value
Sex			
Male	48% (97)	65% (119)	0.001
Female	52% (105)	35% (64)	
Average age at admission (SD)	63.5 (10)	62.7 (10)	0.4
Min, Max	32, 90	33, 87	
RD Consult Ordered	54% (109)	50% (92)	0.5
RD Consult Completed	53% (107)	55% (100)	0.8
Average hospital LOS (SD)	5.5 (6.2)	5.4 (7.6)	0.8
Min, Max	0, 43	0, 78	
30-day mortality rate	9% (19)	15% (28)	0.1
30-day readmission rate	22% (45)	21% (39)	0.9

Figure 1: Malnutrition Diagnosis Severity

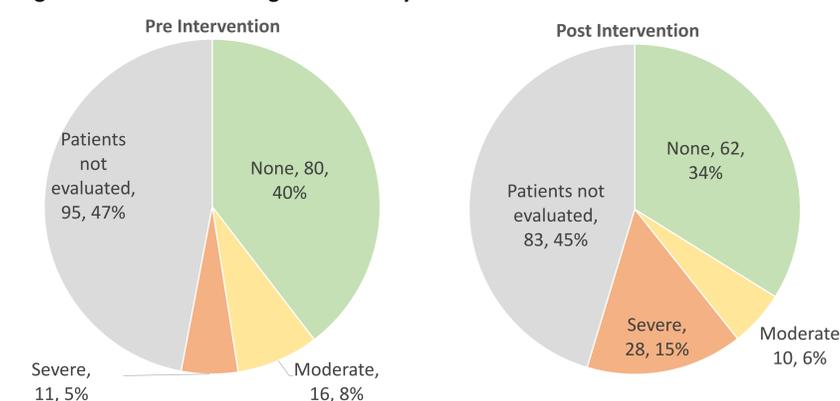


Figure 2. Mortality and readmission rates pre vs post intervention

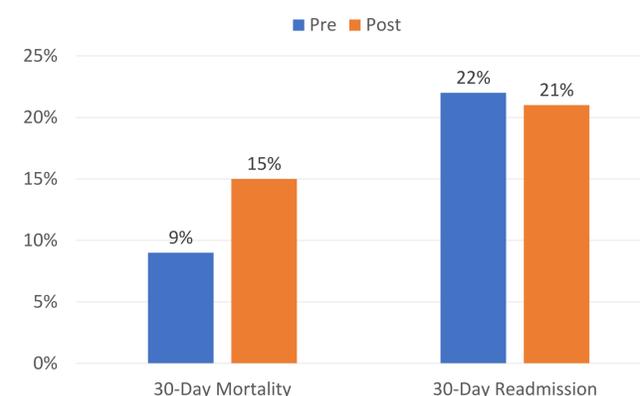
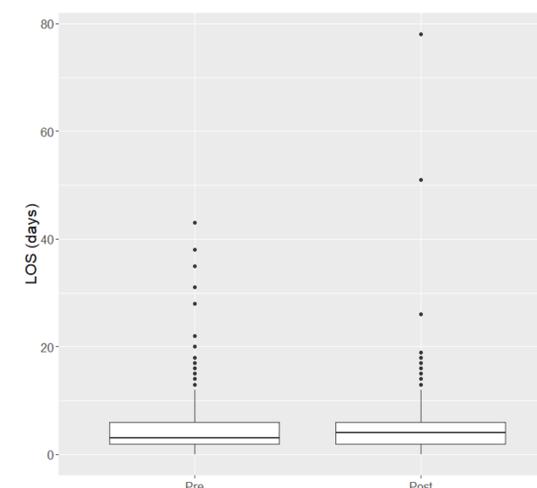


Figure 3. Boxplot of hospital LOS (in days) pre vs post intervention



CONCLUSION

- The reason there was no difference in the measured patient outcomes at GSRMC was multifactorial
- Only about half of admitted patients with cirrhosis were evaluated by a registered dietitian both before and after the BPA
- The sub-optimal frequency of consultations possibly from lack of awareness of the indication for nutrition services consult for patients with cirrhosis, time constraints on practitioners, "BPA fatigue", and that questions related to cirrhosis not included in nursing admission assessment questionnaire
- Nonetheless, involvement of nutrition services for early diagnosis of protein-calorie malnutrition and nutritional interventions may still have a role at GSRMC in improving long-term clinical outcomes for patients with cirrhosis that was not studied in this project

NEXT STEPS

- To eliminate need for BPA and consult, create a report in EMR that generates a dynamic list of patients currently admitted that have cirrhosis that can be accessed directly by nutrition services
- Collect data on incidence of complications of cirrhosis such as spontaneous bacterial peritonitis and hepatic encephalopathy pre- and post-intervention

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