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Can Quality of Care for Patients with Cirrhosis be Measured?

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Abstract

The ultimate goal of measuring quality of care is to discriminate between healthcare providers in order to motivate improvement. Recently, a set of evidence-based indicators has been proposed to measure processes of care for patients with cirrhosis, such as early endoscopy for variceal bleeding. The aim of this study was to determine whether these indicators can be measured in a reliable and automated fashion in routine practice. We applied the top five indicators, based on agreement from a panel of experts, to hospitalized adults at our institution over a three-year period. Only two of the indicators could be reliably measured based on the published wording, and these two still required physician chart review. After applying some assumptions, the indicators were met in 46%–100% of cases. None of the indicators were linked to a single physician or institution in all cases, and none occurred with sufficient frequency to discriminate quality between providers. In conclusion, measuring quality of care in cirrhosis is a laudable goal, but current indicators are not yet ready for administrative use.

Keywords

Cirrhosis; quality indicators; ascites; spontaneous bacterial peritonitis; esophageal varices

Introduction

In complex chronic diseases such as cirrhosis, physician compensation is all too often tied to the volume of services provided rather than the quality of those services⁽¹⁾. This quality has been shown in numerous studies to be suboptimal relative to published guidelines. For example, in one study only 65% of providers recommended antibiotic prophylaxis in patients with prior spontaneous bacterial peritonitis (SBP)⁽²⁾. In another study, secondary prophylaxis of variceal bleeding was not performed in 35% of patients after an initial variceal bleed⁽³⁾. As few as 6%–22% of patients with known grade II–III varices received primary prophylaxis with β -blockers^(4, 5). Rates of screening for hepatocellular carcinoma also seem to be very low, at 16%–28%⁽⁶⁾.

In response to this problem, Kanwal et al. recently assembled a multidisciplinary panel of 11 experts and used the RAND/UCLA appropriateness method to systematically identify a set of 41 quality indicators in 6 areas of care: ascites, variceal bleeding, hepatic encephalopathy, hepatocellular cancer, liver transplantation and general cirrhosis⁽⁷⁾. The quality indicators

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are constructed as “if-then” statements, where “if” characterizes the eligible patient population and “then” describes the care that should be given. Ideally this format would allow the quality indicators to be translated into a checklist so that quality of care can be systematically measured and eventually tied to reimbursement⁽⁸⁾.

Although these quality indicators represent an important step in defining quality of care for patients with cirrhosis, it is not yet known whether they will translate into useful measures of physician and/or health system performance. In order to function effectively, quality indicators need not only to be medically justified, but also need to 1) be collectable using automated systems in order to decrease measurement burden, 2) have a clear denominator and denominator exclusions for the sake of consistency, 3) be linked to the actions of one provider or one institution, and 4) occur with sufficient frequency to produce reliable estimates⁽⁹⁾. The aim of this study was to determine whether quality indicators for cirrhosis meet these measurement criteria in a real world practice.

Methods

We applied quality indicators to adults hospitalized at our institution with complications of cirrhosis between June 2006 and May 2009. Five indicators were chosen on the basis of having the highest level of agreement by the expert panel (from 72%–100%), and are quoted verbatim as follows: 1) If hospitalized patients with ascites have an ascitic fluid polymorphonuclear (PMN) count of 250 cells/mm³, then they should receive empiric antibiotics within 6 hours of the test result. 2) If patients with cirrhosis present with upper gastrointestinal bleeding (UGIB), then they should receive upper endoscopy within 24 hours of presentation. 3) If patients with cirrhosis are found to have bleeding esophageal varices, then they should receive endoscopic variceal ligation (EVL) or sclerotherapy at the time of index endoscopy. 4) If patients with cirrhosis survive an episode of acute variceal hemorrhage, then they should receive one of the following therapies to prevent recurrence of variceal hemorrhage: EVL every 1–2 weeks until obliteration, beta-blockers, or a combination. 5) If patients have clinically apparent (i.e., moderate to severe) ascites and normal renal function, then they should be managed with both salt restriction and diuretics (including a combination of spironolactone and loop diuretics).

For each of these indicators, we determined (when possible) our institution’s performance. However, more importantly, we determined for each of these indicators whether the numerator and denominator could be measured using automated systems, we recorded any denominator exclusions, assessed the linkage between the indicator and a specific physician or institution, and calculated the frequency per physician and per institution each year. Finally, we reviewed each chart to investigate reasons why the quality indicators were not met.

Results

1) There were 44 cases of SBP identified with empiric antibiotics given in 25 cases (56%) within 6 hours of the test result. For this quality indicator, the numerator (antibiotic administration within 6 hours) and denominator (>250 PMN/mm³ in ascetic fluid) could be collected electronically based on the laboratory computer system and the nursing medication administration record. However, denominator exclusions such as post-surgical fluid collections and malignant ascites required physician chart review. Documented reasons for late administration included a delay from the time the order was written to the time the antibiotic was administered as well as a limited intravenous access.

2) Upper GI bleeding in a patient with cirrhosis was more difficult to assess, as the appropriate denominator was not clear based on the wording of the published quality indicator. Therefore, we specified that patients must present with hematemesis or melena associated with tachycardia, hypotension, requirement for blood transfusion, or >2g drop in hemoglobin. Using these criteria, we identified 76 cases of “clinically significant” UGIB in cirrhosis patients. Among these cases, upper endoscopy was performed at our institution within 24 hrs in 35 (46%) of cases. Of the 41 cases in which early EGD was not performed at our institution, 9 (12%) had been performed at an outside hospital prior to transfer. Because 29 patients had been transferred from another hospital, there was no direct link to one provider or institution in these cases. Among the patients who initially presented to our institution and did not receive endoscopy within 24 hours, documented reasons included low suspicion for variceal bleeding based on the clinical presentation and/or recent endoscopy demonstrating no or small varices.

3,4) “Bleeding esophageal varices” were also difficult to assess because only two patients had active variceal bleeding at the time of endoscopy and 25 had an esophageal red wale or nipple sign. Among the 76 cirrhosis patients identified above with clinically significant UGIB, 67 were found to have esophageal varices on endoscopy; of these, banding or sclerotherapy was performed in 40 (59%). Five had stigmata of gastric variceal bleeding and would thus represent an appropriate denominator exclusion from banding. In the subset of 40 patients in which endoscopic therapy was performed, 100% had repeat EGD performed within 1–2 weeks and/or beta-blocker administered.

5) Because the method for determining “clinically apparent (moderate to severe)” ascites had not been specified in the quality indicator, we chose to require that patients underwent diagnostic or therapeutic paracentesis while hospitalized. Using this metric, there were 259 cases of moderate to severe ascites identified with the combination of loop diuretic and spironolactone prescribed in 195 (75%) on discharge. In the 64 cases in which loop diuretic and spironolactone were not prescribed, 40 had abnormal renal function (which we defined as creatinine >1.3 mg/dl). In one case amiloride was substituted for spironolactone. Therefore, our institution’s performance for this indicator was 196/219 (89%). Of the 259 cases of moderate to severe ascites there were 227 (88%) in which the recommendation for salt restriction was documented either in daily progress notes or on the discharge summary. By using the requirement for paracentesis and the creatinine threshold of 1.3 mg/dl, the denominator and most common denominator exclusion could be determined using automated systems. However, one part of the numerator (low salt diet) as well as other uncommon denominator exclusions (such as malignant ascites) still required chart review.

Discussion

Cirrhosis is a complex chronic disease that requires quality of care measurement to reduce practice variation and improve clinical outcomes. In this study, we applied the top 5 of a recently published set of quality indicators to patients hospitalized in our institution. We found that measuring all five indicators required some degree of physician chart review, and some of the indicators (#3,4) could not be reliably measured at all. These findings suggest that while these indicators may be useful metrics for individual institutions to perform self-assessment and practice quality improvement, they are not yet ready for routine administrative use or linkage to reimbursement.

In addition to measurement problems and burden, these indicators are not always tied to a particular institution or providers, and occur with insufficient frequency to allow reliable estimates. Prior studies have shown that estimating performance requires at least 100 patients per individual physician in a given time period in order to obtain 80% reliability⁽¹⁰⁾.

Given that our institution is relatively large (550 beds, with 7 hepatologists) and still did not produce this number over a three-year period, we suggest that as performance metrics for cirrhosis improve, they will be most applicable at the institutional level.

This study was not intended to be an exhaustive assessment of all 41 indicators, but rather as a case study of the logistical problems encountered when measuring quality of care for cirrhosis. Limitations of our study include its single center nature. However, as a large academic institution with a computerized medical record and order entry system, this center may represent the “best case” scenario for quality measurement. Another limitation was the focus on hospitalized patients only. We speculate that including outpatients would cause even more measurement difficulties given shared care between multiple physicians at different institutions.

In conclusion, measuring quality of care in cirrhosis is a laudable goal, but further efforts are needed to develop quality indicators which can be measured in a reliable and automated fashion.

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Abbreviations

SBP	spontaneous bacterial peritonitis
PMN	polymorphonuclear
UGIB	upper gastrointestinal bleeding
EVL	endoscopic variceal ligation
MAR	medication administration record
EGD	Esophagogastroduodenoscopy
TIPS	transjugular intrahepatic portosystemic shunt

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