Proactive Case Finding To Improve Concurrently Curative and Palliative Care in Patients with End-Stage Liver Disease

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Abstract

Background: Palliative care and preparation for liver transplantation are often perceived as conflicting for patients with end-stage liver disease (ESLD). We sought to improve both simultaneously through a case finding and care coordination quality improvement intervention.

Methods: We identified patients with cirrhosis using validated *ICD-9* codes and screened them for ESLD by assessing medical records at a VA hospital for either a model for end-stage liver disease (MELD) ≥ 14 or a diagnosis of hepatocellular carcinoma (HCC) between October 2012 and January 2013. A care coordinator followed veterans from the index hospitalization through April 2013 and encouraged treating physicians to submit liver transplant evaluation consults for all veterans with a MELD ≥ 14 and palliative care consults for all veterans with a MELD ≥ 20 or inoperable HCC.

Results: We compared rates of consultation for 49 hospitalized veterans and compared their outcomes to 61 pre-intervention veterans. Veterans were more likely to be considered for liver transplantation (77.6% versus 31.1%, $p < 0.001$) and receive palliative care consultation during the intervention period, although the latter finding did not reach statistical significance (62.5% versus 47.1%, $p = 0.38$).

Conclusions: Active case finding improved consideration for liver transplantation without decreasing palliative care consultation.

Introduction

END-STAGE LIVER DISEASE (ESLD) is increasing in prevalence and presents patients and providers with many challenges.¹ Liver transplantation is definitive therapy, yet some patients do not receive it because of comorbidities or scarcity of donor organs. Many of these patients are likely to have supportive care needs before death, yet many providers and patients may view palliative care and liver transplantation as mutually exclusive.² In fact, patients considered for liver transplantation are likely to benefit from palliative care, especially given the challenges around end-of-life communication in the setting of hope for transplant and the lower health-related quality of life in patients with ESLD compared

to healthy populations.³ Palliative care consultation has been shown to improve communication, quality of life, and even survival in other populations.^{4,5}

Using a model for concurrent palliative and curative care, this quality improvement project implemented a population-based case identification and care coordination approach to increase transplant and palliative care referral rates simultaneously.⁶ We chose the Veteran Affairs (VA) Health System for this quality improvement effort for several reasons. First, it is the largest provider of care for cirrhosis in the United States⁷ and recent data suggest that the prevalence of cirrhosis in the VA is increasing rapidly.¹ Second, rates of liver transplantation among patients with cirrhosis in the VA care are low.^{8,9} Third, the VA has a

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robust data and quality improvement infrastructure upon which to build interventions.¹⁰

Methods

Case identification

We selected a minimum model for end-stage liver disease (MELD) of 14 for transplant evaluation, because this is the most common reason for transplant referral used at our VA. A systematic review of noncancer conditions concluded that among patients with decompensated cirrhosis, a median 6-month prognosis could be expected when patients had a Child-Pugh score of at least 12 or a MELD of at least 21.¹¹ These data, combined with prior MELD experience, perceived need by hepatology and palliative care colleagues, and resource availability led us to use a cutoff of 20 to consider prospective palliative care referral.¹²

For patients with hepatocellular cancer (HCC), cases were uniformly reviewed for transplant eligibility. Proactive palliative care consult was considered if the patient had a Cancer Liver Italian Program (CLIP) score of at least 2, given that CLIP is both prognostically valid^{13–15} and is calculable from data readily available in the medical record.

We electronically identified veterans admitted to the hospital carrying a diagnosis of cirrhosis or HCC in the prior 24 months in an inpatient or outpatient setting with previously validated ICD-9 codes¹: 571.2, 571.5, 571.6 (cirrhosis codes), 789.5, 456.0–2 (including 456.20 and 456.21) 567.23, 572.4, 572.2, 348.3x, 070.0, 070.2x, 070.4x, 070.6, 070.71 (hepatic decompensation codes), and 155.0 (hepatocellular carcinoma).

Medical records were screened for either a MELD $\geq$ 14 or a diagnosis of HCC between October 2012 and January 2013.

Care coordination

A nurse care coordinator (L.R.) followed patients from index hospitalization between October 2012 and January 2012 through April 2013 and identified gaps in care and potential barriers to transplant (including the absence of social support, substance abuse, and comorbidities). The nurse care coordinator encouraged providers to place a liver transplant evaluation consult for all veterans meeting the transplant evaluation and/or palliative care consultation eligibility criteria described above. While patients were hospitalized, the care coordinator would interact in person with the primary team to make recommendations for referrals and ensure follow-up in liver clinic upon discharge. After discharge, the care coordinator would interact via phone and e-mail with the veteran's primary care provider to ensure that the veteran had appropriate referrals and follow-up. She attended clinic visits with identified veterans in liver and oncology clinics. She also helped with problem solving on an as-needed basis, for example, helping identify transportation or lodging resources. The care coordinator also attempted to identify long-term solutions to frequently identified problems and incorporate them into routine care. For example, several veterans were not eligible for transplant because of active substance use and many were unaware of the substance rehabilitation program offered by the VA so the care coordinator arranged for representatives of the program to attend cirrhosis clinics on a regular basis and consult with veterans during their routine visits.

As part of the quality improvement project we developed a liver transplant evaluation consult request to improve standardization of documentation of transplant evaluation in the VA electronic medical record. Consult requests were reviewed by the liver transplantation nurse practitioner (S.K.) through the electronic medical record; she completed a templated transplant consult that indicated whether a patient was actively being considered for transplant. If a patient was not a transplant candidate and whether this was for modifiable or nonmodifiable reasons was documented in order to help guide goals of care discussions.

Statistical analysis

We compared pre–post rates of liver transplant evaluation and palliative care consultation between care management recipients with a cohort identified using the same ICD-9 codes and screening during the same period 1 year pre-intervention (October 2011 to January 2012). We used two sample proportions z test to determine pre–post differences between rates of transplant evaluation and palliative care consultation.

Results

Outcomes of 49 hospitalized veterans were compared to 61 pre-quality improvement project veterans. Veterans in both groups had complex comorbidities (count of 17–18 on average medical problems on their active problem list), half were actively using alcohol or drugs, and one-third had a MELD $\geq$ 20 at the time of the index hospitalization and were not statistically distinguishable on these characteristics. Post-versus pre-quality improvement project veterans were more likely to be considered for liver transplantation (77.6% versus 31.1%, $p < 0.001$) and more likely to have their transplant evaluation completed (22.4% versus 4.9%, $p = 0.01$). More patients received palliative care consults after the quality improvement intervention but this finding was not statistically significant (62.5% versus 47.1%, $p = 0.38$; Table 1).

TABLE 1. PATIENT FACTORS AND CONSULTATION RATES (LIVER TRANSPLANT EVALUATION AND PALLIATIVE CARE) BEFORE AND AFTER QUALITY IMPROVEMENT INTERVENTION

<i>Factors</i>	<i>Before quality improvement intervention (n=61)</i>	<i>After quality improvement intervention (n=49)</i>	<i>p value</i>
Considered for OLT	19 (31.1%)	38 (77.6%)	<0.001
Packet completed	3 (4.9%)	11 (22.4%)	0.009
UNOS listed	0	1	0.344
EtOH/drug use	28 (45.9%)	27 (55.1%)	0.352
Problem list count (mean)	17.6	16.5	0.656
# patients with MELD > 19	17 (27.9%)	16 (32.7%)	0.631
Palliative care consult for patients with MELD > 19	8 (47.1%)	10 (62.5%)	0.380

OLT, orthotopic liver transplant; UNOS, United Network for Organ Sharing; EtOH, ethyl alcohol; MELD, model of end-stage liver disease.

Among the patients evaluated for orthopedic liver transplant during the quality improvement project ($n=38$), 13 were considered to be appropriate for transplant and 11 had their packet completed. Twenty-five were not considered to be candidates for transplant, with the most common reasons being lack of social support ($n=5$) and active substance use ($n=12$).

Discussion

This innovative project aimed to implement an integrated model of concurrent palliative care in veterans with ESLD both to improve liver transplant referrals while supporting the palliative care needs of this population. Few prior studies have attempted to integrate palliation and curative treatments in patients with ESLD. One program, based at UC Davis, concurrently provided hospice care while patients were listed for liver transplantation and 6 of 157 patients were offered a liver graft during this program.¹⁶ Another pre-post study followed patients considered for transplant in a liver transplant intensive care unit (ICU) and found that early integration of palliative care was feasible and decreased ICU length of stay and increased do-not-resuscitate (DNR) rates without affecting mortality.¹⁷ Similarly, we were able to maintain palliative care access in a vulnerable population while improving liver transplant referral rates.

Patients who received care at the VA for cirrhosis during this quality improvement project had complex medical problems. On average, these patients had 17 medical problems and half of the patients were actively using alcohol or drugs. The most common barriers to liver transplantation in these patients were lack of social support and substance abuse. Our findings are consistent with documented high rates of alcohol and substance abuse (a common cause of cirrhosis) among veterans, which may be associated with a lower likelihood of receiving treatment for hepatitis C virus and a higher risk of posttraumatic stress disorder (PTSD) and depression.^{18–20} During our project, we were able to more closely integrate our outpatient rehabilitation clinic with our cirrhosis clinic. These patients, however, would likely benefit from further, earlier interventions for issues related to alcohol and drug use and mental health issues. For patients at the end of life, a multidisciplinary palliative care team is likely to help with complex symptoms and family dynamics that may be negatively impacting a patient's quality of life and death.

There are several limitations to this quality improvement project. This was a real-time clinical improvement and so we were only able to make a pre-post comparison and the improvements in care may be secular trends rather than specifically due to our interventions. Our sample size was small and follow-up time was short and so we could not determine the intervention's impact on other relevant outcomes, such as hospice referral rates. We were also unable to detect a significant difference in palliative care consultation rates, likely due, at least in part, to the small sample size. Baseline rates of palliative care consultation were also high which may represent the strength of the existing palliative care program prior to the intervention, but may also indicate that earlier referrals to palliative care should be considered. Palliative care needs assessments for patients at time of transplant referral may be helpful to gain a better understanding if earlier referrals to palliative care would be beneficial. In addition, we were unable to measure health related quality of life or

satisfaction with care, and future evaluations of similar interventions should track these important outcomes. Furthermore, this quality improvement project was completed at a VA facility and may not be generalizable to other care systems. Finally, this care-coordinator intervention is resource intensive and may not be possible in other settings, however after the initial 4-month period, we have been able to automate and integrate several aspects of the improvement so that an additional staff member is not required.

This is the first known quality improvement project aimed at simultaneously improving transplant referrals and palliative care consultation. Pairing these two services may increase patient receptivity to both services, although future work with larger samples is needed to confirm this hypothesis.

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Author Disclosure Statement

None of the authors have conflicts of interest to disclose.

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