

## Research Article

# Timing of End-of-Life Decision-Making in Patients Awaiting Transplantation

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## Abstract

**Introduction:** Patients with end stage liver disease awaiting transplantation often develop acute complications during the wait-list period. They are in a unique situation in which organ transplantation could completely reverse their disease with excellent outcomes, making it difficult to determine at which point end-of-life decision-making should occur. The purpose of this study was to characterize the current use and timing of supportive care team involvement.

**Methods:** We conducted a retrospective cohort study of all cirrhotic patients admitted to the ICU between January 1, 2013 and December 31, 2014. Supportive care data and outcomes were recorded by reviewing the date and patient medical status at the time of consultation.

**Results:** Of the 170 patients admitted to the ICU with cirrhosis, 120 (71%) were either discharged or underwent a transplant and 50 (29%) died in the ICU. Of all patients, 94 (55%) were listed for transplant. Of the 50 patients who died in the ICU, 17 (34%) received a supportive care consult during their ICU stay. Median (IQR) time between ICU admission and supportive care consult was 14 (10-27) days. Median (IQR) time between supportive care consult and death was 1 (0-1) day.

**Conclusion:** Only 10% of patients and families received supportive care assistance. Of the patients who died, only a third engaged in end-of-life discussions with a dedicated team. While transplantation is the optimal outcome in this population, critically ill patients awaiting transplantation would benefit from goals of care discussions earlier in their treatment.

**Keywords:** Liver transplantation; Decision-making; Supportive care

## Introduction

Over the past two decades there has been an increased focus on improving the quality of end-of-life care [1]. As life expectancy has increased, so has the development of chronic and often debilitating disease, leaving patients and their families with both physical and nonphysical burdens, and leaving providers with a new set of challenges in caring for patients with advanced illness. In 2001, the American College of Surgeons formed the Palliative Care Task Force, whose principles not only include access to hospice care around time of death, but also aim to alleviate pain and suffering, and optimize quality of life in earlier stages of disease [2]. This is representative of a general shift in the field of palliative care medicine to engage with patients and their family's fartherupstream in the trajectory of chronic illness, in order to address issues related to quality of life and goals of care. Furthermore, recent studies, largely within the oncologic and critical care populations, have found that early, dedicated and transparent communication among providers, patients, and their families results in decreased Intensive Care Unit (ICU) Length of Stay (LOS) [3], decreased levels of anxiety and depression among family members [4], and improved provider-level assessments of death and dying [5].

Patients with End Stage Liver Disease (ESLD) awaiting transplantation represent a unique group among those with

advanced illness. Given the shortage of available organs, long wait list times mean progression of chronic disease and high risk for acute complications that may ultimately lead to death before a donor organ becomes available. Currently there are over 15,000 patients on the wait list for liver transplantation [6]. In 2014, nearly 12,000 were delisted for death or deterioration [6]. Nonetheless, those who do make it to transplantation have the potential to reverse their disease with excellent outcomes, with 1-year survival rates approaching 90%, and 5-year survival rates greater than 70% [6]. The inherent uncertainty of living with a progressive disease with a high symptom burden, but also with the possibility of cure can be distressing to patients and families dealing with advanced liver disease [7-9]. Furthermore, with the stark contrast in outcomes for cirrhotic patients, it is often difficult for providers to determine the appropriate time when end-of-life decision-making should occur.

The purpose of this study is to evaluate the utilization and timing of palliative care services amongst critically ill patients with ESLD admitted to the ICU in a single institution.

## Methods

This study took place at a single tertiary care center that typically performs between 50 and 60 liver transplants per year. We have a 24 bed ICU in which patients are managed both by their primary team as well as a dedicated critical care team, though the decision to involve

**Table 1:** Demographic characteristics (n=170).

Age, median (IQR)	59 (57-67)
Male gender, n (%)	105 (62%)
MELD score at ICU admission, median (IQR)	28 (17-37)
Palliative care consult, n (%)	18 (11%)
ICU length of stay (days), median (IQR)	6 (3-12)
Time until palliative care consult (days), median (IQR)	14 (10-27)
ICU mortality, n (%)	50 (30%)

**Table 2:** Demographic and clinical characteristics of all patients.

	No Palliative Care (n = 152)	Palliative Care (n = 18)	P value
Age, median (IQR)	59 (52-66)	61 (54-68)	0.47
Male	65%	31%	0.01
Listed for liver transplant	55%	56%	0.67
MELD at ICU admission, median (IQR)	27 (26-37)	36 (25-42)	0.01
Died in ICU	25%	67%	<0.01

supportive care services is ultimately at the discretion of the primary. We conducted a retrospective cohort study of critically ill patients with end stage liver disease between January 1, 2013 and December 31, 2014. We included all adults (>18 years of age) with a diagnosis of cirrhosis who were admitted to the ICU. Patients were included whether or not they were actively listed for liver transplant at the time of ICU admission (patients undergoing transplant evaluation and those who were de-listed comprise the latter group). Patients were excluded if they were under the age of 18. Of note, we did not include patients prior to January 1, 2013 because medical records for that time period do not clearly delineate whether or not a patient was seen by a dedicated Palliative Care team (as opposed to engaging in end of life discussions with members of primary or consulting teams).

Medical records were reviewed for the disposition of the study population—looking specifically at whether patients went on to transplantation, whether they were discharged from the ICU without transplant, or whether they died while in the ICU. We also evaluated whether or not each patient received a palliative care consult, time in between ICU admission and consult, and time between consult and death. Data was analyzed using IBM SPSS version 22. Non-parametric data were reported as medians with Interquartile Ranges (IQR) and compared using rank sum or  $\chi^2$  tests where appropriate. ANOVA was used to compare variables with more than two events.

## Results

Demographic characteristics of the 170 patients included in this study are shown in (Table 1). Median (IQR) age was 57 (52-67). Median (IQR) MELD score at time of ICU admission was 28 (17-37). Only 18 (11%) patients received palliative care consults, and this was initiated at a median (IQR) of 14 (10-27) days after ICU admission. We compared the cohort of patients who did not receive palliative care consults against those who did (Table 2). Patients in the latter group were less likely to be men (65% vs. 31%,  $p = 0.01$ ), tended to have higher MELD scores at time of ICU admission (27 [26-37] vs. 36 [25-42],  $p = 0.01$ ), and had a higher ICU mortality rate (25% vs. 67%,  $p < 0.01$ ). Fifty patients (30%) in our study died in the ICU.

**Table 3:** Disposition (n = 170).

	Liver Transplant (n = 17)	Discharged no Liver transplant (n = 103)	Died in ICU (n = 50)	p value
Palliative care involved, n	0	6	12	<0.01
ICU LOS (days), median (IQR)	7 (3-14)	4 (3-8)	12 (6-17)	<0.01

**Table 4:** Demographics of patients who died in ICU (n = 50).

	No Palliative Care (n = 38)	Palliative Care (n = 12)	p value
Age, median (IQR)	59 (52-66)	61 (53-69)	0.7
Male	71%	25%	<0.01
MELD score at time of ICU admission, median (IQR)	35 (26-40)	38 (25-42)	0.6
Reason for ICU admission			0.3
Sepsis	71%	92%	
GI bleed	3%	0%	
Unknown	26%	8%	
MELD score day of death, median (IQR)	42 (30-45)	30 (23-41)	0.07

These patients were more likely to have used palliative care services (of interest, none of the patients who went on to liver transplant were seen by palliative care) and had a higher median (IQR) ICU LOS than both the patients who were transplanted and those who were discharged from the ICU without undergoing LT (12 [6-17] vs. 7 [3-14] vs. 4 [3-8] days, respectively,  $p < 0.01$ ) (Table 3).

Within the cohort of patients who died in the ICU, those who received palliative care consults were again less likely to be men (71% vs. 25%,  $p < 0.01$ ), but the demographics of the two groups were otherwise similar (Table 4). There was no difference in age, reason for ICU admission, MELD score at either ICU admission or date of patient's death.

## Discussion

This is the first study performed to characterize the use and timing of palliative care services in critically ill patients with ESLD, a cohort with debilitating chronic disease complicated by an acute insult necessitating ICU-level care. With long wait list times as a result of donor organ shortage, these patients are at high risk of mortality before transplant. Furthermore, these patients experience high levels of physical and psychosocial distress, which is exacerbated by the uncertainty inherent in a morbid disease with the potential for cure. In spite of that, we found that only 11% of all patients, and 24% of those who died while in the ICU, received a referral for palliative care services. Our findings highlight that utilization of specialized medical teams in addressing patients and families with severe illnesses of poor prognosis is extremely low.

Patients who received a consult were overwhelmingly more likely to be female, but it is difficult to determine the cause from medical record abstraction alone. Characteristics were otherwise similar among the patients who died in the ICU. For the 76% of patients who died without formal palliative care referral, we assume that primary or critical care providers attended to end-of-life concerns in addition to the multitude of medical and procedural needs incurred as a result of their illness. Numerous studies conducted since the landmark SUPPORT trial have included management of pain and discomfort,

minimizing futile interventions, and having ongoing conversations regarding patient prognosis as patient and family-identified needs during times of advanced illness [1,4,10]. In this high acuity setting, we believe that involving a dedicated palliative care team to address symptoms and engage in goals of care conversations may improve the experience for patients, their family members, and providers. Ideally, this involvement should be at the time of liver transplant listing evaluation early in the course of disease.

Within our own patient cohort, we found that palliative care referrals happened relatively late in their ICU stay, when patients themselves were more likely to be encephalopathic, mechanically ventilated, or otherwise unable to participate meaningfully in discussions regarding goals of care. We believe that initiating these conversations may benefit both patients and their families, as has been previously demonstrated in other studies [3-5,11], and would likely be more appropriate earlier in a patient's time course. This could be at time of ICU or hospital admission, or even during initial evaluation for transplantation. Prior studies have demonstrated that earlier intervention from palliative care services leads to improved end-of-life care for patients and fewer symptoms of post-traumatic stress disorder among family members [4,12]. Our next steps in improving access to palliative care at our institution should include implementation of a previously validated metric, such as the Quality of Death and Dying questionnaire [5,12] to gather prospective data that will allow us to assess the impact of palliative care in our patient population.

The retrospective nature of our study carries limitations itself, and although our comparative cohorts are disproportionate our overall sample size of 170 is adequate. Another bias in our findings may be in relation to our centers practice patterns and may not be applicable to other centers which have a standardized and robust palliative care team that always participates in liver failure patient's care. From our experience, we do not believe that is currently the norm for liver transplant programs and challenges in obtaining timely supportive care consults in patients with advanced and/or terminal disease is not exclusive to our institution. Fadul, et al. hypothesize that use of the term "palliative care" conveys more negativity, creating a barrier toward referral [13]. As a result there has been a movement to change the term to supportive care, which can serve as a reminder to patients, their families, and providers that goals of care discussions and symptom management do not have to equal hospice care. This has been studied in a large cancer institution where the term "supportive care" has been viewed more favorably than "palliative care" by referring providers, patients and families, resulting in a greater likelihood of early referrals. A similar dynamic could be applicable to patients awaiting liver transplantation, where the severity of their illness is daunting but does not preclude them from excellent outcomes if they make it to transplant.

## Conclusion

With such severe disparities in organ supply versus demand, many patients with end stage liver disease die each year awaiting live

saving liver transplantation. A key component of patient and family care should include end of life and supportive care discussions in the event of unfortunate circumstances. Although such discussions are not only difficult, and have a pretense of potentially distracting from patient care, supportive care services should be employed throughout a patient's disease experience to optimize their quality of life.

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