Research Article

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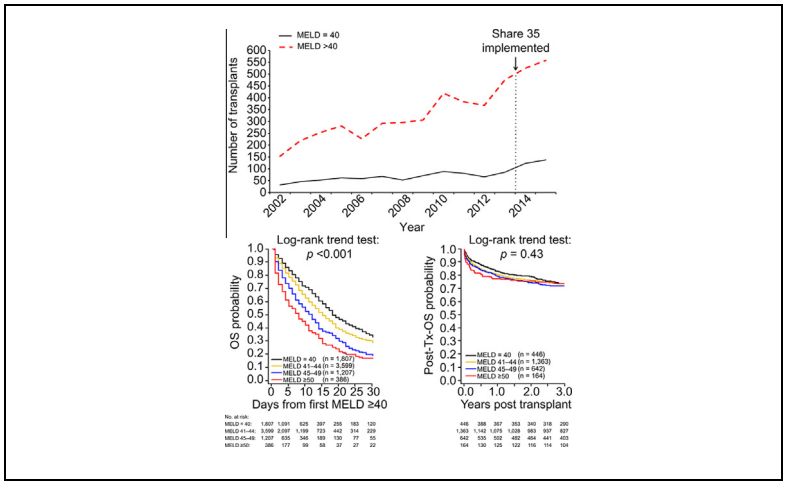
Inequity in organ allocation for patients awaiting liver transplantation: Rationale for uncapping the model for end-stage liver disease

Graphical Abstract



Highlights

- Patients with MELD >40 have significantly greater waitlist mortality than patients with MELD = 40.
- The number of patients transplanted with MELD >40 has increased over the past 15 years.
- There was no difference in survival for patients transplanted with MELD >40 compared to MELD = 40.
- Liver transplant conferred a survival benefit as MELD increased above 40.
- The MELD score should be uncapped to allow equitable distribution of livers to the patients most in need.

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Lay summary

In the United States (US), organs for liver transplantation are allocated by an objective scoring system called the Model for End-stage Liver Disease (MELD), which aims to prioritize the sickest patients for transplant. The greater the MELD score, the greater the mortality without liver transplant. The MELD score, however, is artificially capped at 40 and thus actually disadvantages the sickest patients with end-stage liver disease. Analysis of the data advocates uncapping the MELD score to appropriately prioritize the patients most in need of a liver transplant.

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Inequity in organ allocation for patients awaiting liver transplantation: Rationale for uncapping the model for end-stage liver disease

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Transplantation

Background & Aim: The goal of organ allocation is to distribute a scarce resource equitably to the sickest patients. In the United States, the Model for End-stage Liver Disease (MELD) is used to allocate livers for transplantation. Patients with greater MELD scores are at greater risk of death on the waitlist and are prioritized for liver transplant (LT). The MELD is capped at 40 however, and patients with calculated MELD scores >40 are not prioritized despite increased mortality. We aimed to evaluate waitlist and post-transplant survival stratified by MELD to determine outcomes in patients with MELD >40.

Methods: Using United Network for Organ Sharing data, we identified patients listed for LT from February 2002 through to December 2012. Waitlist candidates with MELD ⩾40 were followed for 30 days or until the earliest occurrence of death or transplant.

Results: Of 65,776 waitlisted patients, 3.3% had MELD ⩾40 at registration, and an additional 7.3% had MELD scores increase to ⩾40 after waitlist registration. A total of 30,369 (46.2%) underwent LT, of which 2,615 (8.6%) had MELD ⩾40 at transplant. Compared to MELD 40, the hazard ratio of death within 30 days of registration was 1.4 (95% CI 1.2–1.6) for patients with MELD 41–44, 2.6 (95% CI 2.1–3.1) for MELD 45–49, and 5.0 (95% CI 4.1–6.1) for MELD ⩾50. There was no difference in 1- and 3-year survival for patients transplanted with MELD >40 compared to MELD = 40. A survival benefit associated with LT was seen as MELD increased above 40.

Conclusions: Patients with MELD >40 have significantly greater waitlist mortality but comparable post-transplant outcomes to patients with MELD = 40 and, therefore, should be given priority for LT. Uncapping the MELD will allow more equitable organ distribution aligned with the principle of prioritizing patients most in need.

Lay summary: In the United States (US), organs for liver transplantation are allocated by an objective scoring system called the Model for End-stage Liver Disease (MELD), which aims to prioritize the sickest patients for transplant. The greater the MELD score, the greater the mortality without liver transplant. The MELD score, however, is artificially capped at 40 and thus actually disadvantages the sickest patients with end-stage liver disease. Analysis of the data advocates uncapping the MELD score to appropriately prioritize the patients most in need of a liver transplant.

Introduction

The disparity between the availability of donor organs and the growing number of patients awaiting transplant is one of the greatest challenges in organ transplantation. A needs-based allocation policy prioritizes those at greatest risk of death on the waitlist while a utility-based policy prioritizes graft and patient survival. In 1998, the United States (US) Department of Health and Human Services adopted the Final Rule, which set guidelines for organ allocation based on medical urgency.[1] The goal was to balance equity and utility in the distribution of organs while avoiding futility. The transplant community continues to debate the relative weights of each.

In response to the increasing demand for liver transplantation (LT) in an era of organ shortage, there have been several liver

Keywords: Model for end-stage liver disease (MELD); Liver transplantation; Waitlist mortality; Liver allocation; Regional disparity; Share 35; Post-transplant outcome.

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