High MELD/PELD Versus Status 1A: Who Lives, Who Dies, and When ?

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I have no financial relationships to disclose within the past 12 months relevant to my presentation

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My presentation does not include discussion of off-label or investigational use

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Background

- Patients awaiting liver transplant with MELD/PELD scores of 35 or greater (M/P 35+) or listed as Status 1A (1A) have high mortality on the OPTN waiting list (WL), but differing indications and comorbid conditions
- Currently, organs for 1A patients in the US are allocated through regional sharing due to high WL mortality, and organs for M/P patients are allocated on a local-first basis by descending score





Aims

- To determine pattern of WL mortality and post-transplant survival of patients with MELD/PELD 35+ compared to 1A patients
- To explore if broader sharing at high M/P scores would alter these outcomes





Methods: Waiting List Survival Analyses

- Patients on liver transplant waiting list with the first occurrence of Status 1A or MELD/PELD ≥ 35 during January 1, 2007 to December 31, 2009
- 2 Approaches:
 - <u>Intent-to-Treat</u>: from the first day of reaching the status to death, transplant, or 30 days
 - <u>As-Treated</u>: from the first day of reaching the status to death, transplant, status change, or 30 days
- Analyses:
 - Risk of mortality over time: smoothed hazard



Methods: Post-transplant Survival Analysis

- The study included patients who received deceased donor liver transplants between January 1, 2006 and December 31, 2010.
 - Patients with MELD <35 or MELD exception at the time of transplant excluded
- Graft survival
 - Patients followed from transplant date until the first occurrence: death, next liver transplant date, 3 years after transplant, or date 12-31-10
- Patient survival
 - Patients followed from transplant date until first occurrence: death, 3 years after transplant, or date 12-31-10



Results: Status 1A vs 35+: Patient Characteristics

Characteristic		1A	MELD 35+	p-value
Ν		1,654	4,295	
Mean Age		33.4	48.8	<.0001
Gender				<.0001
	Female	59.9	37.3	
	Male	40.1	62.7	
Race				<.0001
	White	61.5	63.9	
	Black	15.8	11.3	
	Native Am	1.2	0.8	
	Asian	6.1	4.3	
Primary Diagnosis				<.0001
	HCV	2.3	24.5	
	Alcoholic Liver Disease	1.6	20.9	
	Cholestatic Disease	2.4	11.5	
	Other (FHF, Drug, AIH, unknown)	93.8	43.1	
				SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

Results: Waitlist Mortality – Intent to treat

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Results: Waitlist Mortality – Intent to treat



Results: Waitlist Mortality – As treated

Status 1A





Results: Waitlist Mortality – As treated



Post Transplant Graft Survival – KM Curve



Post Transplant Graft Survival-Adjusted Hazard Ratio



1st year post Tx (P<0.05)

* Cox regression was adjusted for age, gender, race, cause of liver failure, transplant year, and liver donor risk index

Post Transplant Patient Survival – KM Curve



Post Transplant Patient Survival-Adjusted Hazard Ratio



* Cox regression was adjusted for age, gender, race, cause of liver failure, transplant year, and liver donor risk index

Methods: LSAM Modeling

- Using LSAM, impact of regional sharing for MELD/PELD 35+was modeled, while maintaining priority for Status 1A
 - Waitlist and total deaths (waitlist, removals, post-txp)
 - Percentage of livers shared outside local OPO
- Study population
 - Candidates on the liver waitlist and all donor organs that became available between 1-1-06 to 12-31-06
- Analytical approach
 - All results were averaged over 10 simulations for each allocation system. LSAM simulated allocation runs:
 - Current allocation system
 - Share 15 National system
 - Current allocation system with Regional Share 35
 - Share 15 National with Regional Share 35



Results – Modeling: Total Deaths



Distribution of total deaths





Conclusions

- Waitlist mortality is high for both Status 1A patients with those with calculated MELD/PELD ≥ 35
- The highest risk for 1A patients occurs in the first few days, with declining risk thereafter
- M/P 35+ patients experience increasing risk of mortality during the first 5 days after attaining this score, and risk remains higher than Status 1A thereafter
- Post-transplant survival is similar between the 2 groups with more death early for status 1A and more death later for MELD/PELD 35+





Conclusions

- Modeling with LSAM demonstrates decreased waitlist and total deaths with broader regional sharing for high MELD patients, while maintaining first priority for Status 1A patients
- Changes in liver allocation to allow for broader sharing for high MELD patients should result in more expeditious transplantation, thereby decreasing waitlist deaths





Results – Modeling: Waitlist Deaths

