

Title: Excellent post-transplant outcomes are possible in liver transplant recipients with alcohol-related liver disease and limited sobriety using a carefully developed multidisciplinary protocol

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Background: Carefully selected patients with alcohol related liver disease (ALD) and less than six months of sobriety have been shown to have acceptable post-liver transplant (LT) outcomes. A fair, equitable system to identify ALD patients that are unlikely to recover hepatic function with sobriety along with a low risk of alcohol relapse remains a challenge. Our study assesses the efficacy of a systematic algorithm which includes the involvement of a multidisciplinary team of healthcare professionals and use of the Stanford Integrated Psychosocial Assessment for Transplantation (SIPAT), created to identify suitable LT candidates with limited sobriety.

Methods: Single center retrospective study of all LT recipients (LTR) with ALD from 2015-2019. SIPAT is a validated tool performed for all transplant candidates at Stanford since 2013. The score ranges from 0-80, with a lower score indicating a favorable psychosocial profile. An official policy for limited (<6 months) sobriety was implemented in 2018 to include psychiatric and addiction medicine consultation. A post-LT relapse prevention plan (RPP) was implemented for all limited sobriety LTR. Post-LT outcomes were assessed and compared between those with and without limited sobriety using chi-square test, student t-test, and logistic regression analysis.

Results: Of 109 LTR, mean age was 54 years, 75% male, 45% Caucasian and 38% Hispanic origin. 14 LTRs had limited sobriety; 5 with severe acute alcoholic hepatitis. LTRs with limited sobriety were more likely to be married (71% vs. 57%, $p=0.04$) but had equal education background and socioeconomic status. Median SIPAT score was 26.5 and did not differ between groups ($p=0.43$). LTRs with limited sobriety were more likely to be presenting with first decompensation ($p=0.01$) and hepatorenal syndrome ($p<0.01$). Rates of graft rejection (43%), infection (29%), and 1-year survival (100%) were similar in both cohorts. Alcohol relapse occurred in 7%, other drug use in 6%, psychiatric hospitalization in 5%; 31% of LTRs returned to work. Of 7 LTRs with relapse, 5 had sustained use and only one LTR was in the limited sobriety cohort. Factors associated with relapse included pre-LT renal replacement therapy ($p=0.01$) and coexisting psychiatric illness ($p=0.02$). Relapse was associated with failure to comply with immunosuppression ($p<0.01$), relapse prevention plan ($p<0.01$) and support system breakdown ($p=0.03$). SIPAT variables associated with relapse were presence of psychopathology (OR 2.9), overall risk for psychopathology (OR 2.8), and beck depression inventory (OR 2.1).

The limited sobriety LTR group had excellent outcomes, 79% were adherent to their implemented RPP, with negative toxicology screens, follow-up with addiction medicine and regular attendance at support groups. Of the remaining nonadherent 21%, only one had relapse to alcohol. All were adherent to immunosuppressive medication, 35% had one episode of rejection, and none had graft failure. Return to work rates for the limited sobriety group were significantly higher (62%) compared to those without limited sobriety (30%) ($p<0.03$).

Conclusion: LT for ALD with limited sobriety achieves excellent outcomes in carefully selected patients. The previously validated psychosocial evaluation tool, SIPAT may be a useful adjunct in the selection of LT candidates with limited sobriety and should be studied prospectively. Implementation of RPP prior to LT may serve as an additional tool of ensuring acceptable outcomes in LTR with limited sobriety.

ALD Liver Transplant Recipients with Limited Sobriety

Demographics	
Age, years ($\mu \pm \sigma$)	53.2 \pm 7.8
MELD-Na ($\mu \pm \sigma$)	35 \pm 4
SIPAT score	20 \pm 10
Gender, n (%)	
<i>Female</i>	3 (21%)
<i>Male</i>	11 (79%)
Race, n (%)	
<i>Caucasian</i>	8 (57%)
<i>African American</i>	0
<i>Hispanic/Latino</i>	4 (29%)
<i>Other</i>	3 (21%)
Socioeconomic Status, n (%)	
<i>Low</i>	4 (29%)
<i>Medium</i>	4 (29%)
<i>High</i>	6 (43%)
Marital Status, n (%)	
<i>Single</i>	4 (29%)
<i>Married</i>	10 (71%)
Employment pre-LT, n (%)	
<i>Employed</i>	9 (64%)
<i>Unemployed</i>	5 (36%)
Complications of Cirrhosis	
<i>Variceal Bleed</i>	4 (29%)
<i>Ascites</i>	13 (93%)
<i>Spontaneous Bacterial Peritonitis</i>	4 (29%)
<i>Hepatic Encephalopathy</i>	13 (93%)
<i>Hepatocellular Carcinoma</i>	0
<i>Hepatorenal Syndrome</i>	12 (86%)
Outcomes	
Relapse, n (%)	1 (7%)
<i>Slip</i>	0
<i>Sustained</i>	1 (7%)
Mortality, n (%)	0
Graft Failure, n (%)	0
Rejection, n (%)	6 (36%)
Adherence to Immunosuppression, n (%)	14 (100%)
Return to Work, n (%)	9 (64%)
Compliance to RPP, n (%)	11 (79%)
<p>μ = mean, σ = standard deviation, n = number, % = percentage, MELD-Na = Model for End-stage Liver Disease, SIPAT = Stanford Integrated Psychosocial Assessment for Transplantation, Low = using government services, works part time, earns <\$55,000/y, or not working; Medium = supported, retired, working full time, or earns \$56,000–100,000/y; High = comfortable savings, comfortably retired, or >\$101,000/y, Slip = brief consumption episode of alcohol followed by resumed abstinence, Sustained = alcohol consumption of 4 or more drinks in a day or at least 1 drink for 4 or more days, RPP = Relapse Prevention Plan</p>	