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Bridge over Posthepatectomy Liver Failure

E02

A survival prediction model in liver transplant candidates with hepatitis C: a decision aid for patient management

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Purpose:

Hepatitis C virus (HCV) remains a leading indication for liver transplantation (LT) in the US and globally. While highly effective direct acting antiviral (DAA) therapy has revolutionized HCV therapy in patients with compensated and mildly decompensated liver disease, whether to treat a patient with end stage liver disease awaiting LT requires a highly individualized decision. We develop a prognostic model to predict early mortality without DAA therapy.

Methods:

Adult LT candidates with HCV in the Organ Procurement Transplantation Network data were divided into a model development and validation cohorts. The development cohort (n=2,360) included patients on the waitlist as of 1/1/2007, having been registered between 1/1/2004 and 1/1/2007 and the validation cohort (n=1,075) those on the waitlist as of 1/1/2008 with registration between 1/2/2007 and 1/1/2008. Survival analysis for 90 day mortality was conducted with day of the first available laboratory data as the beginning of follow-up. Multivariable proportional hazards regression analyses were used to identify prognostic factors associated with the mortality.

Results:

In the development cohort, 144 patients (6.1%) died without LT within 90 days. Prognostic variables independently associated with 90 day mortality consisted of age (hazards ratio [HR] = 1.031, 95% confidence interval [CI] = 1.015-1.047), serum albumin (HR = 0.480, 95%CI = 0.379 - 0.607), hypernatremia (HR = 1.190 per Na above 145mEq/mL, 95%CI = 1.066 - 1.329), MELD-Na (HR = 1.173, 95%CI = 1.153 - 1.193), and hepatic encephalopathy (HE): grade I or II (HR = 1.581, 95%CI = 1.197 – 2.087); grade III or IV (HR = 3.201, 95%CI = 2.084 – 4.917). A risk score (R) was

derived: R = (0.0304 × Age) – (0.7349 × Albumin) + (0.1741 × Na) + (0.1597 × MELD-Na) + (0.4578 × HE1/2) + (1.1636 × HE3/4). In the figure, when LT candidates in the validation cohort were divided into three groups: low risk (R<28.1), intermediate risk (28.1 ≤ R <29.2), and high risk (R≥29.2), their predicted and observed survival closely matched each other.

Conclusion:

The risk score, based on variables not considered in the current allocation system, such as age, albumin and HE, accurately reflects short term survival of endstage HCV patients. The model is helpful for LT physicians in their decision whether to institute DAA therapy in individual patients, taking into account availability of deceased and live donor organs.