Risk Prediction of Hepatocellular Carcinoma in Patients with Cirrhosis: The ADRESS-HCC Risk Model

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Background and Aims

• AASLD guidelines recommend surveillance for HCC with ultrasonography every six months in cirrhotic patients who have a risk of HCC of greater than 1.5% per year.

• We aimed to develop an HCC risk prediction model that estimates the one-year probability of developing HCC in an individual patient with cirrhosis.

Methods

• Study design: Retrospective cohort using the Scientific Registry of Transplant Recipients database from 03/2002 – 12/2011.

• Adult liver transplant (LT) waitlisted candidates with cirrhosis without prevalent HCC and followed at least 6 months were included.

• Incident HCC was defined by the date of application for HCC MELD exception points if it occurred at least 6 months after listing for LT.

• Cox proportional hazards regression was used to develop and validate a risk prediction model from two non-random subsets of the cohort.

• Model discrimination was determined using c-indices.

• Model calibration was evaluated by comparing the predicted and observed cumulative incidences of HCC at one year in the validation set.

Results

• A total of 34,931 patients with cirrhosis were included in the cohort, 1,960 (5.6%) were diagnosed with HCC during follow-up.

• Demographics of the total cohort, derivation and validation sets are shown in table 1.

• Age, Diabetes, Race, Etiology of cirrhosis, Sex and Severity of liver disease were associated with HCC (table 2) and used to develop the ADRESS-HCC risk model (table 3).

• The C-indices in the derivation and validation sets were 0.704 and 0.691 respectively.

• The calibration of the ADRESS-HCC risk model was excellent as the observed HCC risk closely and matched the predicted values (figure 1).

Conclusions

• The ADRESS-HCC risk model is a validated tool that can be used to counsel a wide variety of cirrhotic patients regarding their risk of HCC using individual clinical characteristics.

• It can also be used to identify patients who meet the AASLD criteria for entrance into HCC surveillance programs.

• Validation in other cohorts of cirrhosis is needed.