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Multi-institutional Development And Validation Of A Novel Calculator For Predicting Postoperative Major Morbidity After Hepatectomy For Hepatocellular Carcinoma Among Patients With HBV Infection

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Background : The identification of patients at high risk of developing postoperative morbidity is important to improve surgical safety. We sought to develop and validate an individualized online tool to predict postoperative major morbidity after hepatectomy for hepatocellular carcinoma (HCC) among patients with hepatitis B virus (HBV) infection.

Methods : A multicenter database of patients who underwent curative-intent hepatectomy for HCC were retrospectively analyzed. Using random assignment, 2/3 of patients were assigned to a training cohort, with the remaining 1/3 assigned to the validation cohort. Independent risk factors of postoperative major morbidity (Clavien-Dindo ≥3) were identified in the training cohort and used to construct an online calculator. The predictive accuracy of the calculator was assessed using C-index and calibration curves, which was further validated by the validation cohort and compared with other commonly-used scores.

Results : Among 2762 patients, 391 (14.2%) experienced major morbidity within 30 days after surgery. Seven preoperative variables, including diabetes mellitus, concurrent HCV infection, the Milan criteria, cirrhosis, HBV-DNA, ALBI, and APRI scores, were identified by univariate and multivariate analysis, which were used to construct the prediction calculator of postoperative major morbidity. This prediction model demonstrated good calibration and discrimination, with the C-indexes of 0.752 and 0.743 in the training and validation cohorts, respectively, which were significantly higher than those of the Child-Pugh, MELD, ALBI, and APRI scores (the training cohort: 0.565~0.650 and the validation cohort: 0.568~0.614, all P 〈 0.01).

Conclusions : The proposed easy-to-use calculator demonstrated good performance to individually predict postoperative major morbidity after hepatectomy for HCC in patients with chronic HBV infection.

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