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Development And Validation Of A Safety And Efficacy-Associated Risk Calculator For Hepatocellular Carcinoma In The Elderly After Resection (SEARCHER): An International Multicenter Study

Zi-Xiang CHEN[1], Lan-Qing YAO[1], Li-Hui GU[1], Lei LIANG[1], Ping WANG[1], Matteo CESCON[1], Dong-Sheng HUANG[1], Timothy M. PAWLIK[1], Wan Yee LAU[1], Feng SHEN[1], Fu-Bao LIU[1], Tian YANG*[1]

[1]Hepatobiliary Surgery, The First Affiliated Hospital Of Anhui Medical University, CHINA

Background : Increased life expectancy and improved perioperative management have resulted in increased utilization of hepatectomy for hepatocellular carcinoma (HCC) among elderly patients. However, individualized model for predicting the surgical safety and efficacy is lacking. The present study aimed to develop a Safety and Efficacy-Associated Risk Calculator for HCC in the Elderly after Resection (SEARCHER).

Methods : From an international multicenter database, elderly patients who underwent curative-intent hepatectomy for HCC were stratified by patient age: 65-69 years, 70-74 years, 75-79 years, and ≥ 80 years. Short- and long-term outcomes among the 4 groups were compared. Univariate and multivariate analyses of risk factors of postoperative major morbidity, cancer-specific survival (CSS), and overall survival (OS) were performed in the training cohort. A nomogram-based online calculator was then constructed and validated in the validation cohort.

Results : With increasing age, the risk of postoperative major morbidity and worse OS increased (P=0.001 and 0.020), but not postoperative mortality and CSS (P=0.577 and 0.890) among patients across the 4 groups. Based on three nomograms to predict major morbidity, CSS and OS, the SEARCHER model was constructed and made available at https://elderlyhcc.shinyapps.io/SEARCHER. The model demonstrated excellent calibration and optimal performance in both the training and validation cohorts, and performed better than the several commonly-used conventional scoring and staging systems of HCC.

Conclusions : With higher potential postoperative major morbidity and worse OS as patients age, the decision whether to perform a hepatectomy for HCC needs to be comprehensively considered in the elderly. The proposed SEARCHER model demonstrated good performance to individually predict safety and efficacy of hepatectomy in elderly patients with HCC.

Corresponding Author : **Tian YANG** (yangtianehbh@smmu.edu.cn)