A calculator to predict benefit from adjuvant transarterial chemoembolization for hepatocellular carcinoma

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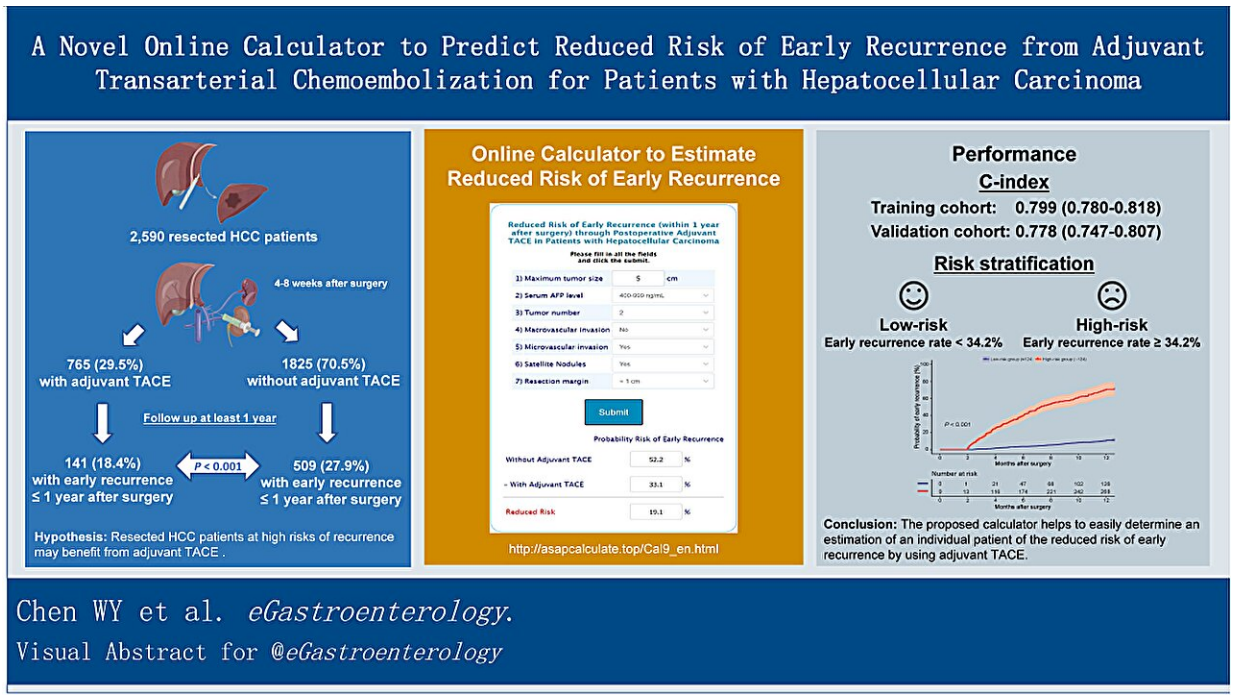

Visual Abstract. Credit: Wei-Yue Chen, Jian-Song Ji, Tian Yang, et al.

Hepatocellular carcinoma (HCC) is the most commonly diagnosed cancer of the liver and the fourth leading cause of cancer-related mortality worldwide, with China accounting for over half of the global annual cases and deaths. Hepatectomy is the standard curative-intent

treatment option for appropriately selected patients with localized HCC.

However, the high postoperative recurrence rate causes many patients to have a poor prognosis and a high incidence of cancer-specific death. This occurs in especially early recurrence within the first year after surgery, which is most likely due to occult micro-metastasis from the original tumor. Given that survival among patients with recurrence is markedly worse than those without, there has been considerable interest in various neoadjuvant and adjuvant treatment approaches to prevent early recurrence following hepatectomy.

In a new paper published in *eGastroenterology*, a team of scientists led by Professor Tian Yang from Eastern Hepatobiliary Surgery Hospital and Professor Jian-Song Ji from Lishui Hospital developed a personalized calculator can be used as a predictive tool for estimating the reduced risk of early recurrence in HCC patients.

No treatment modalities have been widely adopted, and international guidelines recommend none. Identifying specific subsets of HCC patients who are at the highest risk of recurrence and who might preferentially benefit from adjuvant treatment to reduce recurrence, particularly for early recurrence within a short period after surgery, has been a topic of interest.

Transarterial chemoembolization (TACE) performed 4-8 weeks after hepatectomy is an adjuvant treatment used to reduce risks of postoperative recurrence and improve long-term prognosis. In theory, adjuvant TACE can eliminate occult micro-metastasis related to the original tumor, or residual tumors left after surgery, thereby preventing early recurrence after surgery.

Adjuvant TACE's impact in preventing post-hepatectomy recurrence remains controversial. Several single-center randomized controlled trials

(RCTs) reported no benefit or decreased survival using adjuvant TACE. These disappointing results may be related to poor selection criteria. Only a recent comprehensive review on adjuvant TACE suggested that patients at high risk of recurrence benefited from adjuvant TACE.

There has been increasing interest in the development of cancer risk prediction models. These models can be helpful decision-making tools in clinical settings. Such tools may be more reliable than a personal clinical judgment about whether an individual may benefit from adjuvant therapy.

The research team sought to develop a prediction tool to identify HCC patients at high risk of early recurrence after curative hepatectomy. They also aimed to estimate the degree of risk reduction for early recurrence based on adjuvant TACE utilization at the individual patient level. The team developed an Internet browser-based decision calculator to help clinicians make decisions about adjuvant TACE after hepatectomy for HCC.

Postoperative adjuvant therapies predominantly eliminate a microvascular disease originating from the primary tumor or residual foci left after resection for malignant tumors. Adjuvant TACE may be more suitable for patients likely to develop early recurrence after hepatectomy for HCC.

Recent randomized control studies (RCTs) and systematic reviews have indicated that adjuvant TACE was associated with improved long-term survival only in subsets of patients with one or more high-risk characteristics of HCC recurrence but not for patients with no high-risk features. Therefore, predicting individual patient risk of developing postoperative recurrence is of great importance in deciding whether to use adjuvant TACE for patients with HCC.

The study aimed to identify the personalized net benefit by reducing the risk of early recurrence associated with adjuvant TACE for an individual patient undergoing hepatectomy for HCC using a prediction model based on eight independent factors. The model demonstrated good discrimination and calibration, with C-indices greater than 0.75 in training and validation cohorts.

Based on this nomogram formula, a proposed online calculator was created to estimate the probabilities of early recurrence for HCC patients relative to receipt of adjuvant TACE. The difference between the two estimates being the expected benefit from adjuvant TACE. Based on the calculator, patients could be stratified into risk groups relative to early recurrence, which could also categorize the patient risk of CSS.

This model is the first prediction model to estimate the reduced risk of early recurrence from adjuvant TACE among individual patients undergoing hepatectomy for HCC. These data may help clinicians in decision-making about the potential role of adjuvant TACE among patients undergoing hepatectomy for HCC.

More information: Wei-Yue Chen et al, Novel online calculator to predict reduced risk of early recurrence from adjuvant transarterial chemoembolisation for patients with hepatocellular carcinoma, *eGastroenterology* (2023). DOI: 10.1136/egastro-2023-100008

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