Impact of Neoadjuvant Chemotherapy on Postoperative Outcomes for Patients with Colorectal Liver Metastases Undergoing Liver Resection

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We read with great interest the recent study reported by Wiseman and colleagues.[1] Through propensity score matching (PSM) analysis of 3,779 patients, the authors evaluated the impact of neoadjuvant chemotherapy before hepatectomy on postoperative complications in colorectal cancer patients with liver metastases (CRLMs). We appreciated this work, which specified the safety of earlier neoadjuvant chemotherapy of CRLMs receiving hepatectomy. However, we would like to raise the following concerns: First, choosing a sufficient set of covariates for PSM analysis is of great importance, and requires qualitative knowledge of the causal relationships among all the covariates.[2] All of the covariates that can affect study variables should be included in PSM. The PSM analysis in this study enrolled only 5 variables, that is age, concomitant colectomy, type of liver resection, number of tumors resected, and maximum metastatic tumor size in liver.[1] However, other significantly diverse ($p < 0.05$) variables between the 2 groups, including American Society of Anesthesiologists class, weight loss, steroid use, diabetes, hypertension, serum bilirubin, serum albumin, surgical approach, operative time, Pringle maneuver, and concurrent ablation, were not balanced. These factors could impact postoperative complications theoretically, and there might be unbalanced background for comparisons between the 2 groups. Unpairing of these factors might induce the potential biases and undermine the reliability of the study conclusion.[3,4] In addition, significant factors for postoperative complications, including race, weight loss, steroid use, bilirubin, albumin, operative time, Pringle maneuver, and concurrent ablation, were still statistically unpaired after PSM. In conclusion, more variables should be balanced by PSM.

Second, variables, including alanine aminotransferase and aspartate aminotransferase, that are widely used in current clinical practice for accessing liver function were not provided. As mentioned in the article, chemotherapy drugs like oxaliplatin and irinotecan can cause liver injury, including sinusoidal injury and steatohepatitis, respectively.[1] Absence of alanine aminotransferase and aspartate aminotransferase for PSM can influence the postoperative outcomes of hepatectomy and undermine the conclusions of the study. Therefore, we recommended alanine aminotransferase and aspartate aminotransferase be included in PSM analysis.

In summary, we suggest that covariates for PSM analysis contain more relevant variables. In addition, some potentially important variables on patients' baseline characteristics need to be investigated in this study. Clarification about this omission would greatly solidify the conclusions of the study.

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Propensity Score Matching
In Reply to Zhang and colleagues

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We appreciate the comments of Zhang and colleagues in their Letter to the Editor about our recent work "Impact of Neoadjuvant Chemotherapy on the Postoperative Outcomes of Patients Undergoing Liver Resection for Colorectal Liver Metastases: A Population Based Propensity-Matched Analysis."[1] In their letter, Zhang and colleagues raised several questions about the selection

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