



Seeking a better risk-prediction model for upper gastrointestinal bleeding

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See Article on Page 1176-1185

Gastrointestinal hemorrhage is a digestive emergency that requires admission to the hospital [1,2]. The treatment strategy is particularly important during the acute phase because upper gastrointestinal hemorrhage has a higher possibility of fatal massive bleeding compared to lower gastrointestinal bleeding. Several treatment guidelines have been introduced for treating patients with symptoms of gastrointestinal bleeding in the hospital. However, these guidelines do not accurately reflect all of the various aspects of gastrointestinal bleeding, and are thus not always utilized during treatment of these patients. Moreover, the guidelines for risk assessment based on endoscopic findings expose the limitations of the initial risk assessments of patients visiting the emergency room for gastrointestinal bleeding.

In recent large-scale prospective studies, the area under the receiver operating characteristic curve (AUROC) values of the mortality rate within 30 days and need for transfusion or interventions for hemostasis (according to upper gastrointestinal bleeding prediction instruments such as the Glasgow Blatchford score, AIMS65 score, and Rockall scoring system) were 0.69 to 0.86; these lower than expected values indicated that the clinical utility of the AUROC is quite limited [3,4].

Lee et al. [5] were the first to combine

the findings of multidetector computed tomography (MDCT) with the Glasgow Blatchford scoring system. As MDCT greatly contributes to the diagnosis of gastrointestinal bleeding, particularly variceal bleeding, the development of an upper gastrointestinal bleeding score reflecting MDCT findings would help clinicians determine treatment strategies for emergencies. However, it is unclear whether MDCT significantly enhances risk prediction in cases of non-variceal upper gastrointestinal bleeding; the diagnostic rate of MDCT is low in patients with non-variceal gastrointestinal bleeding [6]. Therefore, to develop an improved prognosis prediction system for non-variceal gastrointestinal bleeding, further research is required. In a study comparing the clinical efficacy of old and new scoring systems for non-variceal upper gastrointestinal bleeding, newly developed systems, such as the ABC, a new Japanese scoring system, and the Progetto Nazionale Emorragia Digestiva score better predicted 30-day mortality (AUROC, 0.907), the need for therapeutic intervention (AUROC, 0.707), and rebleeding (AUROC, 0.874), respectively ($p < 0.001$ for all) [7]. However, these newer systems must be validated in large-scale multicenter prospective studies.

Artificial intelligence-based risk-prediction models for upper gastrointestinal bleeding have been suggested [4,8,9]. These models allow for highly accurate risk prediction in patients with upper gas-

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gastrointestinal bleeding. One of these models was used to identify patients with very low bleeding risk [4]. A highly effective risk prediction model would improve the management of patients with gastrointestinal bleeding by identifying those requiring hospitalization or active intervention. Such a model could be applied to patients visiting the emergency room and those seen during outpatient follow-up without hospitalization.

Current risk-prediction models for upper gastrointestinal bleeding are insufficient for determining the optimal acute-stage treatment strategy. Improvements in the resolution of imaging modalities or the introduction of a new modality that reflects the severity of bleeding from the gastrointestinal tract would be desirable. A large-scale prospective study to demonstrate the clinical efficacy of newly developed scoring systems and promote the use of new modalities in conjunction with current scoring systems is warranted.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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