Letter to the Editor

Stroke *welcomes Letters to the Editor and will publish them, if suitable, as space permits. Letters must reference a* Stroke *published-ahead-of-print article or an article printed within the past 4 weeks. The maximum length is 750 words including no more than 5 references and 3 authors. Please submit letters typed double-spaced. Letters may be shortened or edited.*

Letter by Jiang and Peng Regarding Article, "Predicting Intracerebral Hemorrhage Expansion With Noncontrast Computed Tomography: The BAT Score"

To the Editor:

We are pleased to read the recent article by Morotti et al[1] entitled "Predicting Intracerebral Hemorrhage Expansion With Noncontrast Computed Tomography: The BAT Score." Morotti et al developed and validated a convenient hemorrhage expansion (HE) score using 3 well-characterized intracerebral hemorrhage (ICH) cohorts. A blend sign, intrahematoma hypodensity, and baseline noncontrast computed tomography timing were independent predictors included in a 5-point algorithm. A dichotomized BAT score ≥3 predicted HE with a sensitivity of 0.50 and specificity of 0.89.

Up to half of all patients with ICH experience early HE.[2] Because HE is significantly associated with poor outcome and is potentially preventable, rapid identification of patients at high risk for HE is important for development of potential antiexpansion therapies. Time is brain in ICH as well because most of the patients experience HE in the first 6 hours after symptom onset.[2] Therefore, clinicians should identify patients who are at high risk of HE as efficiently as possible for further treatment. If therapies that can benefit these patients are indeed developed in the near future, then an algorithm for screening HE with better sensitivity is urgently needed in clinical practice. The high-specificity BAT score may help optimize the ability to select patients eligible for clinical trials of antiexpansion therapies. However, a sensitivity of 0.50 may not meet the potential clinical needs. Furthermore, similar to troponin T and troponin I in myocardial infarction, a sensitive predictive tool is needed for intracranial HE.

An island sign is the newest identified noncontrast computed tomography predictor of HE.[3] Morotti et al[1] did not preselect this predictor variable, perhaps because their work had already begun when the island sign was confirmed. To date, several noncontrast computed tomography markers have been introduced for prediction of HE, including the blend sign, intrahematoma hypodensity, irregular hematoma shape, heterogeneous hematoma density, and the presence of a fluid level.[4] These markers appear to be independent predictors of HE and seem to have no interactions. It is not ruled out that new image markers may be found in the near future, and the existing scores may not follow the pace of any new markers. In addition, as the author said, "these markers were analyzed by raters with a strong expertise in ICH neuroimaging," and "it remains unclear whether rapid and accurate identification of these noncontrast computed tomography markers is possible for raters with less experience."[1] In the future, the development of mechanical learning may serve as a better approach to help updates of algorithms and identification of markers.

In conclusion, the work of Morotti et al has made an important contribution to the literature on predictors of HE. Their findings may have relevant implications for future ICH research.

Disclosures

None.

Nan Jiang, MD
Bin Peng, MD
Department of Neurology
Peking Union Medical College Hospital
Chinese Academy of Medical Sciences
Beijing, China

References

1. Morotti A, Dowlatshahi D, Boulouis G, Al-Ajlan F, Demchuk AM, Aviv RI, et al; ATACH-II, NETT, and PREDICT Investigators. Predicting intracerebral hemorrhage expansion with noncontrast computed tomography: the BAT score. *Stroke*. 2018;49:1163–1169. doi: 10.1161/STROKEAHA.117.020138
2. Brouwers HB, Greenberg SM. Hematoma expansion following acute intracerebral hemorrhage. *Cerebrovasc Dis*. 2013;35:195–201. doi: 10.1159/000346599
3. Li Q, Liu QJ, Yang WS, Wang XC, Zhao LB, Xiong X, et al. Island sign: an imaging predictor for early hematoma expansion and poor outcome in patients with intracerebral hemorrhage. *Stroke*. 2017;48:3019–3025. doi: 10.1161/STROKEAHA.117.017985
4. Morotti A, Boulouis G, Romero JM, Brouwers HB, Jessel MJ, Vashkevich A, et al; ATACH-II and NETT Investigators. Blood pressure reduction and noncontrast CT markers of intracerebral hemorrhage expansion. *Neurology*. 2017;89:548–554. doi: 10.1212/WNL.0000000000004210

(*Stroke*. 2018;49:00-00. DOI: 10.1161/STROKEAHA.118.022111.)

Stroke
Journal of the American Heart Association

Letter by Jiang and Peng Regarding Article, "Predicting Intracerebral Hemorrhage Expansion With Noncontrast Computed Tomography: The BAT Score"

Nan Jiang and Bin Peng

Stroke. published online July 5, 2018;
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

Print ISSN: 0039-2499. Online ISSN: 1524-4628