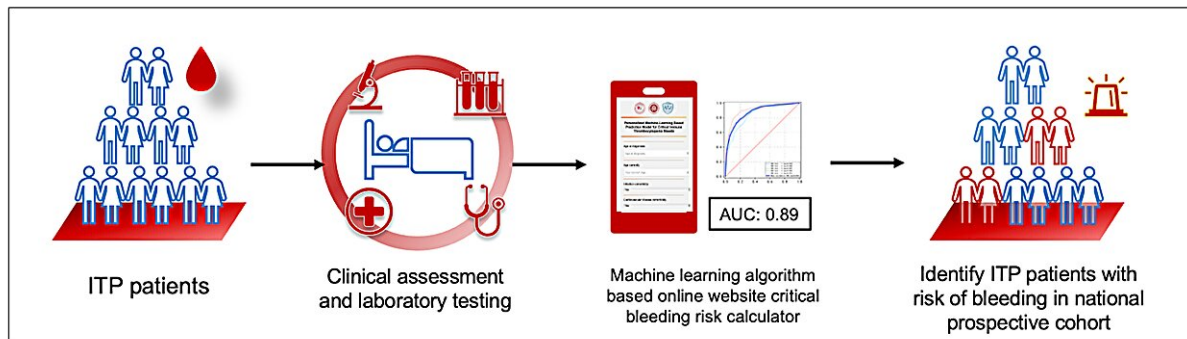


New study reveals promising machine learning model for predicting critical bleeding in immune thrombocytopenia patients

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The machine learning-based online application for predict critical immune thrombocytopenia (ITP) bleeding exhibited good predictive capabilities for training, validation, and test datasets. This convenient web-based tool based on a novel algorithm can rapidly identify the bleeding risk profile of patients with ITP and facilitate clinical decision-making and reduce the occurrence of adversities. Credit: Science China Press

Researchers have developed a machine learning model that shows promising results in predicting the risk of critical bleeding in patients with immune thrombocytopenia (ITP).

By analyzing 10 simple and readily available predictors, the model provides accurate predictions and could potentially support clinicians in making informed decisions regarding patient management and reducing adverse outcomes. The study, conducted on a large cohort of ITP patients, highlights the significance of machine learning in improving [risk assessment](#) and [patient care](#) in ITP.

The machine learning model, trained on retrospective and prospective cohorts, demonstrated robust performance in predicting the occurrence of critical bleeding events. The selected predictors included infection, uncontrolled diabetes mellitus, current age, ITP type, [cardiovascular disease](#), low absolute lymphocyte count (ALC), skin and mucosa bleeding, initial platelet count (PLT), low PLT, and disease duration. These predictors were carefully chosen based on their clinical relevance and [statistical significance](#).

Validation of the model was conducted using various statistical measures, including the area under the receiver operating characteristic curve (AUC). The AUC values for the model exhibited strong discriminatory power, indicating its effectiveness in differentiating between patients at high and low risk of critical bleeding. Furthermore, calibration plots were generated to assess the model's calibration accuracy, showing a close alignment between predicted and observed bleeding risks.

The study's findings highlight the potential of this [machine learning model](#) as a [valuable tool](#) in predicting critical bleeding events in ITP patients. By leveraging easily accessible clinical variables, the model can be implemented in routine clinical practice to support physicians in risk stratification and decision-making. The development of a web-based online tool based on this algorithm could provide rapid risk profiling and contribute to improved patient outcomes in ITP management.

The research is published in the journal *Science Bulletin*.

More information: Zhuo-Yu An et al, A life-threatening bleeding prediction model for immune thrombocytopenia based on personalized machine learning: a nationwide prospective cohort study, *Science Bulletin* (2023). [DOI: 10.1016/j.scib.2023.08.001](https://doi.org/10.1016/j.scib.2023.08.001)

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