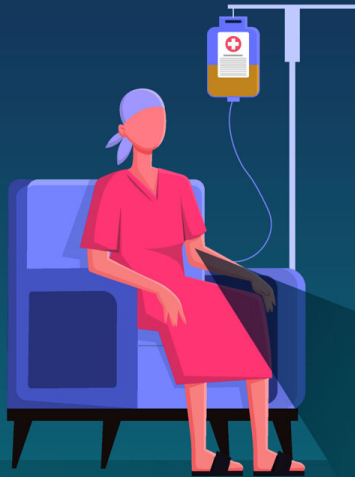


# Researchers develop new risk score for predicting blood cancer relapse

June 24 2021

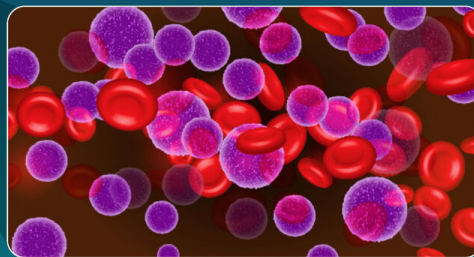
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# Novel Risk Score to Predict B-Cell Acute Lymphoblastic Leukemia Relapse



Several patients with B-cell acute lymphoblastic leukemia (B-ALL) who have undergone allogeneic stem cell transplantation (allo-SCT) face the risk of relapse

Better relapse prediction would allow better medical intervention



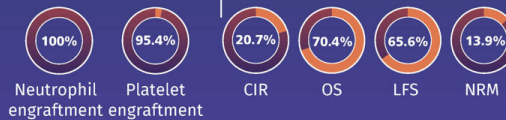
What would be an effective risk score to predict leukemia relapse?



Retrospective study of 477 patients with B-ALL, who underwent allo-SCT

2010  
↓  
2015

Percentage of patients showing 5-year



Association between

Factors ↔ Outcomes measured for 5 years

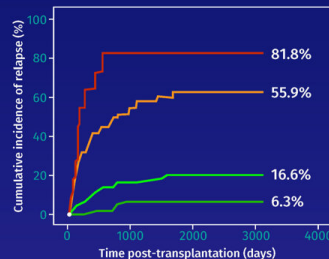
Neutrophil engraftment	Cumulative incidence of relapse (CIR)
Platelet engraftment	Overall survival (OS)
Minimum residual disease (MRD)	Leukemia-free survival (LFS)
Complete remission (CR)	Non-relapse mortality (NRM)
Chronic graft-versus-host disease (cGVHD)	

3-point risk score reflecting 5-year outcomes

Observed association between factors and outcomes

+MRD ↔ ↑ CIR ≥CR2 ↔ ↓ LFS -cGVHD ↔ ↓ OS

Novel risk score



The novel risk score could guide leukemia treatment by allowing stratification of patients who have undergone allo-SCT, depending on how relapse-prone they are

A risk score system for stratifying the risk of relapse in B cell acute lymphocytic leukemia patients after allogeneic stem cell transplantation  
Cao et al. (2021) | 10.1097/CM9.0000000000001402

@ChineseMedicalJournal  
@ChinMedJ



Is it possible to "predict" the relapse of leukemia after stem cell transplantation? A new study published in Chinese Medical Journal describes a novel "risk score" for relapse. Credit: Chinese Medical Journal

Leukemia is a group of blood cancers that affects thousands of people worldwide. However, with advances in medicine, several different types of leukemia can be effectively treated with donor stem cells through allogeneic stem cell transplantation (allo-SCT). One such type of leukemia is B-cell acute lymphoblastic leukemia (B-ALL), which is caused by uncontrolled proliferation and prolonged existence of cancerous B-cells. While allo-SCT can "cure" B-ALL in several cases, there are also cases of failure, characterized by deterioration in health after a period of recovery—a phase medically known as relapse. Early prediction of this unfavorable outcome can have several medical advantages for the corresponding patients and the healthcare system.

To address this challenge, a group of medical researchers from Beijing Key Laboratory of Hematopoietic Stem Cell Transplantation, Peking University, and Chinese Academy of Medical Sciences successfully have developed an effective risk score that can accurately predict [leukemia](#) relapse after allo-SCT. Their findings have been published as a research article in *Chinese Medical Journal*.

Detailing the comprehensive methodology used in the study, Dr. Xiao-Jun Huang from Peking University Institute of Hematology, Peking University People's Hospital, who led the study, explains, "We enrolled 477 patients with B-ALL who underwent allo-SCT at Peking University People's Hospital from December 2010 to December 2015 in this retrospective study. We aimed to evaluate the factors associated with

transplant outcomes after allo-SCT and establish a risk score to identify patients with different probabilities of relapse. We performed univariate and multivariate analyses with the Cox proportional hazards model using time-dependent variables to analyze our data."

As mentioned by Dr. Huang, some of the analyzed factors associated with allo-SCT transplant outcomes included engraftment of white blood cell-like neutrophils and platelets in the patients; presence of residual cancer cells, measured as minimal residual disease (MRD); occurrence of chronic graft-versus-host disease (cGVHD); and decrease in leukemia symptoms, medically known as remission, after the procedure. Then, the researchers went on to identify whether these factors could be used to determine outcomes such as 5-year cumulative incidence of relapse (CIR), overall survival (OS), leukemia-free survival (LFS), and non-relapse mortality in the patients. Finally, these results were used to formulate the risk score.

In the patients assessed for the different factors previously described, the researchers notably observed that all of them achieved neutrophil engraftment, and 95.4% of them achieved platelet engraftment. Also, they observed that 20.7% of the patients showed CIR, 70.4% of them survived overall, 65.6% endured LFS, and 13.9% succumbed to non-relapse mortality.

Further [statistical analysis](#) allowed the researchers to observe distinct associations between the analyzed factors and evaluated outcomes. In this regard, Dr. Huang, excitedly explains, "Our analysis showed that patients with positive post-transplantation MRD, transplanted beyond the first complete remission (CR2), and without cGVHD, had higher CIR and worse LFS and OS, than did patients without MRD after transplantation, transplanted in CR1, and with cGVHD." With such apparent observations, as explained by Dr. Huang, the researchers immediately went on to devise their risk score.

The novel risk score pinned 5-year relapse rates of 6.3%, 16.6%, 55.9%, and 81.8%, as 0, 1, 2, and 3, respectively. The researchers also added that with increasing risk score, the 5-year LFS and OS values correspondingly decreased.

Overall, the researchers hope that the risk score that they have devised will serve as a guide for leukemia treatment, by allowing stratification of patients with different risks of relapse. They also hope that this will allow for better medical intervention. Indeed, the world can hope that this risk score serves a milestone in leukemia [relapse](#) prediction.

**More information:** Le-Qing Cao et al, A risk score system for stratifying the risk of relapse in B cell acute lymphocytic leukemia patients after allogeneic stem cell transplantation, *Chinese Medical Journal* (2021). [DOI: 10.1097/CM9.0000000000001402](https://doi.org/10.1097/CM9.0000000000001402)

Provided by Chinese Medical Journal

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