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POSTER ABSTRACTS

721.ALLOGENEIC TRANSPLANTATION: CONDITIONING REGIMENS, ENGRAFTMENT AND ACUTE TOXICITIES

Risk Factors and Prognostic Model for II-IV aGVHD in Patients with Engraftment Syndrome after Haploidentical Hematopoietic Stem Cell Transplantation

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Background
Engraftment syndrome (ES), characterized by noninfective fever, rash, noncardiogenic pulmonary edema, hepatic dysfunction and weight gain, is a common complication after haplo-HSCT. Although ES has been reported in the previous literature, there is still no consensus on the risk factors, outcomes and treatment of ES, as there is not only a lack of uniformity described by authors but also conflicting evidence between studies. One meta-analysis found that patients with ES have significantly higher odds of developing aGVHD than patients without ES. However, a strategy for identifying high-risk patients with ES for aGVHD remains unclear although important for early aGVHD prevention and the improvement of patient outcomes. Here, we retrospectively analyzed a large cohort of posthaplo-HSCT ES patients and described the risk factors, outcomes and prognostic model for II-IV aGVHD in patients with ES.

Methods
A total of 384 patients with ES after haplo-HSCT at Peking University People's Hospital between 2013 and 2022 were retrospectively identified. We first performed a nested case–control study to identify the risk factors for ES, and three controls were randomly selected for each case according to the time of transplant and the length of follow-up. The cohort of ES patients was further divided into a derivation cohort of 258 patients and a validation cohort of 126 patients. We used a logistic regression model to perform univariate and multivariate analyses to determine the risk factors and prognostic factors for II-IV aGVHD in patients with ES after haplo-HSCT. The prognostic model performance was assessed by evaluating the discrimination [area under the curve (AUC)], calibration (calibration plot), and net benefit [decision curve analysis (DCA)].

Results
In 384 patients diagnosed with ES after haplo-HSCT, the median diagnostic time of ES was 11 days after haplo-HSCT, close to the time of neutrophil engraftment. Among them, 252 (65.6%) patients developed aGVHD, and 123 (32.0%) suffered II-IV aGVHD. The 3-year survival rate of ES patients who developed II-IV aGVHD was 17.1% (21/123) compared with 4.3% (11/252) in those without II-IV aGVHD (p<.001).Through multivariable logistic binary regression models, six prognosis risk factors were selected,including age at HSCT≤25 years(p=0.008; odds ratio [OR], 4.47; 95% confidence interval [CI], 1.54-14.30), obesity (BMI≥28) at HSCT(p=0.039; OR, 12.60; 95% CI, 1.30-194.14), previous pregnancy history (p=0.09; OR, 3.42; 95% CI, 0.83-18.45), time from diagnosis to transplantation≥6 months (p=0.027; OR, 2.73; 95% CI, 0.97-8.50), a high dose of MNC administration (≥9×10^{8})(p=0.003; OR, 4.39; 95% CI, 1.70-12.41) and a high dose platelet transfusion (≥2u) during conditioning regimen (p=0.007; OR, 4.04; 95% CI, 1.51-11.73). According to the regression coefficient, 2 scores were assigned for obesity at HSCT, and 1 score was assigned for the other risk factors. Hence, a prognostic model for II-IV aGVHD termed TOPMAP (**t**ime

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from diagnosis to transplantation, **o**besity, **p**revious pregnancy history, high-dose **M**NC administration, **a**ge, and high-dose **p**latelet transfusion) was constructed. Patients were stratified into 3 risk groups: low risk (0-2), intermediate risk (3-4), and high risk (5-7), which showed an incidence of II-IV aGVHD of 15.9% for low risk, 39.2% for intermediate risk, and 83.3% for high risk ($P<0.001$). The AUCs of the prognostic scoring model were 0.816 (95% CI 0.727-0.903) and 0.813 (0.759-0.868) for the internal validation and validation cohorts, respectively. The calibration plots showed a high agreement between the predicted and observed outcomes. Decision curve analysis indicated that patients with engraftment syndrome could benefit from the clinical application of the prognostic model.

Conclusion

Here, we reported the largest study on ES posthaplo-HSCT and found risk factors for ES onset. We developed the first straightforward scoring model (designated TOPMAP) that incorporates clinical and laboratory risk factors to predict the high-risk group for II-IV aGVHD in patients with ES after haplo-HSCT. This model can effectively help clinicians identify ES patients early, sectionalize them according to risk for II-IV aGVHD, carry out aGVHD prevention and improve patient outcomes.

Disclosures No relevant conflicts of interest to declare.

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