Barriers to Receiving Allogeneic Hematopoietic Cell Transplantation for Acute Myeloid Leukemia: Insights from a Large-Scale Multi-Center Observational Study

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INTRODUCTION

The decision on whether patients with acute myeloid leukemia (AML) should proceed with allogeneic hematopoietic cell transplantation (allo-HCT) involves complex considerations.

AIM

We aim to examine how patient health factors and clinician assessments influence this decision.

METHOD

Our prospective, multicenter observational study included 695 adults with AML, conducted across 13 predominantly academic centers. Data on demographics, cytogenetic risks, treatment responses, and geriatric assessment were collected at enrollment and at intervals of 1, 3, 6, 9, 12, 18, and 24 months. Competing risk Cox regression analysis was used to evaluate factors influencing mortality and HCT receipt.

RESULTS

By 9 months, 43% of participants had undergone HCT. In participants who did not undergo HCT, multivariable analysis identified factors associated with increased risk of mortality, including high HCT-comorbidity index scores (HR, 2.11; $P<0.0001$); age >50 years, particularly for those ≥70 years who had a higher risk (HR, 2.71; $P<0.0001$); intermediate- (HR, 2.43; $P=0.0003$) and adverse-risk (HR, 4.3; $P<0.0001$) ELN cytogenetics; R/R disease at enrollment (HR, 2.04; $P<0.0001$); low- intensity chemotherapy regimens (HR, 1.42; $P=0.04$); dependence in activities of daily living <14 (HR, 1.59; $P=0.005$); and depression measured by PHQ-9 (HR, 1.56; $P=0.009$). Among those who survived long enough to potentially receive allo-HCT, factors associated with not receiving HCT were age ≥70 years (HR, 1.56; $P=0.009$), low ELN risk (HR, 0.28; $P<0.0001$), low- intensity induction (HR, 0.56; $P=0.02$), poor Karnofsky performance status (≤70) (HR, 0.49; $P=0.0005$), and relapse after achieving CR1 (HR, 0.41; $P=0.001$). Among patients aged ≥60 years, impaired cognition using Blessed Orientation-Memory- Concentration test (HR, 0.45; $P=0.007$) and impaired hearing (HR, 0.71; $P=0.009$) independently reduced chances of receiving HCT. Patients who were more likely to receive HCT had high-risk MDS (HR, 2.43; $P<0.0001$), had R/R disease when first seen at the center (HR, 2.43; $P<0.0001$) versus newly diagnosed AML, or were in CR1 after induction (HR, 4.59; $P<0.0001$) versus CR2 or later.

CONCLUSIONS

Multiple factors influence HCT receipt and mortality of patients with AML. A significant age-related disparity against those older than 70 years or with aging-associated vulnerabilities were noted. Multiple modifiable other patient-related factors limit chances to receive HCT. Future efforts will address roles of social determinants in likelihood of HCT recipients and novel trials to enhance patient readiness for HCT.