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ORIGINAL ARTICLE

Allogeneic transplantation of bone marrow versus peripheral blood stem cells from HLA-identical relatives in patients with myelodysplastic syndromes and oligoblastic acute myeloid leukemia: a propensity score analysis of a nationwide database

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Abstract

Bone marrow (BM) and granulocyte colony-stimulating factor-mobilized peripheral blood stem cells (PBSC) are used as grafts from HLA-identical-related donors for adults with myelodysplastic syndrome (MDS). To assess the impact of graft sources on post-transplant outcomes in MDS patients, we conducted a retrospective analysis of a nationwide database. A total of 247 and 280 patients underwent transplantation with BM and PBSC, respectively. The inverse probability of treatment weighting (IPTW) methods revealed that overall survival (OS) was comparable between BM and PBSC ($P = .129$), but PBSC transplantation was associated with worse graft-versus-host disease (GVHD)-free/relapse-free survival (GRFS) (hazard rate [HR], 1.24; 95% confidence intervals [CIs], 1.00–1.53; $P = 0.049$) and chronic GVHD-free and relapse-free survival (CRFS) (HR, 1.29; 95% CIs, 1.13–1.73; $P = 0.002$) than BM transplantation. In the propensity score matched cohort (BM, $n = 216$; PBSC, $n = 216$), no significant differences were observed in OS and relapse; 3-year OS rates were 64.7% and 60.0% ($P = 0.107$), while 3-year relapse rates were 27.1% and 23.5% ($P = 0.255$) in BM and PBSC, respectively. Three-year GRFS rates (36.6% vs. 29.2%; $P = 0.006$), CRFS rate (37.7% vs. 32.5%; $P = 0.003$), and non-relapse mortality rates (13.9% vs. 21.1%; $P = 0.020$) were better in BM than in PBSC. The present study showed that BM transplantation provides a comparable survival benefit with PBSC transplantation and did not identify an enhanced graft-versus-MDS effect to reduce the incidence of relapse in PBSC transplantation.

Keywords Myelodysplastic syndrome · Allogeneic hematopoietic stem cell transplantation · Propensity score · Bone marrow · Peripheral blood stem cells

Introduction

Bone marrow (BM) and granulocyte colony-stimulating factor-mobilized peripheral blood stem cells (PBSC) represent graft sources in allogeneic hematopoietic stem cell transplantation (allo-HSCT) from human leukocyte antigen (HLA)-matched-related donors. Several randomized trials have been conducted to establish whether PBSC is preferred over BM in allo-HSCT using HLA-matched-related donors [1–7]. PBSC transplantation correlated with faster engraftment, a higher incidence of graft-versus-host disease (GVHD), and a lower incidence of relapse than BM transplantation [1–6, 8]. These studies included patients with hematological malignancies, mainly chronic myeloid leukemia and acute myeloid leukemia (AML), who received conventional myeloablative conditioning (MAC) regimens [1–6].

Myelodysplastic syndromes (MDS) are clonal hematopoietic disorders with ineffective hematopoiesis, marrow dysplasia, and a high risk of transformation to AML [9–11]. Allo-HSCT offers the only curative potential for MDS patients via the graft-versus-MDS effect [12–18]. In the past decade, PBSC from HLA-matched-related donors are being increasingly used to treat adult patients with hematological

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