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POSTER ABSTRACTS

723.ALLOGENEIC TRANSPLANTATION: LONG-TERM FOLLOW-UP AND DISEASE RECURRENCE

Outcomes of Hematopoietic Cell Transplantation for Patients with Refractory Cytopenia with Multilineage Dysplasia: A Comparison Children with Adolescents and Young Adults

Asahito Hama[1], Nao Yoshida, MD PhD[1], Daisuke Hasegawa, MD PhD[2], Motohiro Kato, MD PhD[3], Kenichiro Watanabe, MD PhD[4], Daiichiro Hasegawa, MD PhD[5], Tetsuya Nishida, MD PhD[6], Noriko Doki, MD PhD[7], Maho Sato, MD PhD[8], Yasushi Onishi, MD PhD[9], Takuro Nishikawa, MD PhD[10], Hiroshi Tujimoto, MD PhD[11], Katsuyoshi Koh, MD PhD[12], Tetsuya Mori, MD PhD[13], Koji Kato, MD PhD[14], Yoshiko Hashii, MD PhD[15], Atsushi Sato, MD PhD[16], Ken Tabuchi, MD PhD[17], Jun Aoki, MD PhD[18], Shohei Yamamoto, MD PhD[19]

[1] Department of Hematology and Oncology, Children's Medical Center, Japanese Red Cross Aichi Medical Center Nagoya First Hospital, Nagoya, JPN
[2] Department of Pediatrics, St. Luke's International Hospital, Tokyo, JPN
[3] Department of Pediatrics, Tokyo University, Tokyo, JPN
[4] Department of Hematology and Oncology, Shizuoka Children's Hospital, Shizuoka, JPN
[5] Hematology and Oncology,, Hyogo Prefectural Kobe Children's Hospital, Kobe, Japan
[6] Department of Hematology, Japanese Red Cross Aichi Medical Center Nagoya Daiichi Hospital, Nagoya, Japan
[7] Hematology Division, Tokyo Metropolitan Cancer and Infectious Diseases Center Komagome Hospital, Tokyo, Japan
[8] Department of Hematology/Oncology, Osaka Women's and Children's Hospital, Izumi, JPN
[9] Department of Hematology, Tohoku University Hospital, Sendai, Japan
[10] Department of Pediatrics, Kagoshima University Graduate School of Medical and Dental Hospital, Kagoshima, JPN
[11] Department of Pediatrics, Wakayama Medical University, Wakayama, Japan
[12] Department of Hematology/Oncology, Saitama Children's Medical Center, Saitama, Japan
[13] Department of Pediatrics, St. Marianna University School of Medicine, Kanagawa, JPN
[14] Central Japan Cord Blood Bank, Seto, JPN
[15] Department of Pediatrics, Osaka International Cancer Institute, Osaka, JPN
[16] Department of Hematology and Oncology, Miyagi Children's Hospital, Sendai, Japan
[17] Japanese Data Center for Hematopoietic Cell Transplantation, Nagakute, Japan
[18] Department of Hematology, Kanto Rosai Hospital, Kawasaki, Japan
[19] Department of Pediatrics, Tokai University Hospital, Isehara, JPN

Background: The 2008 World Health Organization (WHO) classification proposed a new entity in childhood myelodysplastic syndrome (MDS), refractory cytopenia of childhood (RCC). The spectrum of patients with RCC is wide, ranging from patients with severe hypocellular bone marrow (BM) and mild dysplasia (hypocellular RCC) to those with normocellular BM and distinct dysplasia meeting the criteria for refractory cytopenia with multilineage dysplasia (RCMD) defined for adults with MDS. The term of RCMD was revised to MDS with multilineage dysplasia in the 2017 WHO classification. In Japan, children who meet the criteria for RCMD have been diagnosed as RCMD distinguished from hypocellular RCC. Although hematopoietic cell transplantation (HCT) is a curative treatment for RCMD in children, there have been few reports of the outcomes of HCT for children with RCMD.

Patients and Methods: To clarify the outcomes of HCT for children with RCMD, we retrospectively analyzed the clinical data in children (<16 years) with RCMD who underwent the first HCT from 2010 to 2021 and registered in the Japan Society for Hematopoietic Cell Transplantation Registry, and compared with those in adolescents and young adults (AYA; ≥16, <40 years) with RCMD who underwent the first HCT during the same study period. During the study period, 195 patients with RCMD (children, 69; AYA, 126) underwent HCT. The stem cell source was BM in 138 (children, 58; AYA, 80), peripheral blood (PB) in 27 (children, 2; AYA, 25), and cord blood (CB) in 30 patients (children, 9; AYA, 21). Myeloablative conditioning (MAC) regimen was defined as the use of total body irradiation (TBI) ≥8 Gy (MAC-TBI) and the administration of busulfan (BU) >8 mg/kg (MAC-BU). All other regimens were included in reduced intensity conditioning (RIC) regimen.

Results: We retrospectively analyzed 195 patients with RCMD (male, 105; female, 90). The median age at HCT was 8 years (range, 0-15) in children and 29 years (range, 16-39) in AYA. Of the 195 patients, 20 (29%) and 52 (41%) had abnormal karyotypes in children and AYA, respectively. Of the patients who underwent HCT, 68 were from related (children, 22; AYA, 46), and 127 from unrelated (children, 47; AYA, 80) donors. MAC-BU was used for 46 (children, 9; AYA, 37), MAC-TBI for 51 (children, 1; AYA, 50), and RIC for 98 (children, 59; AYA, 39) patients. Of the 195 patients, 8 (children, 3; AYA, 5) developed primary graft failure, 16 (children, 5; AYA, 11) secondary graft failure, 10 (children, 3; AYA, 7) disease relapse, and 11 (children, 2; AYA, 9) secondary tumor. Twenty-four (children, 5; AYA, 19) patients died of HCT-related complications and four AYA of disease relapse. The 5-year overall survival (OS) rate was significantly higher in children (93%) than in AYA (82%) ($p = 0.04$). The 5-year event-free survival (EFS) rate was 76% in children and 64% in AYA. The 1-month cumulative incidence (CI) of neutrophil engraftment was 93% in children and 94% in AYA. The 5-year CI of relapse was 6% in AYA and 2% in children. The 5-year CI of treatment-related mortality (TRM) was 16% in AYA and 7% in children. The 5-year CI of graft failure was 12% in children and 12% in AYA. The 3-year CI of chronic graft-versus-host disease (GVHD) was significantly higher in AYA (37%) than in children (21%) ($p = 0.04$), while there was no difference in the 3-month CI of acute GVHD (grade II-IV) between children (35%) and AYA (39%). In children, the 5-year OS and EFS rates were significantly lower in CB (67% and 42%) than in BM/PB (97% and 81%) ($p < 0.01$ and $p < 0.01$), respectively, while the 5-year OS and EFS rates were not different between CB (91% and 76%) and BM/PB (80% and 62%) in AYA, respectively. Of the 59 children who underwent HCT using RIC, 43 without abnormal karyotypes showed 95% and 16 with abnormal karyotypes showed 88% in the 5-year OS rate. Even in AYA, there was no difference in the 5-year OS rate between RIC and MAC in both groups with (RIC, $n = 14$, 76%; MAC, $n = 38$, 72%) and without (RIC, $n = 25$, 81%; MAC, $n = 49$, 90%) abnormal karyotypes.

Conclusions: HCT for children with RCMD showed better OS rate than that for AYA with RCMD. HCT using RIC regimen provided good outcomes for RCMD in children with or without abnormal karyotypes. Even in AYA, HCT using RIC regimen showed OS rate comparable to MAC regimen in both groups with and without abnormal karyotypes.

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