PB) for transplantation, allele-matched marrow or peripheral blood is generally regarded as the preferred graft source. Our aim is to compare leukemia-free survival after transplantation of unrelated donor UCB and allele-matched BM/PB, and to provide guidelines for selection of an appropriate donor and graft source in children with acute leukemia.
Patients and methods: Outcomes of 22 children with acute leukemia and transplanted with single unit UCB were compared with outcomes of 34 BM/PB recipients. All transplantations were performed in Samsung Medical Center between May 2003 and June 2009. Recipients of UCB were transplanted with grafts that were HLA-matched (n = 3) or HLA-mismatched for one (n = 15) or two antigens (n = 4). BM/PB recipients were transplanted with grafts that were HLA-matched (n = 20) or mismatched (n = 14). While allele-level typing for HLA-A, HLA-B, HLA-DRB1 and antigen-level typing for HLA-C was used for BM/PB transplantation, antigen level typing for HLA-A, HLA-B and HLA-DRB1 was used for UCB transplantation.
Results: The median times to neutrophil and platelet recovery were 15 (range 10–21) and 22 (12–29) days after BM/PB transplantation, and 17 (13–44) and 34 (24–148) days after UCB transplantation, respectively. The 4-year probabilities of leukemia-free survival were 58.0% after HLA-matched BM/PB transplants, 65.9% after HLA-mismatched BM/PB transplants, 66.7% after HLA-matched UCB transplants, 67.5% after one-mismatched UCB transplants with high cell dose (NC > 3.0×10^7/kg), 40.0% after one-mismatched UCB transplants with low cell dose (NC < 3.0×10^7/kg), and 33.3% after two-mismatched UCB transplants. The incidence of grade 3–4 acute graft-versus-host disease (GVHD) were 12.1% after BM/PB transplantation and 5.3% after UCB transplantation, respectively (P = 0.64). Rates of extensive chronic GVHD were 53.8% after BM/PB transplantation and 23.1% after UCB transplantation, respectively (P = 0.09). Transplant-related mortality rates were higher after UCB transplantation (21.7%) than BM/PB transplantation (2.9%) (P = 0.03). Relapse rates were similar after BM/PB transplantation (29.4%) and UCB transplantation (21.7%) (P = 0.56).
Conclusion: These results support the use of HLA-matched or one-antigen HLA mismatched UCB in children with acute leukemia who need transplantation.

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Successful enhancement of stem cell mobilization in G-CSF mobilized allogeneic donors by application of plerixafor (AMD 3100)

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Background: Engraftment and outcome after allogeneic peripheral blood stem cell (PBSC) transplantation are closely related to the dosage of CD 34+ cells in the graft. Until now, “poor mobilizers” among allogeneic donors remain difficult to identify ‘a priori’ and alternative salvage mobilizing agents would be highly desirable.
Methods: We report on 4 allogeneic female donors (age 25–70 a) who did not respond sufficiently to our standard mobilization protocol (G-CSF, lenograstim 7.5–10 µg/kg 5 days). Plerixafor was administered within a compassionate use programme during a 2nd course of stem cell mobilization on day 4 (10 p.m.) at a dosage of 240 µg/kg in 2 donors. In the other 2 donors plerixafor was administrated during the 1st course of stem cell mobilization at 10 p.m. on day 5 because of a very low stem cell yield after the 1st apheresis. Written informed consent was obtained from all participating individuals. 2 grafts underwent T-cell depletion because of HLA-mismatch. Recipients (3 males, 1 female) suffered from acute myeloid leukemia (AML, n = 2), high-grade non Hodgkin lymphoma (NHL) and chronic myeloid leukemia (CML).
Results: Apheresis yields with G-CSF alone and after administration of G-CSF and plerixafor are shown in table 1. The amount of CD 34+ cells collected could be enhanced by 167% to 300% by the addition of plerixafor. All donors reported only mild or no side effects after receiving plerixafor. All 4 recipients had been transplanted with these grafts and showed timely and sustained trilineage engraftment.
Conclusion: Our preliminary data suggest that the administration of G-CSF and plerixafor may be a successful and well-tolerated regimen for PBSC mobilization in allogeneic donors who do not achieve a given CD34+ PBSC target with G-CSF alone. The stem and progenitor cells obtained by this strategy seem to have a high engraftment potential. This novel approach could possibly avoid graft failure in the recipients and the need for bone marrow collection in poor mobilizing allogeneic donors and should therefore be further evaluated in future studies.

Donor	age	Courses of mobilization	CD 34 yield with G-CSF x10^6/kg	CD 34 yield with G-CSF + plerixafor x10^6/kg	Disease and outcome of recipient
142007	43	2	3.5**	7.54* (215%)	AML; Engraftment***, dead from extramedullary relapse 6 months after Tx
200108	70	2	4.2**	8.88* (211%)	AML, Engraftment, alive 10 months after Tx
021108	67	1	1.8*	3.0* (167%)	NHL, Engraftment, dead from acute GvHD after DLI 8 months after Tx
152009	25	1	1.8*	5.4* (300%)	Engraftment, alive, 4 weeks follow up ***

*single apheresis **double apheresis (cumulative yield) *** T-Cell depleted graft

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Influence of filgrastim mobilization of HLA identical familiar healthy stem cell donor in allogneic transplant setting

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Mobilized peripheral blood stem cells (PBSC) have become an increasingly used alternative to bone marrow for allogeneic transplantation. Granulocyte colony-stimulating factor (G-CSF) –primed peripheral stem cells harvesting may result in a graft with increased mononuclear cells collected, increased progenitor cell dose and potential for more rapid engraftment resulting in improved survival. Filgrastrim is not only known to mobilize CD34+ progenitor cells but acts as a pleiotropic immune modulator. So, systematic donor follow-up in healthy donors is needed.
The aim of this study is to evaluate safety and feasibility of G-CSF primed hematopoietic peripheral stem cells in familiar HLA-identical donors. The follow-up focused on laboratory testing including reports of adverse event.
Granulocyte colony-stimulating factor (G-CSF) is administrated in 49 healthy donors to reach sufficient mobilization in the period 2000–2009. The donors were characterized as follows: 43 years median; female 60% of the donors. G-CSF was administrated in the dose 10 µg/kg of donor weight in five day and PBSC collections started on the fifth day using COBE Spectra cell separator. The aim was to collect mononuclear cells 2×10^8/kg of recipient weight. Three donors were mobilized twice (for second transplant). Aphaeresis needed to reach target number of CD34+ cells were: 1 apherese in 50%, more than two apherese need in only 1 patient. The most frequent adverse event that was noted by patients was bone pain associated with increasing number of white blood cells. Better mobilization and higher PBSC yield correlated significantly with younger age. Four years after G-CSF –primed peripheral stem cells harvesting, a young female 48 years old was diagnosed with acute myeloblastic leukemia. Four years ago when she was 44 years old, she donated for her HLA identical sister with acute myeloblastic leukemia.
G-CSF is safe and very effective for PBSC mobilization in our healthy donors. This method allows certain collections of sufficient numbers of progenitors in virtually all donors. We demonstrated that filgrastim mobilization for peripheral blood stem collection is effective and result with successful engraftment in all the recipients. Daily injection of 10 µg/kg of G-CSF and first aphaeresis preformed at day 5 seems to be the best strategy to obtain the CD34+ cell count required for an allogeneic hematopoietic stem cell graft.