Mesenchymal stem cell chimerism following HSCT

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Although there is experimental evidence suggesting the presence of a common mesoderm cell as origin of both hematopoietic (HSC) and mesenchymal progenitor cells (MSC) in an animal model, it is still controversial if durable engraftment of native donor-derived MSCs without ex vivo treatment can occur in the recipient of allogeneic HSCT. To assess the presence of donor-derived MSC following HSCT. Between July 2015 and July 2016, a total of 33 recipients of HSCT were analyzed for HSC and MSC chimerism. Eighteen patients received BM grafts (54%), 11 patients had peripheral blood as stem cell rescue (33%) and finally 3 patients had a cord blood transplantation (9%). Patients received myeloablative (91%) or reduced intensity conditioning (9%) for malignant (91%) or nonmalignant disease (9%). BM aspirate cells were plated and expanded in α-MEM with 10% Human Platelet Lysate at 10 000 cells/cm2. After 5–7 days, nonadherent cells were removed, while the adherent cells were expanded until they reached confluence. After 2 weeks we quantified MSC precursors as colony forming unit fibroblast (CFU-F). Finally the amplified sequences were resolved by capillary electrophoresis (3500 Ruo Genetic Analyzer, Applied Biosystems) and analyzed by comparing genotypes of BMT recipell detachment, nuclear DNA was extracted (Dneasy Blood and Tissue kit—Applied Biosystems) and specific polymorphic tandemly repeated regions (STRs) were amplified by means of the polymerase chain reaction(PCR) following the specific manufacturers' instructions. (AmpFℓSTR Identifile kit, Applied Biosystems following HSCT (HSC and MSC) to those of donors. We cultured 54 whole BM aspirates from patients following HSCT with a median time of 244 day (range: 41– 1606). CFU-F/1 × 106 growth was observed in a majority of BM samples (37 samples out of 54, 68.5%), enough MSCs to perform the chimerism analysis. All patients showed HSC engraftment while no patients had evidence of donor-derived mesenchymal cell engraftment even when BM aspirate was taken after several years from HSCT. This study shows that MSC after HSCT remain of recipient origin even when BM was analyzed years after HSCT. We do not observe differences after myeloablative or reduced intensity conditioning or regard to underlying disease. The role and the content of MSC in the HSCT graft remains to be established.

Disclosure of conflict of interest: None