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Development of a new third party unit for adult stem cell transplantation using clinical grade rejected cord blood units

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Cord blood unit (CBU) is a valuable alternative source of stem cells for patients without allogeneic stem cell donor. Few banked CBUs contain sufficient hematopoietic stem cells (HSC) to transplant adult patients. Different approaches have been used to increase the number of infused HSC, however most approaches have the disadvantage of increasing the cost of graft procurement or relying on a related haploidentical donor that may not be available. A new developed alternative approach consists of creating a third-party unit of enriched CD34⁺ cells from a pool of multiple HLA-blind cryopreserved CBUs. These pooled units were rejected by the public cord blood bank, due to small volume and/or low nucleated cell count. Seven recipients with hematological cancers received myeloablative conditioning followed by the co-infused of a $\geq 4/6$ HLA compatible CBU and a third-party composed of the pool CD34-selected cryopreserved CBUs. Six patients engrafted with a median neutrophil engraftment time of 19.5 (15-29) days. All engrafted patient showed a 100% HLA-matched CBU chimerism on day +14. All recipients had grade I-III acute graft-versus-host-disease (GVHD) that responded promptly to treatment and no patients developed chronic GVHD. Two patients died, one at day +28 of disease relapse and one at day +360 of multisystem organ failure. Not only this new method support the importance of increasing the number of HSCs to ensure rapid engraftment, but also demonstrate that clinical grade rejected CBUs can be used to create a third-party of enriched CD34⁺ cells to support a small $\geq 4/6$ HLA compatible CBU.

Biography

Linda Peltier is a registered nurse who recently completed a PhD in Experimental Medicine at McGill University. Practicing for more than 30 years in different health care fields, she became an authority in clinical and laboratory quality assurance. The past 10 years, she specialized in cord blood banking and stem cell processing. Working as Clinical Research Associate with Dr Pierre Laneuville at the McGill University Health Centre, she aspires to collaborate in the translation from bench to bedside of cellular therapies.

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