

Concise scientific report on mobilisation and harvest of haemopoietic stem cells

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al affiliation Mobilisation and harvest of haematopoietic stem cells In the current patient care, haematopoietic stem cell transplantation (HSCT) has been comprehensively exploited as a therapeutic and research modality. Disorders of the haematopoietic system and immune system use the haematopoietic stem cell transplant procedure. In metabolic disorders, the procedure is used for replacement of enzymes. Most medical centres prefer mobilising stem cells from the bone marrow than peripheral blood because of its advantages.

The gastrointestinal and central nervous system were damaged by irradiation as shown by studies in mid-20th century. Transplantation of genetically identical marrow or the animals own stored marrow prevented death. These was applied by Thomas and his colleagues in 1959 in treatment of leukaemia in humans. Survival was also permitted by grafts from histocompatible donors. In the early 1960s, allogeneic transplantation became feasible after the identification and typing of human leucocyte antigen (HLA). This work provided basis for the understanding hematopoietic stem cell transplantation.

Haematopoietic stem cells produce some daughter cells that retain stem cell properties. Primitive progenitors produce mature blood cells are continuously produced by less differentiated precursors which descend from the haematopoietic stem cells. In a lethally irradiated animal, a single stem cell can restore an entire lympho-hematopoietic system (Copelan, 2006). Since 2001, there has been an increase in the number of transplants occurring annually (Passweg, et al., 2014).

However, when the histocompatibility antigens of the donor and the recipient

are incompatible, there could be strong transplant reactions and the intensity increases with the multiple peptides generation from the degraded HLA molecules and in the presence of determinants on the HLA molecules that are recognisable on the cell surface of the cells presenting the antigen. When an immune response is stimulated, an injury referred to as graft-versus host disease (GVHD) occurs due to the preparative regimen used before transplantation causing injury (Copelan, 2006).

Haematopoietic stem cell transplant is usually successful if there is a positive outcome. Many diseases are treated with either autologous or allogeneic haematopoietic stem cell transplantation. The type and stage of the disease, the age and functional level of the patient, the source of the stem cell to be transplanted and the degree of mismatch of HLA affect the outcome (Dainiak & Ricks, 2014). The autologous transplantation improves survival rather than cure multiple myeloma. HSCT has resulted in sustained diminution in patients with autoimmune disease. The transplantation cures many genetic diseases such as combined immunodeficiency, sickle-cell anaemia, the Wiskott-Aldrich syndrome and thalassemia. According to (Veljkovic, et al., 2011) collection of peripheral blood stem cells is an effective and safe procedure even when conducted in young children.

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