Stem cell transplantation and Cancer Treatment: Our experience from a Super-specialty Oncology Hospital

Siddhartha Roy, E. Venkataswamy and Vidya Harini Veldore

Triesta Reference Laboratory, HealthCare Global Enterprises, Bangalore - 560027

Stem cell transplantation remains the most favored modality in cases of refractory disease in cancer. Chemotherapy and/or radiation therapy at higher doses have a debilitating effect on the regenerative capacity of bone marrow, so Bone Marrow Transplantation and Peripheral Blood Stem Cell Transplantation help in restoring the stem cells. There are three prevalent modes of transplantation: Autologous (Patient's own stem cells isolated and replaced back), Allogeneic (Compatible donor's stem cells isolated and introduced in the recipient) and Syngeneic (Transplantation among Twins). The motive behind transplanting healthy Stem Cells back into the patient after high doses of chemo and radiotherapies is to rejuvenate bone marrow to regenerate. The whole process takes real-time, round-the-clock monitoring, and decision making on part of the whole team, through number of days. The stem cells are isolated, accumulated, frozen and then transfused after thawing. Molecular biology techniques like HLA typing, CD34 enumeration by immunophenotyping etc has to be employed for the completion of a successful transplantation procedure. The emergence of Cancer Stem Cells (CSCs) pose a threat as they have properties similar to the native stem cells, so differentiating hematopoietic stem cells from the leukemic stem cells by biomarker characterization is crucial. One approach involves targeting the cancer stem cells by incorporating the fact that hematopoietic stem cells express *Thy-1* and *c-kit* whereas leukemic stem cells express *IL-3* (interleukin-3) receptor á-chain. We would be presenting the salient features of the three approaches, their advantages and limitations and would share our experience from a cancer super-specialty centre.