

Pre-transplant Conditioning Regimens in Allogeneic Transplantation for Leukemia: Current Practices and Advances

Faustina Mazaya*

Department of Health of Special Capital Region of Jakarta, Jakarta University, Indonesia

Abstract

Pre-transplant conditioning regimens are pivotal in allogeneic hematopoietic stem cell transplantation (allo-HSCT) for leukemia, aiming to eradicate malignant cells, suppress the recipient's immune system, and facilitate donor cell engraftment. This article explores current practices and recent advances in pre-transplant conditioning regimens, encompassing chemotherapy, total body irradiation (TBI), reduced-intensity conditioning (RIC), targeted therapies, and immunomodulatory approaches. Key considerations include regimen selection based on disease status and patient characteristics, optimization of treatment efficacy while minimizing toxicity, and innovations in pharmacogenomics and personalized medicine. Challenges in graft-versus-host disease (GVHD) management and long-term outcomes are also discussed, highlighting the evolving landscape of allo-HSCT for leukemia.

TBI is another component of conditioning regimens, particularly in myeloablative settings. It delivers ionizing radiation to the entire body to eradicate malignant cells and suppress the recipient's immune system, facilitating donor cell engraftment [3].

Reduced-intensity conditioning (RIC)

RIC regimens use lower doses of chemotherapy and/or TBI compared to myeloablative regimens. RIC aims to reduce treatment-related toxicity while still allowing donor cell engraftment. This approach is often preferred for older adults and patients with comorbidities who may not tolerate high-dose therapy.

depletion of T-cells from the graft or use of post-transplant immunosuppressive agents, are being explored to improve the safety and tolerability of conditioning regimens.

Considerations and future directions

Optimizing regimen selection

Choosing the appropriate conditioning regimen remains a critical decision in allo-HSCT, balancing the need for disease control with minimizing treatment-related toxicity and complications.

Long-term monitoring and studies are essential to evaluate the