

Hematopoietic stem cell transplantation (HSCT): An approach to autoimmunity

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Abstract

HSCT provides the opportunity to replace a damaged tissue. It is the most important treatment for high risk hematologic malignant and non malignant disorders. An important challenge in the identification of matched donors/patients is the HLA diversity. The Mexican Bone Marrow Registry (DONORMO) has nowadays >5000 donors. The prevalent alleles are Amerindian, Mediterranean (Semitic and Spanish genes) and African. In theory, it is possible to find 11% of 6/6 A–B–DR low resolution matches for 70% of patients with Mexican ancestry. We contributed with 39 unrelated, cord blood and autologous HSCT for patients with malignant, genetic and autoimmune disorders. Overall disease survival was 50% (2–7 years) depending on the initial diagnosis, conditioning, disease evolution or other factors. Clinical studies using autologous and unrelated HSC are performed on patients with refractory autoimmune diseases producing mixed results: mainly, T1D, RA, MS, SLE. Improvement has been observed in skin damage and quality of life in SLE and systemic sclerosis. Disease stabilization in 2/3 of MS patients. However, in RA and T1D, initial benefits have been followed by eventual relapse. With growing clinical experience and protocol improvement, treatment-related mortality is decreasing. Proof efficacy will be achieved by comparing HSCT with standard therapy in autoimmunity.

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Contents

1. Introduction	168
1.1. Overview	168
2. Major histocompatibility antigens	168
2.1. Genes encoding the HLA loci involved in transplantation	169
2.2. HLA matching	169
2.3. Other genetic systems involved in HSCT	169
2.3.1. Minor Histocompatibility Antigens (mHA)	169
2.3.2. Natural Killer cells (NK)	169
3. Outcomes influences by genetic disparity between the donor and recipient.	170
3.1. Difference in response against major and minor antigens	170
3.2. Engraftment, Graft vs. Host Disease (GVHD) and Graft vs. Leukemia (GVL)	170
3.2.1. Engraftment	170
3.2.2. GVHD.	170
3.2.3. GVL.	171
4. HSCT from unrelated donors	171
4.1. The HLA barrier	171
4.2. Development of donor registries and selection of donors	172
4.3. The Mexican Bone Marrow Donors Registry DONORMO and Unrelated Mexican Cord Blood Bank BACECU activity	172
5. HSCT for Autoimmune Diseases (AD)	173
5.1. Historical perspective.	173
5.2. Animal models	173
5.3. Treatment of human autoimmune disease with HSCT	174
5.4. Multiple Sclerosis (MS).	174
5.5. Rheumatoid Arthritis (RA).	175
5.6. Systematic Lupus Erthematosus (SLE).	176
5.7. HSCT in other AD	176
5.8. Immune reconstitution and gene marking	176
6. Conclusions	177
Acknowledgement	177
Take-home messages	177
References	178

1. Introduction

1.1. Overview

Immunology plays a central role in allogeneic HSCT. This treatment was developed as a strategy to prevent the bone-marrow toxicity that is caused by intense chemotherapy regimens and it cures a significant percentage of patients who have otherwise fatal hematologic malignancies. Reciprocal immune reactions between donor and recipient are a major feature of allogeneic HSCT and have both, deleterious (GVHD—graft versus host disease) and beneficial consequences (GVL—graft versus leukemia

effect). Other immunological mechanisms involved in engraftment, control of malignancy, the development of tolerance and immune reconstitution requires understanding of the immunogenetic basis for immune reactions provoked by grafting tissue from one individual to another [1].

2. Major histocompatibility antigens

The Major Histocompatibility Complex (MHC) is the most important genetic region in the human genome in relation to infection, autoimmunity and transplantation. The HLA complex (Human Leukocyte Antigens)

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