

SNPs - New Information for Matching Patients and Donors for Transplants

Important Points:

- Many complications of HLA-mismatched transplantation are the result of genes that are not currently tested in the pre-transplant evaluation process of donors and patients.
- Scientists use SNPs, which are very small changes in the DNA genetic code, to locate unknown genes.
- Some SNPs are associated with better results after transplantation than other SNPs.

For hematopoietic cell transplantation to work, the donor's cells must match the patient's cells' tissue types, also known as HLA. If the patient and donor have the same HLA tissue types, then it is called an HLA-matched transplant. If several of their tissue types are different, it is called an HLA-mismatched transplant.

Doctors prefer to do HLA-matched transplants, not HLA-mismatched transplants, but sometimes they can't find a matching donor. In the US, white patients have a 75% chance of finding an HLA-matched donor, and African American patients have a 31% chance. If doctors use HLA-mismatched transplants, then 94% of white patients and 69% of African American patients could find donors.

This study looked at how to make HLA-mismatched transplants safer and better. Researchers found that very small changes in a person's DNA genetic code are important. These small changes are called single nucleotide polymorphisms (SNPs). SNPs provide clues to new genes that affect how well a patient does after an HLA-mismatched transplant.

The researchers looked at 2,628 patients and their HLA-mismatched donors. For each patient-donor pair, the researchers studied 1,108 SNPs. They found 12 specific SNPs that affect how well patients do after an HLA-mismatched transplant.

SNP problems can come in 3 different ways:

1. From the donor,
2. From the patient, or
3. From the SNPs of the donor and the patient not matching.

Patients do worse after an HLA-mismatched transplant if they have more problem-SNPs. Some problem-SNPs are associated with relapse, meaning the patient's cancer returns. Other problem-SNPs are associated with graft versus host disease, which is a serious side-effect of transplant.

SNPs help researchers find the genes that cause serious side effects after transplantation. In the future, patients might do better after transplant if doctors can match donor and patient SNPs and, eventually, the newfound genes.

This study shows that SNPs give new information on the potential success of an HLA-mismatched transplantation.

Source:

Mapping MHC haplotype effects in unrelated donor hematopoietic cell transplantation. Petersdorf EW, Malkki M, Horowitz MM, Spellman SR, Haagenson MD, Wang T. Blood. 2013 Mar 07;121(10):1896-1905. Epub 2013 Jan 10.