aGvHD

ASH 2018 | The role of metabolomics profiling in acute graft-versus-host disease

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The 60th American Society of Hematology (ASH) Annual Meeting was held in San Diego, California, from 1–4 December 2018. On Saturday 1 December 2018, an oral abstract session was held entitled: *722. Clinical Allogeneic Transplantation: Acute and Chronic GvHD, Immune Reconstitution: GvHD Grading and Outcomes and Management*. During this session, Abstract #69 was presented, entitled: *Metabolomics Profiling after Allogeneic Hematopoietic Stem Cell Transplantation Unravels a Specific Signature in Human Acute GvHD* by David Michonneau from Hôpital Saint-Louis AP-HP, Paris, France.

Many previous researches were assessing acute graft-versus-host disease (GvHD) pathophysiology but only a few of them focused on human GvHD. Recent studies have shown the role of tissue microenvironment or host microbiota regarding allo-immune responses. The focus of this study was to find metabolomics alterations associated with allogeneic transplantation and to define a pathway.

The main objectives of the study were the following two questions:

- How does the transplantation process affect patients' metabolomics profile?
- What metabolomics pathways are involved at acute GvHD onset in humans?

Patients and methods

- Donors and recipients' frozen plasma samples were collected from patients who received bone marrow transplantation from a HLA-identical sibling donor
- Patients were included from a monocentric cohort (Cohort 1; donors: n = 43; recipients: n = 44), and a multicentric cohort (Cohort 2; donors: n = 56; recipients: n = 56)
- Samples from donors were collected before stem cell collection
- Plasma samples were examined by two separate reverse phase (RP)/UPLC-MS/MS methods with positive ion mode electrospray ionization (ESI)
    - Analysis by RP/UPLC-MS/MS with negative ion mode ESI
    - Analysis by HILIC/UPLC-MS/MS with negative ion mode ESI

Key findings

- Patients who developed acute GvHD
    - Cohort 1: n = 12

    - Cohort 2: n = 26
- Metabolomics pathways involved in acute GvHD
    - Increased at GvHD onset: primary bile acid, secondary bile acid, polyunsaturated fatty acid
    - Decreased at GvHD onset: tryptophan, arginine, proline, urea metabolisms, plasmalogens

This study shows that allogeneic transplantation causes major metabolomics changes in recipients, which may associate with drug intakes, metabolic stress or microbiota alteration. Complex lipid metabolism and amino acid metabolites play an important role in GvHD development. Dr. Michonneau added that "this study highlights the potential role of circulating metabolites in GvHD pathophysiology that could be targeted for prophylaxis or treatment."

Reference

1. Michonneau D.*et al.* Metabolomics profiling after allogeneic hematopoietic stem cell transplantation unravels a specific signature in human acute GvHD. Abstract #69. ASH 60th Annual Meeting and Exposition, San Diego, CA.