Predicting acute graft-versus-host-disease in allogeneic stem cell transplantation patients

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Abstract

Allogeneic hematopoietic stem cell transplantation (allo-HSCT) is the transplantation of donor derived stem cells and treats a variety of hematologic and non-hematologic disorders. Allo-HSCT patients exhibit changes in their gut microbiota and experience a range of complications post-treatment, including acute graft-versus-host disease (aGvHD). The potential roles or timing of gut microbiota reestablishment and immunological homeostasis after allo-HSCT are not known. It is also not yet known if the microbiota at other body sites plays a role. Recently, researchers ran an integrated host-microbiota analysis of the gut, oral, and nasal microbiota in children undergoing allo-HSCT. The bacterial diversity decreased in all three sites during the first month. Certain microbial taxa were already different in allo-HSCT patients before transplantation compared to healthy children. Onset of acute GvHD after treatment could be predicted from the pre-treatment microbiota composition at all three body sites. The reconstitution of CD4+ T cells, Th17, and B cells was associated with distinct bacterial families in the gut microbiota, oral microbiota, and nasal microbiota. This study is the first to suggest that bacteria in the mouth and nose may be useful to predict acute GvHD and may provide opportunities to develop personalized preventive clinical management.