Specific Microorganism Strains for Achieving Specific Health Targets in Children Undergoing Hematopoietic Stem Cell Transplant

Rossella Paolillo,1 Maria Vasco,1 Claudio Napoli1,2

Dear Editor,

We read with interest the article, “Pretransplant nutritional habits and clinical outcome in children undergoing hematopoietic stem cell transplant” by Tavil and associates.1 This study investigated the effects of pretransplant energy and nutrient contents, nutritional habit (probiotic and prebiotic intake), and the nutritional status on clinical outcomes and deleted complications of hematopoietic stem cell transplant that may affect the transplant.

High-dose chemotherapy and radiation therapy may be required before a transplant can cause frequent and severe gastrointestinal adverse effects, leading to poor oral intake and requiring assistance to maintain adequate nutrition. Ensuring adequate nutrition is important, and a nutritional replacement is necessary.2

Bloodstream infections, mainly during pre-engraftment neutropenia, represent a significant cause of morbidity in patients undergoing a hematopoietic stem cell transplant.3 Risk factors are associated with this complication, but presence of granulocytopenia, central venous catheters, and acute graft-versus-host disease (aGVHD) represent the leading predisposing conditions.4

Bacterial lipopolysaccharide is significant in developing aGVHD.5 Some authors report that the proinflammatory potency of bacterial lipopolysaccharide varies from bacterial species to species.6

The gastrointestinal tract holds a collection of microorganisms that form an individual microbiota that this typical for each person.7 Chronic inflammatory bowel disease appears to be the result of a genetically determined unbalanced immune response to ubiquitous luminal bacterial antigens.8

Probiotic microorganisms recently have received much attention owing to reports of beneficial effects in treating various chronic intestinal inflammatory conditions.9 The definition of probiotics has evolved from a live active culture that improves the balance of the gut microbiota composition to specific effects; particularly, the immunomodulatory potential of clearly defined strains.10 Bacteria strains with beneficial properties, potential sources of probiotics, frequently belong to the such genera Bifidobacterium and Lactobacillus, some of which exhibit powerful anti-inflammatory properties.7 Indeed, probiotic therapy has attracted research interest in human infectious, inflammatory, and allergic diseases. Current interest in nutrition is directed toward developing dietary compounds, such as probiotic bacteria.11

We agree with authors who write that we should evaluate the nutrient contents and nutritional habits of patients, because they may influence transplant outcomes. However, precise information regarding the strain used in the yogurt is needed to estimate the negative correlation that these authors claim.

The joint FAO/WHO Expert Communication recommended that strains be named according to the International Code of Nomenclature.12 Indeed, the biology of a probiotic strain cannot be extrapolated to another strain, even within the same species.13 The properties of a specific strain may be of significant importance when studying the biological and clinical effects of probiotic bacteria.

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Corresponding author: Rossella Paolillo, D. Biol., PhD, U.O.C. Immunohematology, Transfusion Medicine and Transplant Immunology (SIMT), Regional Reference Laboratory of Transplant Immunology (LIT), Azienda Universitaria Policlinico (AOU), Second University of Naples; and the Department of General Pathology, Chair of Clinical Pathology, and Excellence Research Centre on Cardiovascular Diseases, Azienda Universitaria Policlinico (AOU), Second University of Naples, Piazza Miraglia 2, 80138 Naples, Italy

Address for correspondence: Rossella Paolillo, U.O.C. Immunohematology, Transfusion Medicine and Transplant Immunology (SIMT), Regional Reference Laboratory of Transplant Immunology (LIT), Azienda Universitaria Policlinico (AOU), Second University of Naples, Piazza Miraglia 2, 80138 Naples, Italy

Phone: +39 081 566 5065 Fax: +39 081 970 0941 E-mail: rossella.paolillo@policliniconapoli.it

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Furthermore, there is increasing evidence that probiotic therapy can effectively treat inflammatory bowel disease.\(^6\) To address the effect that modulation of the bowel flora has on aGVHD, some authors have used a well-described murine transplant model in which aGVHD is induced across a haploidentical major histocompatibility complex mismatch. The model is characterized by severe damage of the bowel mucosa, high-serum bacterial lipopolysaccharide levels after transplant, and strong release of proinflammatory cytokines.\(^{14,15}\) Gerbitz and associates\(^6\) showed that oral administration of Lactobacillus rhamnosus GG, before and after a transplant, results in improved survival and a reduced incidence of aGVHD.

Also, probiotics intended to control H. pylori have attracted attention. Lactobacillus gasseri OLL2716 has proved effective in suppressing H. pylori colonization of the stomach and reducing gastric mucosal inflammation, and it has been reported that an L. gasseri OLL2716 strain contained in a yogurt drink may colonize the gastric mucosal layer in infected patients. But the mechanisms by which these bacteria mediate their effects remain unclear.\(^6\)

Therefore, the use of probiotics should be considered relevant if selecting microorganism strains to achieve specific health targets. This may reveal the full effect of its therapeutic potential. Further studies are necessary to explore and confirm any beneficial effects of probiotics in hematopoietic stem cell transplants.

References