

The Role of Oral Microbiota Dysbiosis in Adolescents Acquiring Acute Lymphoid Leukemia Therapy

Goel Harsh *

Department of Laboratory Oncology, All India Institute of Medical Sciences, New Delhi, India

DESCRIPTION

Children between the ages of two and fifteen are the primary victims of Acute Lymphoblastic Leukemia (ALL), a hematological neoplasm that is typified by an increased proliferation of blasts in the bone marrow. The severe immunosuppression brought on by chemotherapy treatment typically results in detrimental oral manifestations in patients with hematological and/or oncological diseases. It is evident from the detrimental effects of pathogenic bacterial growth on the oral mucosa and the corresponding immune system that a healthy microbiome not only acts as a natural barrier and source of nutrition, but also affects how well medical treatments work. In order to support both oral and general health during treatment, the oral environment can be helped, particularly in individuals who are compromised, such as those who have hematological malignancies. An ecological balance exists in health between the microorganisms that colonize mucosal surfaces and the human host. Chemotherapy is recommended for pediatric patients as a part of their treatment because it changes the microbiota in the area. These treatment's cytotoxic effects increase immunosuppression, which can lead to complications like infections and fibrillation. These changes in the environment can also upset the ecological balance of the microbiota in the gastrointestinal tract and mouth. The oral microbiota serves as a storehouse for microorganisms in the planktonic stage that will eventually colonize and recolonize the various oral cavity habitats. However, according to by the clinical outcomes and blood profile of the study participants, it can become opportunistic and pathogenic in immunocompromised patients, leading to infections. This imbalance can then cause leukemic manifestations such as pallor of the oral mucosa, gum discoloration, gingival petechiae, and ulcerative lesions in the mucosa. According to previous studies, the genus *Actinomyces rose* in number among the top five during the pre-induction phase.

During the consolidation phase, *Alloprevotella* experienced the same phenomenon. *Actinomyces* may play a part in the consolidation phase of the bacterial community and form a complex diversity composition that may arise from potential changes in the host defenses that would restrict the community's composition to pathogenic commensals. On the other hand, when a disease advances, the commensal bacterial community's diversity decreases, making the patient more vulnerable to opportunistic infections and lowering their quality of life. Recently, a number of cases involving *Actinomyces* infections in patients following hematopoietic stem cell transplantation have been documented. *Actinomyces* oral infections are uncommon in immunocompetent people but end up being more common in immunocompromised people. The opportunistic frame, with unusual and erratic presentations, it has significant morbidity. If not identified in a timely manner, the condition may worsen and possibly result in death. The possibility that other kinds of microorganisms thought to be non-pathobionts may be influencing the development of carcinogenesis is another area of research that has been the subject of some studies. *Neisseria flavescens*, one of these "healthy-associated species," and *Haemophilus parainfluenzae* have both been shown to cause cytotoxicity through intracellular infection. As a result, these three microbes may someday be the focus of risk stratification in the emergence of secondary neoplasms. This study has certain limitations. The cohort is too small and unrepresentative. Nonetheless, it serves as Brazil's largest pediatric hospital, making it a fascinating clinical cohort. Furthermore, the COVID19 pandemic severely restricted the sampling and enrollment of additional patients, both ill and well, in the study. Not withstanding these constraints, the outcomes concerning the oral microbiota were robust and consistent, enhancing our comprehension of the alterations in oral bacteria throughout the various stages of the antitumor treatment.

Correspondence to: Goel Harsh, Department of Laboratory Oncology, All India Institute of Medical Sciences, New Delhi, India, E-mail: harsh@gmail.com

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