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Editorial

Cancer in Primary Immunodeficiency Diseases: An Overlooked Threat

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In fear of a cancer diagnosis, persons with PIDs face an added risk. PIDs are genetic disorders that confer immune system defects on affected individuals, rendering them more vulnerable to infection and some malignancies (1). Over the years, medical advancements have transformed survival rates; however, this has also uncovered an unsettling trend of cancer incidence widening in these. The relationship between PIDs and cancer is quite complex, and its understanding is imperative for improving the outcomes of patients. For many with PIDs, the immune system fails in its most basic function, the surveillance part, which allows those abnormal cells to proliferate unchecked (2). Hematologic malignancies, mainly non-Hodgkin lymphomas and leukemias, represent the most commonly observed cancers (3). Chronic viral infections sustained by the Epstein-Barr virus are also thought to promote the growth of tumors, especially under such conditions as in Wiskott-Aldrich syndrome (4). The genetic defects underlying PIDs also have a direct causative link to oncogenesis, as in the case of ataxia-telangiectasia, where deficiencies in DNA repair systems lead to an increased cancer susceptibility (5). The problem of malignant disease in PID patients is far beyond a simple one of biological risk. The threshold to diagnosis is frequently fraught with delay because of overlapping symptoms between cancer and its comparatives within the complication of an immunodeficiency (6). Late diagnosis—which makes successful treatment significantly less probable—often confronts clinicians. While the early signs of cancer in the general public might suggest investigation, for patients with PIDs, symptoms of cancer may frequently be viewed as consequences of their immunocompromised state, like fatigue, unexplained weight loss, or defined fever, and not as indicators of malignancy (7). By the time cancer is diagnosed, it's often in a much-advanced stage, which complicates treatment options and prognoses. Once diagnosed, then the treatment presents yet another hurdle. Most conventional cancer therapies, including chemotherapy and radiation, can be hyperconscious to their counterparts with primary immunodeficiency.

Treating the patient with the diagnosis is, in itself, an administrative and logistical hurdle. All traditional cancer treatments, chemotherapy, and radiation among them may be too aggressive for the immune-compromised, leaving them vulner-

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able to life-threatening infections (8). A multidisciplinary approach that weighs the value of effective cancer treatment against the risk of the harm undergone becomes essential. Immunologists, oncologists, and infectious disease specialists should work together to tailor therapy, some of which will include targeted immunotherapy and hematopoietic stem cell transplantation (9). The development of newer modalities of treatment, including checkpoint inhibitors, gene therapy, etc., can change the situation for the better in this sensitive population (10).

These challenges nevertheless assure that an end could be reached before long. Regular cancer screening for specific PIDs could greatly enhance early detection (11). Genetic counseling and monitoring of high-risk individuals can help. Teaching patients and caretakers, warning signs may encourage timely medical evaluation, which can be lifesaving (12). Also, research and patient registries should be funded and useful to the medical community to fine-tune strategies for surveillance and treatment in improving long-term outcomes for individuals with PIDs (13).

Among the currently under-acknowledged yet pressing problems is the issue of cancer in primary immunodeficiency. Greater awareness on the part of healthcare providers and patients, research advancements, and multidisciplinary cooperation among specialists will be necessary to overcome the newly arising challenges in these diseases. Proactive efforts will enable us to advance the prognosis and quality of life of these patients who struggle against the odds to withstand cancer, providing the desired care and support.

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