

Immunotherapy in Pediatric Oncology

An overview of therapy types and nursing implications

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BACKGROUND: By using the body's own protective system to fight cancer, immunotherapy is not only effective but also is associated with fewer side effects than chemotherapy.

OBJECTIVES: This article provides an overview of four types of immunotherapy (monoclonal antibodies, chimeric antigen receptors, immune checkpoint inhibitors, and cancer vaccines) and discusses the critical role assumed by nurses in the care of patients receiving immunotherapy.

METHODS: A review of the literature was undertaken to identify, describe, and compare the types of immunotherapy used and studied for use in pediatric oncology.

FINDINGS: Nurses caring for pediatric patients with cancer may have little experience with immunotherapy. However, they should become knowledgeable about it, particularly as it becomes further integrated into pediatric cancer treatments.

KEYWORDS

neoplasm; pediatric nursing; molecular targeted therapy; immunotherapy

DIGITAL OBJECT IDENTIFIER

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ONE OF THE EARLIEST DOCUMENTED USES OF IMMUNOTHERAPY was in 1891, after American cancer surgeon and researcher William B. Coley observed disease regression in a young man with sarcoma following a strep infection (Ginex, Brassil, & Ely, 2017). Coley then devoted the rest of his career to the study of immunotherapy, specifically whether intentionally infecting the body with bacteria could stimulate the immune system to treat cancer (Ginex et al., 2017). Much of today's research on immunotherapy is devoted to its use in adults. However, interest in immunotherapy in pediatric patients has grown exponentially, particularly when it is used as an adjuvant therapy with standard cancer treatments (Shah & Goldberg, 2015). Immunotherapy was listed as one of the seven next great achievements in pediatric research (Cheng, Bogue, & Dover, 2017). In addition, the U.S. Food and Drug Administration (FDA) has approved a number of immunotherapy drugs for pediatric use (Shah & Goldberg, 2015).

Cancer immunotherapy can be defined as several treatment strategies that aim to optimize the immune system to fight disease while minimizing autoimmune toxicity (Shah & Goldberg, 2015). Unlike chemotherapy, immunotherapy targets specific cells and spares healthy cells, resulting in substantially fewer side effects. Immunotherapy offers a promising approach for many pediatric malignancies, particularly those no longer responsive to standard cytotoxic therapies (Wayne, Capitini, & Mackall, 2010). This article offers an overview of four immunotherapies in use or being studied for use among pediatric patients with cancer (i.e., monoclonal antibodies [MABs], chimeric antigen receptors, immune checkpoint inhibitors, and cancer vaccines), as well as discusses the significant role nurses play when caring for pediatric patients with cancer undergoing immunotherapy.

Monoclonal Antibodies

MABs are manufactured proteins that have the capability to act as endogenous antibodies and target a specific antigen on a tumor cell (Bayer et al., 2017). MABs can be derived from various types of cells, including murine