Hematologic B-cell malignancies, which have varying behavior patterns, disease processes, and treatment responses, include non-Hodgkin lymphoma, leukemias, and myeloma. Although monoclonal antibodies and other agents have led to dramatic advances in the treatment of B-cell malignancies, the development of small molecules have enhanced the ability to treat and manage these malignancies and their adverse events (AEs). Oncology nurses need to be educated on the unique side effects for each class of these agents so that they can administer interventions to prevent and manage AEs in patients.

AT A GLANCE

- Bruton's tyrosine kinase (BTK), phosphoinositide 3-kinase (PI3K), and B-cell lymphoma 2 (BCL2) inhibitors are a significant component of the treatment and management of B-cell malignancies.
- BTK, PI3K, and BCL2 inhibitors have unique AEs associated with off-target effects, which can be prevented or controlled to allow patients to continue receiving these agents.
- Oncology nurses can educate patients on the potential for and assessment and management of AEs associated with the use of these agents in the treatment of B-cell malignancies.

KEYWORDS
B-cell malignancies; adverse events; small molecule agents; hematologic malignancies

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B-Cell Malignancies

The use of small molecule agents for treatment and management

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Clonal growth of B cells, T cells, and natural killer cells can cause malignant tumors to develop in lymphoid tissues (Crisci et al., 2019). Hematologic B-cell malignancies, such as non-Hodgkin lymphoma (NHL), leukemia, and myeloma, have varying behavior patterns and treatment responses and may arise during any stage of normal B-cell development. These diseases are divided based on the varying stages of maturation of the cells from which they derive. The World Health Organization (WHO) does not categorize B-cell lymphomas based on their aggressiveness; instead, these cancers are categorized based on their morphology, immunophenotype, and genetic findings (Swerdlow et al., 2016). Many indolent or slow-growing B-cell lymphomas, which represent about 35%–40% of NHLs and include follicular lymphoma (FL), chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL), a proportion of mantle cell lymphoma (MCL), marginal zone lymphoma (MZL) and lymphoplasmacytic lymphoma, have a prognosis of years. The prognosis for patients with untreated aggressive NHL can be only months, but remission or cure may be possible in some patients with treatment. Diffuse large B-cell lymphoma is the most common form of aggressive lymphoma (Crisci et al., 2019).

Chemotherapy and radiation therapy have often been used, either alone or in combination, to treat B-cell malignancies. Increased understanding of the intracellular processes that are deregulated during the development of B-cell malignancies has led to the development of new targeted therapies. Although monoclonal antibodies and other agents have led to dramatic advances in treatment, the development of small molecules has also enhanced the ability to treat and manage B-cell malignancies (Ayyappan & Maddocks, 2019).

Novel Small Molecules

Novel small molecules, including Bruton's tyrosine kinase (BTK), phosphoinositide 3-kinase (PI3K), and B-cell lymphoma 2 (BCL2) inhibitors, are a heterogeneous group of agents with varying mechanisms of action that have been approved for the treatment and management of FL, CLL/SLL, MCL, MZL, Waldenström macroglobulinemia, and diffuse large B-cell lymphoma. All of these inhibitors can have drug–drug interactions with other agents that are metabolized by the cytochrome P450 3A enzymes and other enzyme pathways (National Comprehensive Cancer Network [NCCN], 2019, 2020a, 2020b).

Bruton's Tyrosine Kinase Inhibitors

BTK inhibitors are a key component of B-cell receptor signaling pathways and are involved in the proliferation, maturation, differentiation, apoptosis, and migration of B cells (Kim, 2019). BTK inhibitors also play a role in the progression of lymphoproliferative disorders of B cells, which make them an important target for treating and managing B-cell malignancies