Colleen Lewis, MSN, ANP-BC, AOCNP®

Background: Programmed death-1 (PD-1) immune checkpoint inhibitors are novel immuno-oncology agents. Unlike chemotherapy or targeted agents, which inhibit tumor cell proliferation or induce tumor cell death, immune checkpoint inhibitors are designed to stimulate a patient’s own immune system to eliminate tumors. As a result of their mechanism of action, PD-1 pathway inhibitors are associated with adverse events (AEs) with immunologic etiologies, termed immune-mediated AEs (imAEs). These include skin and gastrointestinal AEs, and endocrine, hepatic, renal, and respiratory AEs, including pneumonitis. Most imAEs can be effectively managed with treatment interruption/discontinuation and/or steroids or other immunosuppressive agents. A specialist consult may be required in some cases, and endocrine imAEs may require permanent hormone replacement therapy.

Objectives: This article provides an overview of PD-1 inhibitors, including the potential mechanism of action, key clinical trial data, and strategies for managing patients who may receive PD-1 inhibitors for the treatment of non-small cell lung cancer.

Methods: Information in the article comes from PubMed literature searches and the author’s experience with these agents in clinical trials.

Findings: Oncology clinicians must thoroughly assess baseline functioning and symptoms and be vigilant for imAEs, which require prompt diagnosis and management. A good understanding of the clinical profile of PD-1 pathway inhibitors is instrumental in helping clinicians manage patients receiving these new therapies.

Colleen Lewis, MSN, ANP-BC, AOCNP®, is a nurse practitioner for the Phase I Clinical Trial Program at the Emory University Winship Cancer Institute in Atlanta, GA. The author takes full responsibility for the content of the article. Writing and editorial support was provided by Britt Anderson, PhD, and Lisa Sullivan, MA, CMPP, at StemScientific, an Ashfield company, through support from Bristol-Myers Squibb. Lewis received personal fees from Array BioPharma, outside of the submitted work. The content of this article has been reviewed by independent peer reviewers to ensure that it is balanced, objective, and free from commercial bias. No financial relationships relevant to the content of this article have been disclosed by the independent peer reviewers or editorial staff. Mention of specific products and opinions related to those products do not indicate or imply endorsement by the Clinical Journal of Oncology Nursing or the Oncology Nursing Society. Lewis can be reached at colleen.lewis@emoryhealthcare.org, with copy to editor at CJONEditor@ons.org. (Submitted April 2015. Revision submitted August 2015. Accepted for publication August 23, 2015.)

Key words: immune checkpoint blockade; PD-1; immuno-oncology; nivolumab; pembrolizumab

Digital Object Identifier: 10.1188/16.CJON.319-326

The immune system has the ability to recognize and eliminate tumors, as evidenced by greater cancer incidence in patients with reduced immune function (Grulich, van Leeuwen, Falster, & Vajdic, 2007). Tumors can evade an effective anti-tumor immune response by creating an immunosuppressive microenvironment (Jadus et al., 2012). One key mechanism that tumors use to evade immune responses occurs via effects on immune checkpoint pathways (Nirschl & Drake, 2013). Programmed death-1 (PD-1) and cytotoxic T-lymphocyte-associated protein 4 (CTLA-4) are immune checkpoint receptors expressed by activated T cells. When PD-1 or CTLA-4 binds one of its ligands, T-cell proliferation and activation is prevented, suppressing T-cell function. Human tumors can express the