■ Article

Programmed Death-1 Inhibition in Cancer With a Focus on Non-Small Cell Lung Cancer: Rationale, Nursing Implications, and Patient Management Strategies

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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.

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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