■ Article

Targeted Therapies for Non-Small Cell Lung Cancer: An Update on Epidermal Growth Factor Receptor and Anaplastic Lymphoma Kinase Inhibitors

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Background: The development of targeted therapies has revolutionized the treatment of advanced non-small cell lung cancer (NSCLC), with new clinical trials and therapies consistently providing new information. This rapidly changing field mandates ongoing education for nursing professionals whose foremost priority is patient care.

Objectives: This review aims to summarize the history and current status of targeted therapies for NSCLC, focusing on two types of drugs that have had the most impact to date: epidermal growth factor receptor (EGFR) and anaplastic lymphoma kinase (ALK) inhibitors.

Methods: The safety profiles of first- and second-generation EGFR and ALK inhibitors are described, and strategies for the management of the most commonly experienced adverse events are summarized. Information is also provided to help identify which patients might be eligible for treatment with EGFR or ALK inhibitors in addition to the implications of targeted therapies.

Findings: Therapies designed to target specific molecular features of individual tumor cells are one of the most important developments in treating NSCLC. The safety profiles of targeted therapies differ greatly from chemotherapy and present unique challenges to nurses. Education of nurses and patients on implementation of effective adverse event management and improvement in patient adherence will maximize the benefits of these drugs.

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Lung cancer is the most commonly diagnosed cancer worldwide (Ferlay et al., 2010). Non-small cell lung cancer (NSCLC) is its most prevalent form, comprising 85%–90% of newly diagnosed cases in the United States (American Cancer Society [ACS], 2015b). Most patients with NSCLC have a poor prognosis, partially because more than half are diagnosed when the disease is already advanced (Surveillance, Epidemiology, and End Results Program [SEER], 2015). Five-year survival rates for patients diagnosed with stages IIIB and IV lung cancer without regard to molecular subtype are as low as 5% and 1%, respectively (ACS, 2015a). The use of targeted therapies has the potential to increase the survival rate for patients harboring specific mutations.

Because nurses play an essential role in the assessment and management of patients with NSCLC (Walker, 2008), they and other healthcare professionals must remain up to date with developments in the treatment of this challenging and often devastating disease. Epidermal growth factor receptor (EGFR) was identified as a potential anticancer target in the late 1980s (Mendelsohn, 1988; Mok, Lee, & Leung, 2014), but many advances have been made since then. Gefitinib (Iressa®) was approved for use in NSCLC in 2003 (AstraZeneca, 2015), and erlotinib (Tarceva®) was approved in 2004 (Astellas Pharma US, Inc., & Genentech, Inc., 2015). In 2005, restrictions were placed on the use of gefitinib in the United States (U.S. Food and Drug Administration [FDA], 2005). Subsequent to this restriction, the FDA (2015) approved gefitinib for first-line treatment of patients with NSCLC with exon 19 deletion (del19) or exon 21 L858R substitution mutations. Enhanced anaplastic lymphoma kinase (ALK) activity was discovered in NSCLC in 2007. In 2010,