Leptomeningeal metastases are more common in NSCLC patients with EGFR mutations

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Leptomeningeal metastases (LM), a devastating complication and predictor of poor survival in lung cancer patients, was found to be more prevalent in non-small cell lung cancer (NSCLC) patients with epidermal growth factor receptor (EGFR) mutations. Patients receiving tyrosine kinase inhibitors (TKIs) targeting EGFR mutations had a longer overall survival (OS) than those who did not receive TKIs, demonstrating the effectiveness of TKIs for LM therapy.

The leptomeninges are the membranes that surround the brain, including the arachnoid mater and pia mater, and ensue when cancer cells metastasize to intracranial structures and the cerebrospinal fluid (CSF). LM occurs in 10-26% of lung cancer and the presence of LM is a devastating complication for patients and often associated with poor survival. Treatment strategies for LM include epidermal growth factor receptor tyrosine kinase inhibitors (EGFR-TKIs), chemotherapy, whole brain radiotherapy (WBRT), intrathecal chemotherapy (ITC), surgery, and ventriculoperitoneal (VP) shunt operations. However, therapeutic options for treating LM are challenging with no standard treatment. The use of EGFR-TKIs markedly prolong survival in patients with EGFR mutations and frequent EGFR mutations.

A group of Chinese investigators retrospectively screened 5,387 NSCLC patients at Guangdong Lung Cancer Institute, Guangdong General Hospital, from January 2011 to June 2015 to examine the prevalence of

EGFR mutations in NSCLC patients with LM as well as treatments and clinical outcomes. Medical records of patients were reviewed for demographics, tumor-related features, and major treatments. Patients with known EGFR status were screened for LM by cerebrospinal fluid (CSF) cytology test or gadolinium-enhanced brain magnetic resonance imaging (MRI). OS was determined from the period of LM diagnosis to death or last follow-up. OS was estimated using the Kaplan-Meier method and presented as a median value with a two-sided 95% confidence interval (CI).

The results of the study published in the *Journal of Thoracic Oncology*, the official journal of the International Association for the Study of Lung Cancer (IASLC), showed that of the 5,387 patients examined only 3,775 patients were tested for EGFR gene status. Of those tested for EGFR status, 1,258 patients had confirmed EGRF mutations and 2,517 had wild-type EGFR (no identified mutations). The incidence of LM in all 5,387 patients was 3.4% (184/5,387). However, the incidence of patients with LM harboring EGFR mutations (9.4%, 118/1258) were significantly more than those with a wild-type EGFR status (1.7%, 42/2,517; $\chi 2 = 122.9$, p