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Abstract

Brain Metastases from Non-Small Cell Lung Cancer with EGFR or ALK Mutations: A Systematic Review and Meta-Analysis of Multidisciplinary Approaches

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Objectives: To analyze outcomes of non-small cell lung cancer (NSCLC) patients with brain metastases harboring EGFR or ALK mutations and examine for differences between tyrosine kinase inhibitors (TKIs) alone, radiotherapy (RT) alone (either whole brain radiation therapy (WBRT) or stereotactic radiosurgery (SRS)), or combined TKIs and RT.

Methods: Thirty studies were identified. Patients: with brain metastases from NSCLC. Intervention: initial TKIs alone with optional salvage RT, RT alone, or TKIs and RT. Control: wild-type NSCLC and TKIs alone for mutational and treatment analysis, respectively. Outcomes: overall survival (OS) and intracranial progression-free survival (PFS). Setting: studies with mutation information.

Results: A total of 2,649 patients were included. Patients with ALK and EGFR mutations had significantly higher median OS (48.5 months, $p<0.0001$; and 20.9 months; $p=0.0006$, respectively) compared to wild-type patients (9.9 months). Similar median OS was noted between TKIs and RT (28.3 months), RT alone (32.2 months; $p=0.22$), or TKIs alone (23.9 months; $p=0.2$). Patients treated with TKIs and RT had higher median PFS (18.6 months; $p=0.06$) compared to TKIs alone (13.6 months) with no difference between TKIs and RT vs. RT alone (16.9 months; $p=0.72$). No PFS difference was found between WBRT and TKI (23.2 months; $p=0.72$) vs. WBRT alone (24 months) or SRS and TKI (16.7 months; $p=0.56$) vs. SRS alone (13.6 months).

Conclusions: NSCLC patients with brain metastases harboring EGFR or ALK mutations have superior OS compared to wild-type patients. No PFS or OS benefit was found with the addition of TKIs to RT.

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