Can Rapid EGFR Testing Speed Up Treatment Initiation in Lung Cancer?

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A rapid *EGFR*-specific assay allowed for quicker identification of *EGFR* mutation–positive non–small-cell lung cancer (NSCLC), and thus a shorter time to initiation (TTI) of EGFR-directed therapy, according to a new study.

"Because of the need to interrogate a growing number of genes, next-generation sequencing (NGS) has largely replaced traditional single-gene assays," wrote study authors led by Jochen K. Lennerz, MD, PhD, of Massachusetts General Hospital and Harvard Medical School in Boston. "Genotyping by NGS requires complex bioinformatics that can create treatment delays," and some with symptomatic NSCLC require treatment initiation before that molecular testing can be completed.

The authors tested whether the addition of an *EGFR*-specific rapid assay to NGS at the point of NSCLC diagnosis could reduce TTI of EGFR-directed therapy. They specifically selected the *EGFR* assay because of the mutations' relatively high prevalence in lung cancer, the lack of overlap with other clinically relevant molecular alterations, and the easy availability of the targeted agents used in *EGFR* mutation–positive patients. The results of their analysis were published in *JCO: Precision Oncology*.

The study included a total of 243 consecutive patients newly diagnosed with NSCLC between 2015 and 2017. Patients had a median age of 69.1 years, and most of the cohort were never- or light-smokers (54%). A total of 43 patients (18%) harbored *EGFR* mutations according to the rapid assay. The median turnaround time for NGS genotyping was 14 workdays, compared with 7 workdays for rapid testing ($P < .001$). One patient with an *EGFR* mutation was identified with NGS that was not found with rapid testing; there were no false positives with the rapid test when compared with NGS. This yielded an overall sensitivity of 98% and a specificity of 100% for the rapid *EGFR* assay.

Of the 43 patients with a mutation on rapid testing, 41 had sufficient follow-up after diagnosis to confirm TTI. Of those, 95% received an EGFR tyrosine kinase inhibitor (TKI) as first-line therapy; in a historical cohort used for comparison, 81% received such an agent in the first-line setting ($P = .04$). The median TTI in the new cohort was 3.1 weeks, compared with 5.3 weeks in the historical cohort ($P < .001$). Among 35 evaluable patients in the new cohort, 49% started TKI therapy prior to receiving NGS results.

Some patients who present with symptomatic disease might benefit from even more rapid initiation of therapy. The researchers tested an ultra-rapid workflow for 8 patients with such situations; in these patients, the median turnaround time for *EGFR* results was 1.5 days, and the median TTI of an EGFR TKI was 9 days.

"We demonstrate that expedited *EGFR* genotyping enables early intervention with targeted therapies and allows symptomatic patients to access effective treatments," the authors concluded. "The growing number of actionable targets substantiates the need for diagnostic strategies that expedite molecular analysis."

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