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Testing for EGFR mutations and ALK rearrangements is cost-effective in NSCLC

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Multiplexed genetic screening for epidermal growth factor receptor (EGFR) and anaplastic lymphoma kinase (ALK) gene rearrangements and subsequent biomarker-guided treatment is cost-effective compared with standard chemotherapy treatment without any molecular testing in the metastatic non-small cell lung cancer (NSCLC) setting in the United States.

In NSCLC there are specific genetic abnormalities within the tumor that can be exploited with drugs specific for the molecular abnormality. These molecularly-guided or targeted-therapies have been shown to be effective for tumors with EGFR mutations and ALK rearrangements thus leading to approved drugs and guidelines for molecular testing. However, the presence of EGFR mutations and ALK rearrangements is low in unselected NSCLC, 9.5% and 3.9%, respectively. Likewise there is a cost associated with molecular testing and the question of whether to wait for molecular results or start chemotherapy immediately has led to complexity in treatment decision-making.

Researchers at Harvard University constructed a microsimulation model to compare life expectancy and costs of multiplexed EGFR and ALK testing followed by molecularly-guided therapy versus chemotherapy with no testing, chemotherapy until the testing results and switch to targeted-therapy, or a complete course of chemotherapy followed by targeted-therapy if indicated.

Results published in the *Journal of Thoracic Oncology*, the official

journal of the International Association for the Study of Lung Cancer (IASLC), show that the incremental cost-effectiveness ratio (ICER) for testing and waiting for results compared to treatment with chemotherapy with no testing was $136,000 per quality-adjusted life year (QALY) gained, which is thought to provide a good value from a societal prospective. Both treatment approaches where chemotherapy was started and then either switched immediately to targeted-therapy or switched after a complete course of chemotherapy had less favorable ICERs. The test-and-treat and chemotherapy with immediate switch approaches yielded higher expected outcomes in terms of QALYs and life-years (LYs) than the complete chemotherapy before targeted-therapy approach. These results were robust across plausible ranges of model inputs.

Dorothy Romanus, lead author of the study, states "this analysis supports the value of multiplexed testing for EGFR and ALK gene rearrangements followed by molecularly-guided therapy in decisions surrounding coverage of related testing and targeted therapy. Ensuring patient access to said breakthrough therapies through lower cost sharing is key. As evidence evolves and testing for a wider range of known mutations in NSCLC enters routine care, it will be increasingly important for future economic analyses to consider multiplexed testing for multiple mutations in tandem to fully appreciate the value of personalized treatment in this disease."

More information: journals.lww.com/jto/Abstract/ … redictive.99001.aspx

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