Adding Immune Checkpoint Inhibitor to Standard Chemotherapy Regimen Improves Outcomes in Stage III Colon Cancer

Tecentriq plus FOLFOX chemotherapy after surgery reduced the risk of cancer recurrence or death by 50%.

June 3, 2025 By Dana-Farber Cancer Institute

Combining standard adjuvant chemotherapy with the immune checkpoint inhibitor atezolizumab [Tecentriq] leads to a significant improvement in disease-free survival in a subset of patients with Stage III colon cancer that is deficient in DNA mismatch repair (dMMR), Dana-Farber Cancer Institute investigator Dr. Jeffrey Meyerhardt and his colleagues report at the 2025 American Society of Clinical Oncology (ASCO) meeting.

These results stem from the ATOMIC trial, a Phase III multicenter, randomized, open-label study of patients with surgically resected Stage III dMMR colon cancer. The trial is sponsored by the National Cancer Institute (NCI) and led by the NCI-funded Alliance for Clinical Trials in Oncology, part of the National Clinical Trials Network (NCTN). Dr. Frank Sinicrope of Mayo Clinic was the overall study chair [presented] the findings [June 1] in the ASCO Plenary Session.

“We know from previous clinical trials that an immune checkpoint inhibitor is beneficial to patients with metastatic dMMR colon and rectal cancer, but it was unclear whether there would be a benefit in the adjuvant setting following surgery,” said Meyerhardt, senior author of the study and co-chair of the Alliance Gastrointestinal Committee. Meyerhardt is also the chief clinical research officer and co-director of the Colon and Rectal Cancer Center at Dana-Farber. “Now, through this NCI-funded trial, we’ve shown that the immune checkpoint inhibitor atezolizumab, when combined with standard chemotherapy, can help reduce the risk of recurrence by 50% in patients with dMMR colon cancer after surgery.”

Patients with the dMMR subtype of colon cancer (also referred to as MSI or MSI-high) carry tumors with a molecular characteristic known as microsatellite instability. This feature is often used as a biomarker to help predict which patients are likely to respond to immune checkpoint inhibitors, such as atezolizumab.

To test whether patients with Stage III colon cancer would benefit from the addition of this drug, which is an anti-PD-L1 monoclonal antibody, investigators launched the ATOMIC trial. The study randomized patients with resected Stage III colon cancer into two treatment groups: standard adjuvant chemotherapy (consisting of 5-fluorouracil, leucovorin, and oxaliplatin; abbreviated FOLFOX), and FOLFOX combined with atezolizumab. The primary endpoint of the study was disease-free survival; secondary endpoints were overall survival and adverse event profile.

From September 2017 to January 2023, a total of 712 patients (including one pediatric patient) were enrolled. The median age was 64 and over half of patients (55.1%) were female.

Results from the ATOMIC trial reveal that the three-year disease-free survival was 86.4% (95% confidence interval, 81.8 to 89.9) in the atezolizumab group and 76.6% (95% confidence interval, 71.3 to 81.0) in the FOLFOX alone group. This represents a statistically significant improvement in disease-free survival — reducing the risk of recurrence or death by 50% for patients treated with atezolizumab in combination with chemotherapy, compared to those receiving chemotherapy alone.

Colorectal cancer is a leading cause of cancer-related deaths in the United States and around the world. In addition, the rates of the disease among young adults (those under 50) have been on the rise for the last two decades — increasing by roughly 2.4% per year. And more young people are dying because their cancers are typically diagnosed at a more advanced stage. Until now, the only treatment for patients with stage 3 colon cancer has been standard adjuvant chemotherapy drugs, like the FOLFOX regimen.

“The results of the ATOMIC trial are extremely compelling and demonstrate a substantial benefit to patients,” said Meyerhardt. “Not only do they provide the evidence for a new standard of care in this subgroup of patients with colon cancer, but they also illustrate the power of the National Clinical Trials Network and federal funding from the NCI to test clinical hypotheses and ultimately improve the lives of cancer patients.”

In addition to sponsorship by the NCI, the ATOMIC trial is also conducted in partnership with Genentech, a member of the Roche Group, through a Cooperative Research and Development Agreement (CRADA). The trial was also open in partnership with the German group Arbeitsgemeinschaft Internistische Onkologie (AIO). To learn more about the ATOMIC trial, visit ClinicalTrials.gov.

This news release was published by Dana-Farber Cancer Institute on June 1, 2025.

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