Does Cancer Treatment Increase COVID-19 Risk?

Recent studies suggest chemotherapy and immunotherapy are not linked to more severe COVID-19.

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People living with cancer and their doctors have been concerned that cancer treatment, especially chemotherapy, could raise the risk of more severe COVID-19, but recent research helps allay such fears.

Many chemotherapy drugs kill immune system white blood cells, leaving people less able to fight off infections. Early in the pandemic, immune suppression was identified as a risk factor for severe COVID-19 in China, and studies in other hard-hit epicenters showed that people with cancer—in particular those with active disease and those who had recently received chemo—had higher rates of severe illness and death.

But now that clinicians have learned how to better manage COVID-19 and have had time to do larger and more thorough analyses, outcomes for people with cancer—including those undergoing treatment—appear to have improved.

“If you’re an oncologist and you’re trying to figure out whether to give patients chemotherapy, or if you’re a patient who needs treatment, these findings should be very reassuring,” said Ying Taur, MD, MPH, of Memorial Sloan Kettering Cancer Center in New York, a coauthor of one of the recent studies.

Chemotherapy and COVID-19

As described in the Journal of Clinical Oncology, Justin Lee, MD, PhD, and colleagues reviewed outcomes among 309 patients with cancer and COVID-19 treated at Memorial Sloan Kettering through the end of March, with follow-up through mid-April. About half were over age 60, half were men and two thirds were white. A third had recently received cytotoxic chemotherapy—drugs that kill blood cells and other healthy cells along with cancer cells.

During follow-up, 147 people (48%) were hospitalized, 31 (10%) died and 120 (39%) met the study’s primary end point of severe or critical COVID-19. In a matched group of cancer patients who tested negative for the coronavirus, the corresponding rates were 33%, 6% and 17%.

As seen in other studies, people with blood cancers (such as leukemia or lymphoma) and lung cancer fared worse than those with other malignancies. People in remission appeared to have better outcomes than those with active disease.

The researchers found that, overall, receiving cytotoxic chemotherapy within the three months prior to COVID-19 diagnosis was not significantly associated with a higher likelihood of severe events including intensive care unit (ICU) admission and death. Cancer patients on chemo also did not appear more likely to acquire the coronavirus.

People who had low lymphocytes levels (lymphopenia) around the time of their COVID-19 diagnosis had about twice the risk of severe illness, and those who already had a low level of infection-fighting neutrophils (neutropenia) at the start of follow-up had about a fourfold higher risk of poor outcomes. But only four patients fell into the latter category, all of whom had blood cancers.

People who were treated with tyrosine kinase inhibitor targeted therapy (49 patients) or immunotherapy (18 patients) appeared somewhat more likely to have poor outcomes, but the number of patients on these types of treatment was small, making it hard to draw firm conclusions.

“From our study, the chemotherapy treatment itself does not appear to cause additional adverse outcomes from having COVID-19,” lead study author Melissa Pessin, MD, PhD, of Memorial Sloan Kettering, told Healio. “Patients should discuss their concerns with their oncologist, but for most people, the potential benefits of their treatment will outweigh any additional potential risks with COVID-19 from that treatment; however, some treatment regimens may require modifications to further minimize risk.”

What About Immunotherapy?

The question of whether immunotherapy affects COVID-19 outcomes is somewhat murkier, as studies to date have yielded conflicting results.

Some of the severe complications of COVID-19 are attributable to an overactive immune response known as a cytokine storm. Immune checkpoint inhibitors, which boost T-cell activity, could potentially help the body fight the coronavirus—or they could make matters worse.

Taur, Elizabeth Robilotti, MD, MPH, Mini Kamboj, MD, and colleagues analyzed data from 423 cancer patients at Memorial Sloan Kettering who were diagnosed with symptomatic COVID-19 between March 10 and April 7. A majority were 60 or older, half were men and nearly two thirds were white. Breast cancer was most common (20%), followed by lymphoma (11%) colorectal cancer (9%), lung cancer (8%) and leukemia (8%). Thirty-one received checkpoint inhibitors.

The patients were followed for at least 30 days. “Having that follow-up time is something that a lot of other studies have not included because everyone is in a rush to get their data out,” Kamboj said in a press release. “We wanted to give patients enough time to recover and make sure they

didn’t need to be readmitted to the hospital.” She also noted that even at the peak of the New York City outbreak, Memorial Sloan Kettering did not run short of space, supplies or equipment such as ventilators.

As described in Nature Medicine, 40% of the patients were hospitalized for COVID-19, 20% were admitted to the ICU, 20% developed severe respiratory illness, 9% required ventilators and 12% died.

In this study, treatment with checkpoint inhibitors was associated with about a threefold higher likelihood of hospitalization and severe disease.

This finding was largely driven by the 35 people with lung cancer. In this subgroup, 85% of those on immunotherapy were hospitalized and 58% had severe disease, compared with 52% and 35%, respectively, among those not receiving this type of treatment. A similar, though less strong, association was seen for people with other types of solid tumors.

Here, too, receiving chemotherapy within the past month was not associated with worse outcomes, nor was undergoing cancer surgery.

In fact, Taur noted that some of his patients who had recently received bone marrow stem cell transplants for leukemia, which requires strong chemotherapy, did not have any COVID-19 symptoms. “If you think about it more, it makes sense,” he says. “Most of the complications seen in people with COVID-19 seem to be caused by the body’s immune response to the virus.”

People with blood cancers, older patients, those who were not white, those with other preexisting health conditions, those with chronic lymphopenia and those who used corticosteroid medications were more likely to be hospitalized. However, the researchers saw no significant association with cancer type or metastatic disease.

“Even with immune checkpoint inhibitors, though, these findings should not affect whether patients get treated,” Kamboj emphasized. “Everyone who needs these drugs should still receive them. It’s just important for doctors to be extra vigilant about testing and monitoring for the virus and for people with cancer to take extra precautions to avoid infection.”

Another study, presented at the at the American Association for Cancer Research COVID-19 and Cancer virtual meeting in July, found that checkpoint inhibitor immunotherapy did not increase the risk of death in people with cancer the coronavirus.

Aljosja Rogiers, MD, of the Melanoma Institute Australia, and colleagues analyzed data from 113 people with COVID-19 who were treated with checkpoint inhibitors without chemotherapy at 19 hospitals in North America, Europe and Australia. About two thirds were men and the median age was 63. The most common cancers were melanoma (57%), lung cancer (17%) and kidney cancer (10%). Three quarters had advanced cancer. About half stopped immunotherapy during follow-up.

The researchers reported that 29% of the patients were hospitalized, 5% were admitted to an ICU and 8% died. COVID-19 was the primary cause of death for seven of the nine people who died.

Although the COVID-19 mortality rate was higher for cancer patients on checkpoint inhibitors compared with rates reported for the general population, it appeared similar to rates for people with cancer who did not receive this type of treatment, Rogiers said.

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