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Small Risk Seen for Second Ca from Radiation Tx

By John Gever, Senior Editor, MedPage Today
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MedPage Today Action Points

- Explain that in an analysis that included thousands of cancer survivors, new tumors found in patients who had previously received radiation therapy for cancer were only rarely attributable to that treatment.
- Note that patients included in the analysis were treated before the widespread adoption of intensity-modulated radiotherapy, which increases the volume of tissue exposed to low-level radiation compared with other techniques.
- Further note that in this analysis, the relative risk for a patient developing a second cancer who had previously received radiotherapy varied according to the type of first cancer -- with breast cancer at the low end and testicular cancer at the high end.

Review

New tumors found in patients who had previously received radiation therapy for cancer were only rarely attributable to the treatment, according to a large data analysis.

Among thousands of cancer survivors treated with radiation who were later diagnosed with a second solid-tumor cancer, only 8% "could be related to radiotherapy," according to Amy Berrington de Gonzalez, PhD, of the National Cancer Institute in Bethesda, Md., and colleagues.

This estimate -- derived from data on nearly 650,000 patients in the Surveillance, Epidemiology, and End Results (SEER) cancer registry -- translated to five excess cancers per 1,000 radiotherapy-treated patients within 15 years of treatment, the researchers reported online in *Lancet Oncology*.

Berrington de Gonzalez and colleagues noted that patients in the analysis were treated before the widespread adoption of intensity-modulated radiotherapy, which increases the volume of tissue exposed to low-level radiation compared with other techniques.

They said the possibility that this change in practice increases the risk of second cancers should be addressed in future research.

Still, the researchers asserted, "even if current practice substantially changed radiation doses to some organs, the general message remains unchanged: the

second cancer risks from radiotherapy in adulthood are relatively small, especially when compared with the treatment benefits."

The study drew on SEER data for 15 types of cancer often treated with radiation: oropharyngeal, salivary, laryngeal, lung, rectal, anal, soft tissue, female breast, cervical, endometrial, prostate, testicular, ocular/orbital, brain, and central nervous system.

Patients were included if they were at least 20 years old at diagnosis from 1973 to 2002 and survived at least five years.

A total of 647,672 such patients were identified in the registry, for whom a mean 12 years of follow-up (range five to 34) were available. Of these, about half actually had received radiation treatment.

Second tumors were diagnosed during follow-up in a total of about 60,000 patients -- including more than 42,000 who had received radiation treatment.

The relative risk for a patient developing a second cancer who had previously received radiotherapy varied according to the type of first cancer.

At the low end were female breast tumors, with a relative risk of 1.10 (95% CI 1.07 to 1.13) for previous radiotherapy.

The highest risk was seen in patients with testicular cancer at original diagnosis (RR 1.43, 95% CI 1.13 to 1.84).

Berrington de Gonzalez and colleagues also found that sites of second cancers tended to be in organs or tissues that would have received more than 5 Gy of radiation during the therapy.

But when Berrington de Gonzalez and colleagues looked at "excess cancers" in patients whose records showed radiotherapy for the original cancer, the numbers attributable to radiation treatment were relatively small.

Subtracting the number of second tumors that would be expected to develop in patients not treated with radiotherapy (estimated from regression models of the SEER data) from the number actually seen yielded a total 3,266 excess cancers in the 42,294 radiotherapy-treated patients who were later diagnosed with second cancers.

The proportion translated to 8% (95% CI 7% to 9%) of second tumors in radiotherapy -treated patients that could be related to the treatment.

This figure varied considerably with the type of original cancer: from 5% for female breast cancer (95% CI 4% to 7%) to 24% for testicular cancer (95% CI 9% to 37%).

Notably, second tumors diagnosed within five years of first-cancer treatment were not counted in the study -- partly because the authors believed that such tumors were unlikely to be radiotherapy-related and partly to exclude the possibility of surveillance bias.

The latter was a concern because patients may be watched more closely in the first years after treatment relative to later on.

Limitations to the analysis include the lack of data on potential confounders such as smoking status, chemotherapy, and hormonal treatments patients may have received.

Berrington de Gonzalez and colleagues noted that these factors could easily be related to decisions on whether to prescribe radiotherapy rather than surgery.

But when they restricted their analysis to patients whose records indicated some type of surgical therapy, the results were similar to the findings for the entire group, they indicated.

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