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#6 in a Series

FOCUS: Thyroid Cancer

Treatment & Research Updates

[INSIDE]

Use of Ultrasound Criteria May Help Reduce Unnecessary Thyroid Biopsies	2
Thyroid Cancer Survival Rates High After Chernobyl Disaster Despite Lag in Care	4
Combination of BRAF Inhibitor Plus MEK Inhibitor Promising for Papillary Thyroid Cancer and Other Solid Tumors	10
Medullary Thyroid Cancer: Cabozantinib Extends Progression-Free Survival in Patients with RET or RAS Mutations	11

Thyroid Cancer Survival Rates High After Chernobyl Disaster Despite Lag in Care

BY RABIYA S. TUMA, PHD

After the Chernobyl nuclear accident in 1986, public health officials feared there would be a high incidence of and mortality from thyroid cancer in radiation-exposed children and adolescents. However, with a median follow-up of just over 11 years, researchers now report a very high rate of survival among 234 children and adolescents from the Republic of Belarus who underwent radioiodine therapy in Germany for the treatment of very high-risk thyroid cancer.

“Even though some patients did not receive optimal treatment initially, the vast majority went into remission after receiving state-of-the-art radioiodine treatment and follow-up care,” the lead author of the study, Christoph Reiners, MD, of the University of Würzburg, Germany, said in a news release from the Endocrine Society about the study, published in the organization’s *Journal of Clinical Endocrinology & Metabolism* (2013;98:3039-3048).

“Many patients recovered from advanced cancers. Of this group, 97 percent had cancer spread to the lymph nodes, and 43 percent had cancer metastasize in the lungs.”

During their treatment in Germany, 134 children and adolescents without distant metastases received a median of two courses of radioiodine therapy (range of one to five), for a median cumulative dose of 6.6 GBq (141 MBq/kg). The 100 patients with distant metastases received a median of four (range of 2-12) courses of radioiodine therapy, for a median cumulative dose of 16.9 GBq (268 MBq/kg).

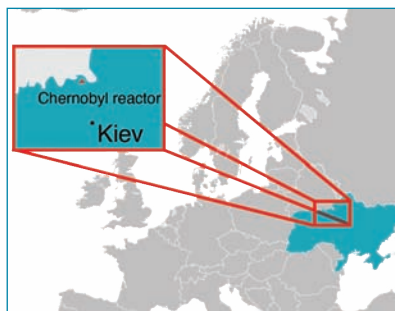
The median lag between the patients’ last surgery and their first radioiodine treatment was 0.7 years, with a maximum of 5.5 years.

Of those patients treated, 229 completed their recommended course of therapy and were available for follow-up. One hundred forty-seven (64%) had a complete response, 69 (30%) had a “nearly complete remission,” and 11 (5%) had a partial response.

As expected, patients with localized disease were more likely to have a complete response than were those with distant metastases (77% vs. 47%).

Median follow-up is now 11.2 years for patients with a complete response and 14.9 years for those with a partial response. At 10 years, the progression-free survival rate was 100 percent for patients with a complete response and 92 percent for those with a partial response.

continued on page 5



→ULTRASOUND CRITERIA

continued from page 3

features, on ultrasound including microcalcifications, irregular margins, and increased vascular flow.

Still, the editorial noted, while the findings validate the results from less rigorous retrospective analyses, all of the data about suspicious nodules were based on characteristics of just 96 malignant tumors. And unlike the 1.6 percent prevalence among patients in the study, most research on thyroid cancer nodules place that rate at between eight and 15 percent, Cooper and Alexander wrote. “These facts suggest a nonrepresentative study population and an increased potential for sampling bias.”

‘Major Epidemiological Debate’

Whether or not to conduct biopsies on all nodules has become “a major epidemiological debate,” Cooper noted. “If we could find a foolproof way of validating whether the characteristics can detect all cancers, maybe we would not have to perform so many biopsies. But no test is 100 percent accurate. Even if this strategy detects almost all cancers, there is still a risk, however small. You can never rule out that a patient does not have cancer without a biopsy, and most people in the United States just will not accept this.”

The concept is correct, but support from patients is the real issue, he said. In addition, there is a degree of subjectivity in sonogram interpretation, and not all radiologists always provide a description of nodule characteristics.

“Things are getting better, but there is often a paucity of data on which to make a decision to biopsy or not,” Cooper continued. “I do about 15 biopsies every week and have found that about half of the patients did not need one. There is patient anxiety to consider as they await biopsy

“Doing unnecessary procedures—be it an imaging test, biopsy, or even open surgical biopsy because the initial biopsy was questionable, which is often the case in the thyroid—is not only costly, and time consuming, but also unpleasant and painful for patients.”

results, and biopsies are expensive. One in 100 [malignancies] look benign on physical examination, but patients want them.”

→CHERNOBYL

continued from page 4

Overall, two patients have had local recurrences—one at 3.2 years and another at 10.7 years; both patients responded well to subsequent radioiodine treatment, the researchers reported.

Although none of the patients have died due to their cancer, one patient who had a nearly complete response to treatment died of pulmonary fibrosis 19 years after treatment. Two others died of unrelated causes.

Clinicians have seen pulmonary fibrosis in six more patients, though two cases appeared to be transient. All seven individuals had diffuse lung metastases and high thyroglobulin levels (290–9760 µg/L) before treatment. They received from three to 10 courses of radiotherapy, with

“Even though some patients did not receive optimal treatment initially, the vast majority went into remission after receiving state-of-the-art radioiodine treatment and follow-up care.”

cumulative doses of 4.6 to 22.1 GBq (276–967 MBq/kg). Additionally, four patients received bleomycin chemotherapy, although the patient who died from pulmonary fibrosis did not.

The researchers have not seen other late effects of therapy in this patient group. They note there have been no hematologic malignancies in these patients, and fertility appears comparable to that in their peers in Belarus.

‘Good News, But Longer Follow-Up Still Needed’

Asked for an opinion for this article, Jason Wexler, MD, an endocrinologist with the Thyroid/Metabolic Bone Unit at MedStar Washington (D.C.) Hospital Center, noted that at the time of the accident in 1986 it was known that children with thy-

roid cancer usually did very well with standard treatment. “But what we really didn’t know—since Chernobyl was a unique occurrence—was, would thyroid cancer that affected children due to radiation fallout exposure behave differently than sporadic thyroid cancer that would [otherwise] occur in children. That was the unknown.

“What is encouraging about these results, and is perhaps a surprise, is that these children who developed thyroid cancer due to a radiation exposure from a nuclear accident did very well,” he said in a telephone interview.

Still, he cautioned that an 11-year follow-up is not very long in the life of a child. He said the results make him think of one of his own patients who had been treated for sporadic thyroid cancer at the age of four in another country, lived without recurrence for many years, but then died from the disease at the age of 34.

“How do you cut that? On the one hand, he survived for 30 years after thyroid cancer treatment; on the other hand he died in his mid-30s. Is that good or bad?”

Wexler also expressed concern about the 7.2 percent of patients treated for lung metastases who have developed persistent

pulmonary fibrosis. “I think that is a significant number and it is worrisome over a follow-up of only 10 or 11 years,” he said.

Despite the caveats, the overall message from the analysis is a good one, according to Wexler as well as the study authors. Even though these patients had less than optimal treatment initially, they have done quite well. And these data, both Wexler and the study authors agree, bode well for the children and adolescents who were near the Fukushima Daiichi nuclear accident that followed the earthquake and tsunami in March 2011 in Japan. Moreover, the public health efforts to protect individuals through sheltering, evacuations, avoidance of contaminated foods, and distribution of stable iodine tablets, will also likely lessen the overall risk of thyroid cancer.

In the meantime, longer follow-up is required for the thyroid cancer survivors in Belarus. “At this point, these data are encouraging, but the full story has yet to be written because these kids need to be followed for a long time to really know what the long, long-term outcome is going to be,” Wexler said. “That is what has me worried.”



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