



THYROID CANCER

Radioactive iodine doses exceeding 100 mCi increase the risk for developing leukemia

BACKGROUND

In patients with advanced or high risk thyroid cancer, radioactive iodine is a very effective treatment and can be curative. It is well known that exposure to radiation is a risk factor for the development of leukemia, so patients treated with radioactive iodine have been followed since this therapy was started. It is clear that very high radioactive iodine doses (doses exceeding 600 mCi) were associated with an increased risk for developing leukemia. However, usual treatment doses of radioactive iodine were not believed to have this adverse effect. The current study by a Korean group involved over 200,000 patients with thyroid cancer and sheds new light on risk of leukemia after radioactive iodine therapy for thyroid cancer.

THE FULL ARTICLE TITLE

Seo GH et al. Increased risk of leukemia after radioactive iodine therapy in patients with thyroid cancer: a nationwide, population-based study in Korea. *Thyroid*. July 2, 2015 [Epub ahead of print].

SUMMARY OF THE STUDY

The authors obtained data from the National Health Insurance database of Korea, which includes the entire population of Korea. They identified 211,360 patients with thyroid cancer newly diagnosed between 2008 and 2013; there were 542,845 patient-years of follow-up. Patients were categorized into five groups based on their cumulative dose of radioactive iodine: 1 = no radioactive iodine, 2 = low-dose radioactive iodine (<30 mCi), 3 = moderate-dose radioactive iodine (31 to 100 mCi), 4 = high-dose radioactive iodine I (101 to 150 mCi), and 5 = very-high-dose radioactive iodine (>150 mCi). The number of patients with thyroid

cancer per year increased from 25,437 in 2008 to 41,248 in 2013; 82% were female. The average age at diagnosis was 48 years. A total of 49% (103,741) underwent treatment with radioactive iodine, with an average total dose of 100 mCi. The average follow-up period was 29 months. During the study period, there were 72 cases of leukemia, 46 in the radioactive iodine group and 26 in the no-radioactive iodine group. The risk of leukemia was higher in those who received >100 mCi, as compared with those who received no radioactive iodine. Patients who received low- or moderate-dose radioactive iodine did not have a statistically significant risk for leukemia. The risk for development of leukemia in those who received >100 mCi of ¹³¹I increased significantly as early as 9 months after radioactive iodine.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

While the overall risk of developing leukemia after radioactive iodine therapy for thyroid cancer is very low, it is clearly dose-related. Doses of radioactive iodine exceeding 100 mCi were strongly associated with the development of leukemia, but lower radioactive iodine doses were not. This is important when deciding the risks vs benefits of radioactive iodine therapy as well as determining a dose of radioactive iodine when treating thyroid cancer.

— Alan P. Farwell, MD, FACE

ATA THYROID BROCHURE LINKS

Thyroid cancer: <http://www.thyroid.org/cancer-of-the-thyroid-gland>

Radioactive Iodine Therapy: <http://www.thyroid.org/radioactive-iodine>

ABBREVIATIONS & DEFINITIONS

Radioactive iodine (RAI): this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer and with an overactive thyroid. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the

thyroid (Thyroid Scan) or to take pictures of the whole body to look for thyroid cancer (Whole Body Scan).

mCi: millicurie, the units used for radioactive iodine.

Leukemia: cancer of the white blood cells