

**THYROID CANCER****Does metformin protect the bone marrow of patients treated with radioactive iodine for thyroid cancer?****BACKGROUND**

Radioactive iodine therapy plays an essential role in treating many patients thyroid cancer. While radioactive iodine is taken up and concentrated only in thyroid cells, most tissues of the body get exposed to low doses of radiation while it remains in the bloodstream. The most sensitive cells to radiation are in the bone marrow and it is known that radioactive iodine therapy leads to a decrease in both white blood cell (WBC) and platelet counts in 15-25% of patients. These cells return to normal several months after radioactive iodine therapy and there does not appear to be a significant clinical effect due to this decrease.

Some small studies have implied that patients with diabetes who take metformin have a lower risk for some cancers. Additionally, a small study of thyroid cancer patients with diabetes reported that patients who took metformin had smaller cancers and were cancer-free for longer periods of time after treatment. This study examined a single institutions' experience with thyroid cancer patients with diabetes treated with radioactive iodine therapy to see if metformin had any effect on white blood cell and platelet counts after therapy.

THE FULL ARTICLE TITLE

Bikas V et al. Metformin attenuates ¹³¹I-induced decrease in peripheral blood cells in patients with differentiated thyroid cancer. *Thyroid* 2016;26: 280-6

SUMMARY OF THE STUDY

A total of 77 thyroid cancer patients were studied: 57 diabetic (40 taking metformin, 17 that were not) and 22 non-diabetic. All were treated with a total thyroidectomy

and radioactive iodine therapy that had available blood work and follow-up.

At 1 and 6 months after radioactive iodine therapy, the WBC count has fallen twice as much in diabetics not taking metformin compared to those taking metformin; at one year, the WBC count was back to normal in metformin patients but still 20% lower than baseline in those that were not taking metformin. The platelet count fell the most, though similarly in both groups during the first 6 month, but at 1 year was only 16% below baseline in the metformin group compared to 40% below baseline in the non-metformin group. There was no change in red-cell count and the dose of metformin did not mater.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that the WBC and platelet counts do indeed fall after radioactive iodine therapy and that metformin appears to be protective in preventing this fall in patients with diabetes. At this point, since the fall in these cells does not appear to be cause a significant clinical effect, metformin should not be used in non-diabetic patients for this purpose but may be considered in patients that have low blood counts from other co-existing medical problems. Further research needs to be done on whether metformin can decrease some of the effects of chemotherapy and radiation on the bone marrow for other cancer treatments.

— Melanie Goldfarb MD, MS, FACS, FACE

ATA THYROID BROCHURE LINKS

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

ABBREVIATIONS & DEFINITIONS

Radioactive iodine: 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.

Total thyroidectomy: surgery to remove the entire thyroid gland.

Bone Marrow: the internal center of bones that generate the cellular components of the blood: red blood cells, white blood cells and platelets

White blood cells (WBC): the infection-fighting cells of the blood.

Platelets: the clotting cells of the blood.