CLINICAL **THYROIDOLOGY** FOR THE **PUBLIC**

A publication of the American Thyroid Association

AMERICAN THYROID ASSOCIATION

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THYROID CANCER

Recurrence rates in patients with intermediate-risk thyroid cancer are similar after low-dose and high-dose radioactive iodine therapy

BACKGROUND

Current management of thyroid cancer involves a determination of the risk of relapse of the cancer when determining the best treatment plan. Low risk thyroid cancer is usually treated with surgery (total thyroidectomy or lobectomy) and thyroid hormone therapy. Standard treatment for intermediate and high risk thyroid cancer includes surgery, usually a total thyroidectomy, followed by radioactive iodine therapy and thyroid hormone therapy. The radioactive iodine treatment is used to remove any remaining thyroid tissue, both normal and cancerous tissue. The best radioactive iodine dose is still controversial. Prior studies have reported that low-dose radioactive iodine therapy may be just as effective as high-dose therapy in patients with intermediate risk thyroid cancer. However, these studies were different and most patients were followed only for a short period of time. The goal of this study was to evaluate the response to low-dose and high-dose radioactive iodine therapy, including the recurrence rate during long-term follow-up in patients with intermediate risk thyroid cancer.

THE FULL ARTICLE TITLE

Jeong et al. Clinical outcomes of low-dose and high-dose postoperative radioiodine therapy in patients with intermediate-risk differentiated thyroid cancer. Nucl Med Commun. 2017 Mar;38(3):228-233.

SUMMARY OF THE STUDY

This is a study of 204 thyroid cancer patients who had minimal invasion outside the thyroid gland or spread to the lymph nodes in the neck at the time of diagnosis. The patients underwent a total thyroidectomy with or without neck dissection followed by radioactive iodine therapy at two referral hospitals in an iodine-replete area in Korea from 2003 to 2004. A total of 90% of patients were women and the average age was 45 years. The majority (97%) of patients had papillary thyroid cancer while 3% had follicular thyroid cancer. Overall 34% of patients had cancers larger than 2 cm and 60% had spread to the lymph nodes. Of the 204 patients, 80 patients received low-dose radioactive iodine therapy at one center, while 124 patients received high-dose radioactive iodine therapy at the second center. The patients in the low-dose and high-dose groups had similar characteristics with the exception of a higher rate of minimal invasion outside the thyroid gland in the low dose group (90% vs. 76%). All patients underwent thyroid hormone withdrawal for at least 3 weeks and followed a low-iodine diet for 2 weeks before the radioactive iodine treatment. The patients were started on long-term thyroid hormone therapy after the radioactive iodine treatment.

The results of the radioactive iodine therapy were assessed within 2 years after the therapy. A successful treatment was defined as a thyroglobulin level of less than 0.2 ng/ml on thyroid hormone treatment or a stimulated thyroglobulin of less than 1 ng/ml after thyroid hormone withdrawal, a negative neck ultrasound and negative whole body scan (WBS). There was no difference in the radioactive iodine treatment success rate between the low-dose and high-dose groups based on the thyroglobulin measurement and neck ultrasound with a negative whole body scan (45% versus 55%) or without whole body scan results (63% and 61%). However, the rate of incomplete response to radioactive iodine treatment was higher in the low-dose as compared to the high-dose group (25% versus 11%). A total of 18 patients in the low-dose group and 8 patients in the high-dose group received additional radioactive iodine therapy.

The patients were monitored for recurrence with thyroglobulin tests, neck ultrasound and whole body scanning for a average of 10 years. During the follow-up period, 7 patients in the low-dose group (9%) and 7 patients in the high-dose group (6%) developed cancer recurrence. Importantly, all patients with a successful initial radioactive iodine treatment were disease-free during the entire follow-up.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Patients in the low-dose group had higher rates of incomplete response to the initial radioactive iodine

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therapy requiring additional radioactive iodine therapy as compared to the high-dose group. The low-dose group may also have a slightly higher recurrence rate during long-term follow-up. These data show that the low-dose radioactive iodine therapy is not sufficient for the treatment of intermediate-risk thyroid cancer patients.

— Alina Gavrila, MD, MMSC

ATA THYROID BROCHURE LINKS

Thyroid Cancer (Papillary and Follicular): http://www.thyroid.org/thyroid-cancer/

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

Thyroid Surgery: http://www.thyroid.org/thyroid-surgery/

ABBREVIATIONS & DEFINITIONS

Differentiated thyroid cancer: includes papillary (the most common) and follicular thyroid cancer.

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. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the whole body to look for thyroid cancer (Whole Body Scan).

Total thyroidectomy: surgery to remove the entire thyroid gland.

Thyroid hormone therapy: patients with hypothyroidism are most often treated with Levothyroxine in order to return their thyroid hormone levels to normal. Replacement therapy means the goal is a TSH in the normal range and is the usual therapy. Suppressive therapy means that the goal is a TSH below the normal range and is used in thyroid cancer patients to prevent growth of any remaining cancer cells.

Thyroid hormone withdrawal: this is used to produce high levels of TSH in patients by stopping thyroid hormone pills and causing short-term hypothyroidism. This is mainly used in thyroid cancer patients before treating with radioactive iodine or performing a whole body scan.

Lymph node: bean-shaped organ that plays a role in removing what the body considers harmful, such as infections and cancer cells.

Neck lymph node dissection: systematic removal of an entire group of lymph nodes from the neck to treat lymph node metastasis.

Thyroglobulin: a protein made only by thyroid cells, both normal and cancerous. When all normal thyroid tissue is destroyed after radioactive iodine therapy in patients with thyroid cancer, thyroglobulin can be used as a thyroid cancer marker.

Stimulated thyroglobulin testing: this test is used to measure whether there is any cancer present in a patient that has previously been treated with surgery and radioactive iodine. TSH levels are increased, either by withdrawing the patient from thyroid hormone or treating the patient with recombinant human TSH (Thyrogen), then levels of thyroglobulin are measured. Sometimes this test is combined with a whole body iodine scan.

Diagnostic whole body scans: these radioactive iodine scans are performed under TSH stimulation, either after thyroid hormone withdrawal or after injections of recombinant human TSH, and usually include measuring serum thyroglobulin levels.