Successful Ablation of Thyroid Remnants Can Be Achieved with Two 20 mCi (740 MBq) Doses of ¹³¹I

Clerc J, Bienvenu-Perrard M, Pichard de Malleray C, Dagousset F, Delbot T, Dreyfuss M, Groussin L, Marlowe RJ, Leger FA, Chevalier A. Outpatient thyroid remnant ablation using repeated low 131-iodine activities (740 MBq/20 mCi x 2) in patients with low-risk differentiated thyroid cancer. J Clin Endocrinol Metab. 2012;97:871-80.

Background

Differentiated thyroid carcinoma (DTC) classified as low risk has a low rate of recurrence and very low mortality. After surgical thyroidectomy, many patients with DTC currently are not treated with ¹³¹I for ablation of remnant thyroid tissue. On the other hand, there has been renewed interest in using the smallest effective dose of ¹³¹I for ablation rather than giving an arbitrary dose of 100 mCi (3.7 GBq) for these patients. The current paper describes the efficacy of using a minidose protocol of two doses of 20 mCi (740 MBq) ¹³¹I given 6 to 18 months apart.

Methods

The study included 160 consecutive patients with well-differentiated thyroid cancer who underwent total thyroidectomy and were classified as pT1/ N0-Nx disease during the period 2001–2011. After 2 weeks on a low-iodine diet, the patients were given an ablative dose of 740 MBq ¹³¹I and then had scans 2 or 3 days later. A second dose of 740 MBq ¹³¹I was given 6 to 18 months later. The doses were given after rhTSH or after 4 weeks of T₄ withdrawal. Ablation success at minidose 2 also was the end point of a multivariate analysis to identify factors present at minidose 1 that independently predicted this outcome. The ultimate objective of the analysis was to identify factors indicating that the second minidose of ¹³¹I might be omitted. Patients underwent ultrasonography in follow-up and measurements of Tg. Successful ablation was defined as the combination of: (1) no visible thyroidbed uptake on whole-body scintigraphy with 740 MBq (740 WBS) or cervical uptake below 0.1%, and (2) undetectable Tg (<1 ng/ml).

Clinical

THYROIDOLOGY

Results

Nine patients were found to have positive imaging in nodes or distant disease, five on the first scan and five others on the second scan, and were excluded from the analysis.

The ablation success rate was 75.9% after one 740-MBq dose in 145 patients and 90.2% after the second dose in 132 evaluable patients. About 10% had no thyroid remnant and had ablation by surgery alone. Patients who underwent successful ¹³¹I-ablation tended to be younger (P<0.02). Stimulation by rhTSH with the first minidose ablation was associated with more successful ablation (81%) than with thyroid hormone withdrawal (52%), but the opposite occurred with the second minidose (13% with rhTSH vs. 52% with thyroid hormone withdrawal). The strongest predictor of successful ablation at minidose 2 was Tg <10 ng/ml at minidose 1, which indicated a smaller remnant. Tumor size and multifocality did not predict successful ablation. There was no evidence of recurrent disease in 81 patients with prolonged follow-up.

Conclusions

The minidose outpatient ablation protocol was effective and useful diagnostically in low-risk patients with DTC.

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ANALYSIS AND COMMENTARY • • • • •

The success of the 20 mCi (740 MBq) 131 I ablation is probably attributable to the completeness of surgery. This is indicated by the stimulated Tg being <10 ng/ ml at the time of the first ablation dose. The additional success of the second minidose is its administration without prior 131 I diagnostic scan that could cause stunning of the tumor tissue and impair uptake of the treatment dose.

In recent years, there has been a trend to reduce the ablative dose of 131 I to 30 mCi or even 50 mCi, doses that were once commonly used in the United States in order to avoid the high cost of hospitalization for the therapy. A study of 555 patients given doses of 15 to 50 mCi (in groups with progressive 5 mCi increments) for ablation in India showed that a dose of at least 25 mCi was equally as effective as higher doses (1). In a comparison of 30 mCi and 100 mCi 131 I for ablation, the success rates were similar, but the higher dose caused more radiation thyroiditis (2). In addition, it

is well-established that the incidence of dry mouth and lacrimal-duct obstruction increase with increasing doses of ¹³¹I, so lower doses cause fewer adverse reactions.

A criticism of the ablation method used in this study is that it requires two sets of rhTSH injections, which increases the cost and inconvenience to the patient, but one could argue that a stimulated measurement of Tg and a follow-up scan should be performed in follow-up for any ablation protocol.

In evaluating this retrospective study, it is difficult to avoid the conclusion that many of these patients classified as pT1 with no evidence of nodal disease would not be treated with ¹³¹I ablation at the current time because of a lack of evidence of efficacy in these patients who have an excellent prognosis. Nevertheless, when a low-risk patient is treated, a low dose is likely to be effective, as indicated by this study.

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References

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