

## Outcome after radiiodine therapy in patients with Grave's disease: interrelation between demography and disorders properties.

Isabela S. Okuma\*, Isabella L. de C. Lima, Arnaldo M. Neto, Marcos A. Tambascia, Celso D. Ramos, Denise E. Zantut-Wittmann.

### Abstract

Graves disease is an autoimmune condition and the main cause of hyperthyroidism. The present study consists of the analysis of the evolution after radiiodine therapy treatment in patients with Graves' disease, which took place at the Thyroid Dysfunction Unit of Endocrinology Division, HC-Unicamp, according to its patients charts review. Radiiodine therapy (RIT) was indicated in 68% of the patients (171/251), of whom 80,1% (n=137) of these cases after RIT presented definitive control of the disease with one radiiodine administration. Therefore, the outcome of the patient related to the RIT failure was the thyroid volume according to the ultrasound and the scintigraphy uptake, and in addition, the thyroid volume was reported as a predictor factor for the failure to control hyperthyroidism.

### Key words:

*Hyperthyroidism, Graves Disease, Radioiodine Therapy.*

### Introduction

Graves' disease is the main cause of hyperthyroidism. This condition is associated to the presence of antibody against TSH-receptor (TRAb), which leads to an uncontrolled synthesis of T3 and T4 hormones and the thyroid hypertrophy. The therapy for Graves' disease involves antithyroid drugs, radiiodine therapy or thyroidectomy. Radioactive iodine (RIT) is the administration of <sup>131</sup>I to promote the thyroid cells progressive necrosis and consequently, the hyperthyroidism control. Our aims were to evaluate the outcome after RIT in patients with Graves' disease, and factors associated to the success of the treatment.

### Results and Discussion

This study evaluated 251 patients diagnosed with Graves' hyperthyroidism, in both genders, followed in the Thyroid Dysfunction Unit of Endocrinology Division, HC-Unicamp. According to the reviews, 78.09% were female and 73.88% were white. In 79.73% of the patients TrAb was elevated, as well as in 75.92% to antibodies anti-TPO, in 45.49% to antibodies anti-TG. Thyroid volume by ultrasound (US) and thyroid scintigraphy uptake before RIT were evaluated.

Radiiodine therapy was indicated in 68% (171/251) of the patients, of whom 80.1% (n = 137) of these cases presented definitive control with one radiiodine administration. The mean radioactive iodine dose was 14.05 mCi. Twenty patients needed 2 doses of radioactive iodine and 2 patients received 3 doses.

After RIT, hypothyroidism was observed in 72.5% of the cases, 7.6% evolve to euthyroidism and 19.9% maintained hyperthyroidism. On the other hand, 82.35% submitted to a second RIT developed hypothyroidism, and only 5,9% of the cases remained in hyperthyroidism.

Thus, it was demonstrated that higher thyroid volume (Mean Volume US (cm<sup>3</sup>): Eu/Hypothyroidism 28.7 ± 18.0 (N=114) vs Hyperthyroidism 45.4 ± 23.0 (N=30), p=0.0003) and thyroid uptake (Mean thyroid uptake: Eu/Hypothyroidism 11.0 ± 7.9 (N=133) vs Hyperthyroidism 18.7 ± 12.3 (N=32), p<0.0001) pre-RIT were associated to failure of RIT, however, only thyroid volume was reported

as a predictor factor to the failure of hyperthyroidism control (p=0.0076, OR = 1.042, CL95% 1.011-1.074).

### Conclusions

In conclusion, RIT was an effective treatment, allowing that 80% of the Graves' disease patients obtained the hyperthyroidism control with the administration of only one dose of <sup>131</sup>I. Additionally, higher thyroid volume was appointed as a predictor factor to the hyperthyroidism control failure, suggesting that thyroidectomy would be a better therapeutic option for patients with larger goiters.

Bahn, R. S. et al. Hyperthyroidism and other causes of thyrotoxicosis: management guidelines of the American Thyroid Association and American Association of Clinical Endocrinologists. *Thyroid* 21, 593–646 (2011).

Bartalena, L. Diagnosis and management of Graves' disease: a global overview. *Nat. Rev. Endocrinol.* 9, 724–734 (2013).

Burch, H. B., Cooper, D. S. Management of Graves Disease: A Review. *JAMA.* 2015;314(23)

De Leo, S., Lee, S. Y., Braverman, L. E. Hyperthyroidism. *Lancet.* 2016 March; [http://dx.doi.org/10.1016/S0140-6736\(16\)00278-6](http://dx.doi.org/10.1016/S0140-6736(16)00278-6)

Morshed, S. A., Latif, R. & Davies, T. F. Delineating the autoimmune mechanisms in Graves' disease. *Immunol. Res.* 54, 191–203 (2012).

Yang, J., Zhu, Y. J., Zhong, J. J., Zhang, J., Weng, W. W., Liu, Z. F., Xu, Q., Dong, M. J. Characteristics of Antithyroid Drug-Induced Agranulocytosis in Patients with Hyperthyroidism: A Retrospective Analysis of 114 Cases in a Single Institution in China Involving 9690 Patients Referred for Radioiodine Treatment Over 15 Years. *Thyroid.* 2016 May;26(5):627-33.