

Outcomes Following Radioactive Iodine Therapy (RAI) in Hyperthyroid Patients with Grave's Disease and Toxic Nodular Disease

Aljenaee K., McDonnell T., Cooke J., Phelan N., Pazderska A., Healy ML.
 Department of Endocrinology, St James's Hospital, Dublin, Ireland

Background:

RAI is a definitive treatment for hyperthyroidism, but administered doses vary between institutions. We utilize a fixed activity of RAI therapy for Grave's disease (GD) and toxic multinodular goiter (TMNG) while calculated activity for toxic adenoma (TA). We aimed to determine treatment outcomes at one year post RAI therapy.

Methods:

Thyroid function tests at 1 year post RAI therapy were reviewed retrospectively to determine and compare the outcome of 79 hyperthyroid patients divided in 3 etiological groups: 46 patients with GD treated with very low activity RAI (200MBq), TMNG treated with 400 MBq and TA treated with calculated activity between the period January 2012 and June 2017. Also the 24 hours thyroid isotope scan results were examined retrospectively to figure out if its related to the outcome.

Results:

48/79 patients had GD (60.8%), 16/79 patients had TMNG (20.2%) and 15/79 patients had TA (19%). Patients with GD were younger (median 46 years) compared to those with TMNG and TA (median 62 and 59 years respectively) and there were more female than males in both groups (85.5% female in GD, 93.7% in TMNG and 83.3% in TA).

	GD	MNG	TA
Number of patients	48	16	15
male	7	1	2
female	42	16	12
age (mean)	46	62	59

Table 1: Basic biographical data

At one year post-RAI, more patients with GD were rendered hypothyroid 28/48 compared to TMNG and TA (62.5% vs. 18.75% vs. 53.33%) and fewer patients with GD were rendered euthyroid (25% vs. 46.6% vs. 53.3%) or had persistent hyperthyroidism compared to those with TMNG/TA (12.5% vs. 0% vs. 0%).

12/28 patients with GD who developed hypothyroid had 24 hours isotope scan >60% and also all patients with 24 hours isotope scan >60% ended up with hypothyroid in GD and TMNG groups.

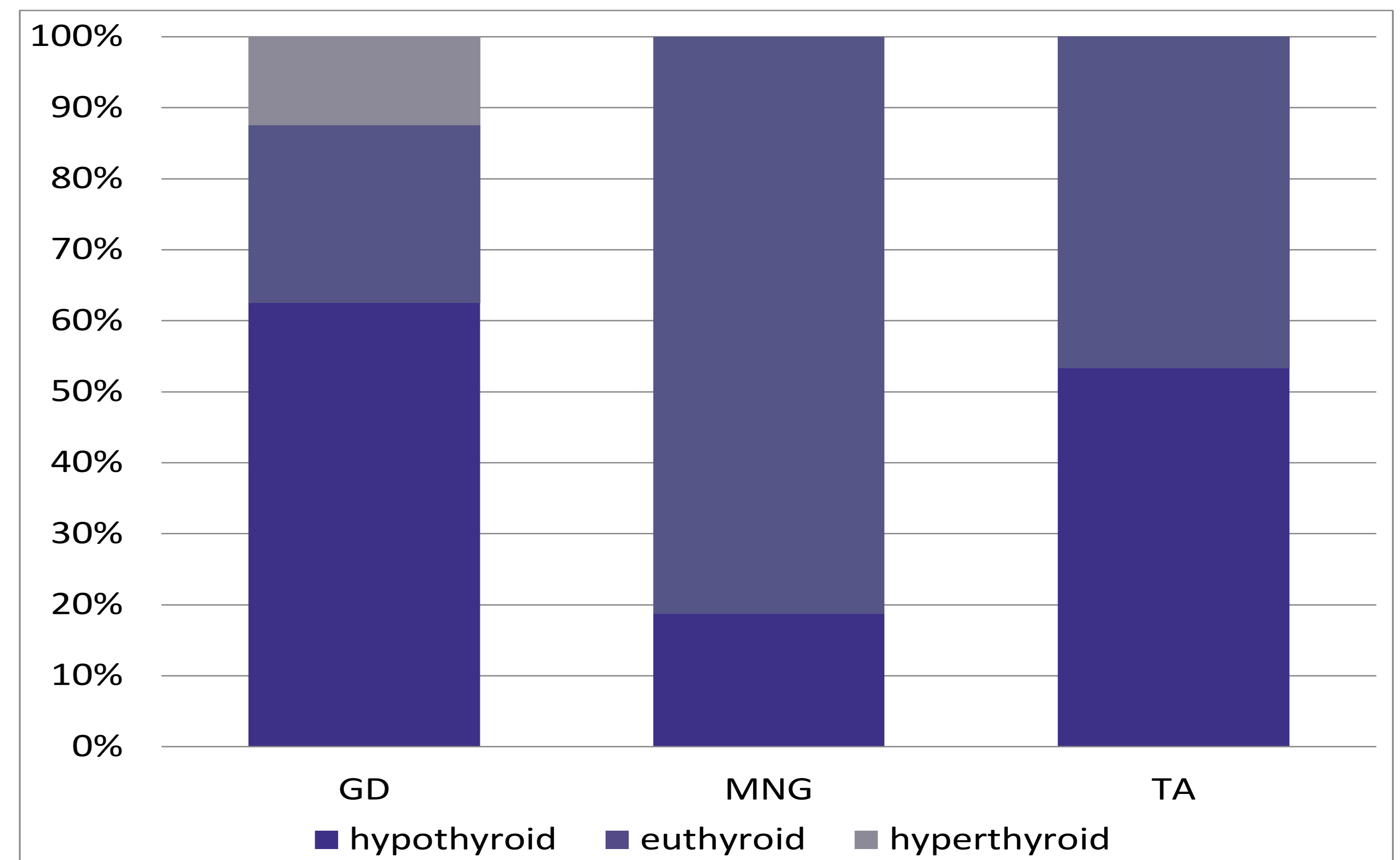


Figure 1: RAI outcome at 1 year

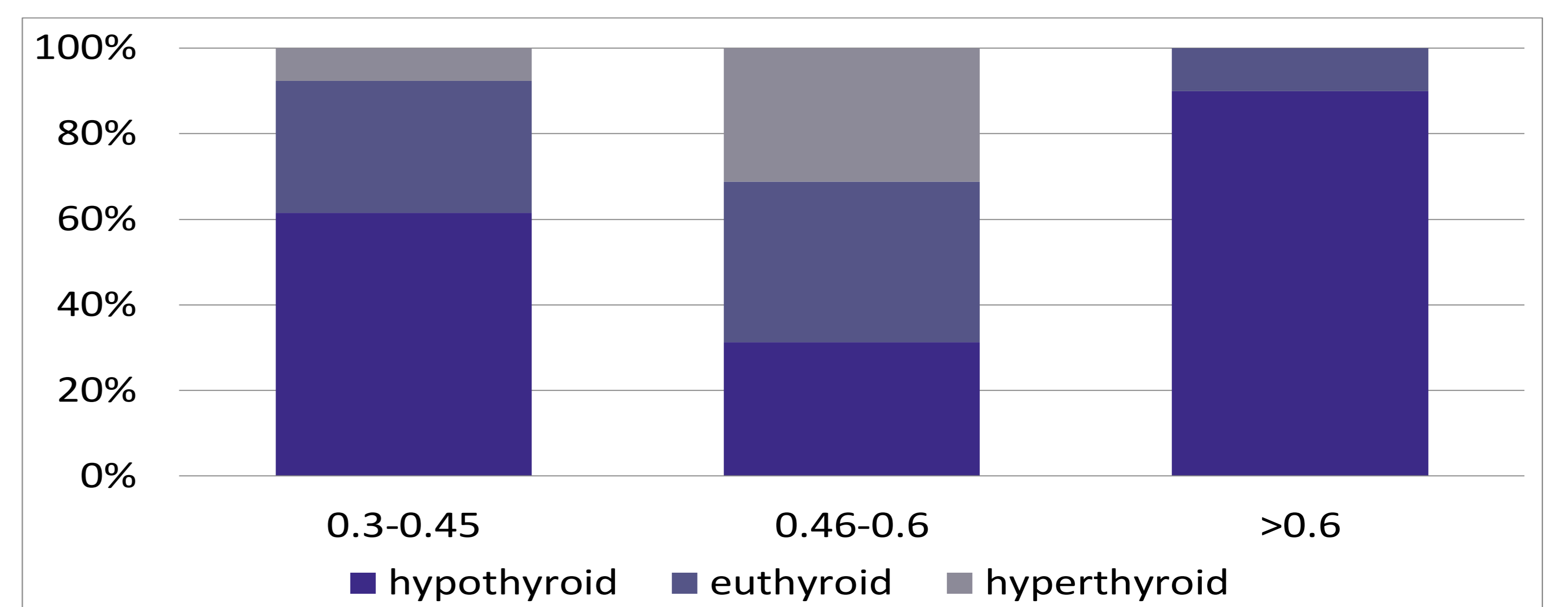


Figure 2: RAI outcome at 1 year based on 24 hours isotope scan.

Conclusion:

Very low activity of RAI (200 MBq) as treatment for GD which is below the recommended dose worldwide had a comparable outcome with cure rate 87.5%. Also we found that all patients with 24 isotope scan >60% in GD and TMNG group developed hypothyroid post RAI so a lower activity of RAI as treatment in those patients should be considered to reduce the risk of hypothyroid.

References:

- 1) Ross DS (2011) Radioiodine Therapy for Hyperthyroidism. *N Engl J Med* 364(6): 542-550.
- 2) Peters H, Fischer C, Bogner U, Reiners C, Schleusener H (1995) Radioiodine therapy of Graves' hyperthyroidism: standard vs. calculated 131 iodine activity. Results from a prospective, randomized, multicentre study. *Eur J Clin Invest* 25(3): 186-193.
- 3) Leslie WD, Ward L, Salamon EA, Ludwig S, Rowe RC, et al. (2003) A randomized comparison of radioiodine doses in Graves' hyperthyroidism. *J Clin Endocrinol Metab* 88(3): 978-983.