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## **Thyroid** **LBODP096**

### ***High Failure Rate Of Radioactive Iodine-131 (Rai) Therapy For The Treatment Of Grave's Disease And Toxic Multinodular Goiter In An Urban Municipal Hospital Clinic***

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**Background:** Radioactive iodine-131 (RAI) therapy is used to treat hyperthyroidism secondary to toxic multinodular goiter (TMNG) and Graves' Disease (GD). The treatment failure (TF) rate for RAI as reported in previous studies is 8-16% (1). Most patients respond to RAI with normalization of thyroid function tests and improvement of clinical symptoms within 4–8weeks. Previous studies also report higher TF rates amongst Black patients (2), but due to the low number of Blacks included in the study, identification of factors related to higher TF rates was difficult. **Study Purpose:** Determine treatment failure rates in patients who underwent RAI treatment for hyperthyroidism and characteristics related to Treatment Failure. **Methods:** This is a retrospective study that included patients treated with RAI for either TMNG or GD from 2014-2021 at an urban hospital. Patients with thyroid cancer, less than 18 years, or toxic adenoma were excluded. TF was defined as persistent hyperthyroidism 6 months after RAI. Remission was defined as euthyroid or hypothyroid state off of anti-thyroid hormones 6 months after RAI. Factors evaluated included age at RAI, gender, race, cause of hyperthyroidism, percentage uptake in pretreatment scan, peak Ft4 / Ft3 pre-treatment, RAI dose, and treatment with methimazole post RAI. Comparison of TF to those who achieved remission was performed using two-sample t-test or the Wilcoxon rank-sum test for continuous

variables and fisher tests for categorical variables.

**Results:** 66 patients were included in the analysis. Mean age was 49 years, majority female (76%), African (21%), African American (45%), GD (68%), TMNG (32%). 19 had TF (28.7%). There was no significant difference in characteristics between TF and remission groups prior to RAI. The RAI dose was not significantly different between the groups (21.0;21.1mCi). However, patients given methimazole shortly after RAI were at significantly higher risk of TF compared to patients who did not receive methimazole after RAI (64% vs 89%,  $p=0.04$ ). **Conclusion:** Previous studies report TF after RAI as high as 16%. Patients at our Hospital with TMNG or GD who underwent RAI had a higher TF rate of 28.7%. The high TF rate was not due to low RAI treatment dose. Randomized Controlled Trials have found 61%-86%(1) success with RAI dose ranging from 5.4 -15.7 mCi (1). In comparison, mean RAI dose at our hospital was high at 21.0. Patients prescribed methimazole within 4 weeks of RAI were more likely to have TF at 6 months. Based on the results of this study, we will initiate a change in protocol at our institution to hold methimazole for at least 4 weeks after RAI to see if this lowers the TF rates. References: 1. Ross, Douglas S., et al." Thyroid 26.10 (2016): 1343-1421.2. Mohamadien, N. R., & Sayed, M. H. (2020). American Journal of Nuclear Medicine and Molecular Imaging,10(5), 235.

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