

No Impact of Dietary Iodine Restriction in Short Term Development of Hypothyroidism Following Fixed Dose Radioactive Iodine Therapy for Graves Disease

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Abstract

Background

The increased incidence of autoimmune thyroid disease among genetically susceptible individuals with increasing dietary iodine has been demonstrated both epidemiologically and experimentally. The hypothyroidism that occurs in the first year following radioactive iodine therapy is probably related to the destructive effects of the radiation, while the subsequent occurrence of hypothyroidism is due to a combination of radiation injury and underlying and ongoing autoimmunity.

Objective

To study the outcomes at 6 months after fixed dose 131I therapy for Graves' disease (GD) with an iodine restricted diet.

Methods

Consecutive adult patients with GD planned for 131I therapy were randomized either to receive instructions regarding dietary iodine restriction or no advice prior to fixed dose (5 mCi) 131I administration. Thyroid functions and urine iodine indices were evaluated at 3rd & 6th months subsequently.

Results

Forty seven patients (13M & 34F) were assessed, 2 were excluded and 45 were randomized (Cases 24 & Controls 21) in the study. 39 patients completed the study and were included in the analysis. Baseline data was comparable. Median Urinary Iodine concentration was 115 and 273 µg/gm creat (p= 0.00) among cases and controls respectively. Outcomes at the 3rd month were as follows (cases & controls); Euthyroid (10&6; p=0.24), Hypothyroid (3&5; p=0.38) and Hyperthyroid (7&8; p=0.64). Outcomes at six months were as follows (cases & controls); Euthyroid (10&5; p=0.12), Hypothyroid (3&5; p=0.38) and Hyperthyroid (7&9; p=0.43). Of the hypothyroid patients 5 (cases 1 & controls 4; p = 0.13) required thyroxine replacement. 13 were considered cured among the cases compared to 10 among the cases (p=0.43).

Conclusions

There was no statistically significant difference in the outcome of patients with dietary iodine restriction following 131I therapy for Graves' disease but a trend towards better cure rates and decreased requirement for levothyroxine was observed.

Aims/Objectives

- To study the incidence of transient and permanent hypothyroidism following radioactive iodine 131I treatment among patients on dietary iodine restriction (cases) and without dietary iodine restriction (controls).

Results

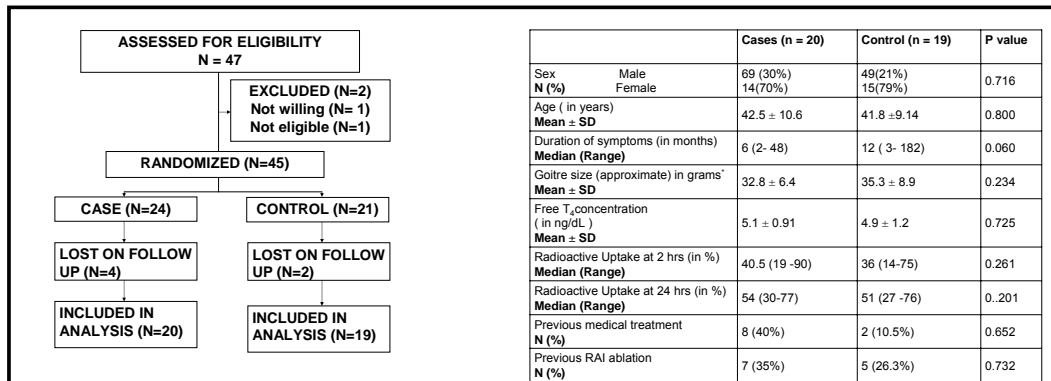
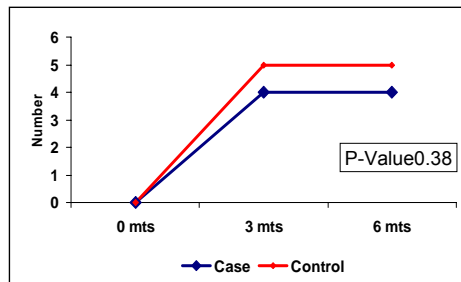


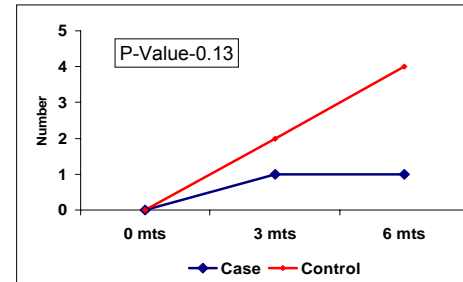
Figure 1: Flow diagram of the progress through the phases of this trial.



Graph 1: Incidence of hypothyroidism among cases and controls

	Cases (n = 20)	Control (n = 19)	P value
Sex			
Male	69 (30%)	49(21%)	0.716
Female	14(70%)	15(79%)	
Age (in years)			
Mean ± SD	42.5 ± 10.6	41.8 ±9.14	0.800
Duration of symptoms (in months)			
Median (Range)	6 (2- 48)	12 (3- 182)	0.060
Goitre size (approximate) in grams			
Mean ± SD	32.8 ± 6.4	35.3 ± 8.9	0.234
Free T ₄ concentration (in ng/dL)			
Mean ± SD	5.1 ± 0.91	4.9 ± 1.2	0.725
Radioactive Uptake at 2 hrs (in %)			
Median (Range)	40.5 (19 -90)	36 (14-75)	0.261
Radioactive Uptake at 24 hrs (in %)			
Median (Range)	54 (30-77)	51 (27 -76)	0.201
Previous medical treatment			
N (%)	8 (40%)	2 (10.5%)	0.652
Previous RAI ablation			
N (%)	7 (35%)	5 (26.3%)	0.732

Table 1: Baseline values



Graph 2: Development of primary hypothyroidism requiring levo-thyroxine in cases and control

Conclusion

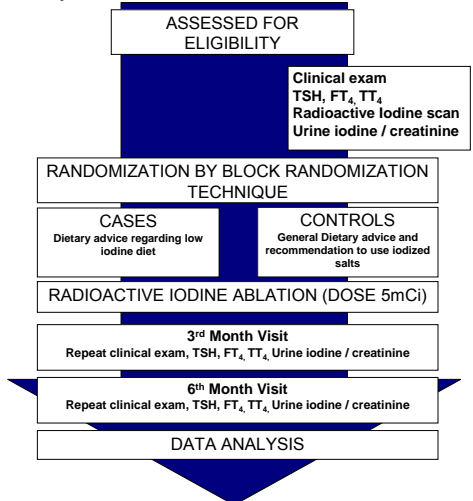
- There was no statistically significant difference in the development of overt primary hypothyroidism following Radioactive Iodine therapy for Grave's disease with dietary iodine restriction.
- Through a trend for better cure rates at 6 months was noted with dietary iodine restriction the difference was not statistically significant.

Methodology

Study subjects

Recruitment of the Cohort was done from the outpatient department of the Department of Endocrinology, Christian Medical College and Hospital, Vellore. The eligibility criteria are given below. The research proposal was informed to the Institutional Review Board and was ratified by the Committee prior to beginning of the study.

Study Protocol



Inclusion Criteria :

Adult patient (≥ 18 years) presenting with autoimmune thyroid disease and thyrotoxicosis who were willing to undergo radioactive 131I treatment for thyrotoxicosis.

Exclusion Criteria :

- Women in the reproductive age group planning on conception in the next 12 months
- Patient coming from over 300 kms distance to the centre.
- Patient with Cardiac decompensation.
- Patient with advanced Grave's Ophthalmopathy (Activity index over 4).
- Patients on Iodine containing drugs.

Acknowledgements

This study was funded by Fluid Research Grant #1173 of the Christian Medical College, Vellore.

Ms. Banu for coordinating the patient visits, correspondence and follow-up.

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