The utility of basal serum thyroglobulin measurement, using a highly sensitive immunoassay, in the follow up of patients treated for differentiated thyroid cancer.

N Glynn[1], AM Hannon[1], L Schneekloth[1], C De Buitléir[1], M Morrin[2], F Keeling[2], C Faul[3], M Leader[4], ADK Hill[5], W Tormey[6], CJ Thompson[1], D Smith[1], A Agha[1].

Departments of Endocrinology[1], Radiology[2], Radiation Oncology[3], Histopathology[4], Surgery[5] and Chemical Pathology[6], Beaumont Hospital & RCSI Medical School, Dublin

INTRODUCTION

Recurrent or residual disease can be detected in up to 20% of patients, following treatment for differentiated thyroid cancer (DTC).

TSH-stimulated serum thyroglobulin (Tg) is a sensitive marker for the detection of early recurrence or persistent disease.

However, stimulated Tg, using thyrotrophin or thyroid hormone withdrawal, is either costly or cumbersome for patients.

Recently, Tg assays with lower functional sensitivity have been developed which may reduce the need for stimulated Tg in selected patients.

AIM

Compare the performance of basal T4 suppressed Tg, with stimulated Tg measurement, in the follow up of patients treated for DTC.

PATIENTS & METHODS

We performed a retrospective review of patients treated for DTC at our institution between September 2011 and September 2014.

Patients with paired basal and stimulated Tg, who had concurrent neck imaging, were included for analysis.

Data recorded included patient demographics, surgical pathology and imaging results as well as biochemical parameters.

Tg was measured by the Beckman Access 11. This is a paramagnetic chemiluminescent immunoassay using a biotinylated mixture of 4 monoclonal Anti Tg Ab's. Functional sensitivity of 0.1ng/mL. Precision of the assay was 5.6% and 2.52% and serum concentration of 0.97µg/L and 4.42µg/L respectively.

A stimulated Tg >2ng/mL was considered significant. Patients with an elevated anti-thyroglobulin antibody titre were excluded from analysis.

RESULTS

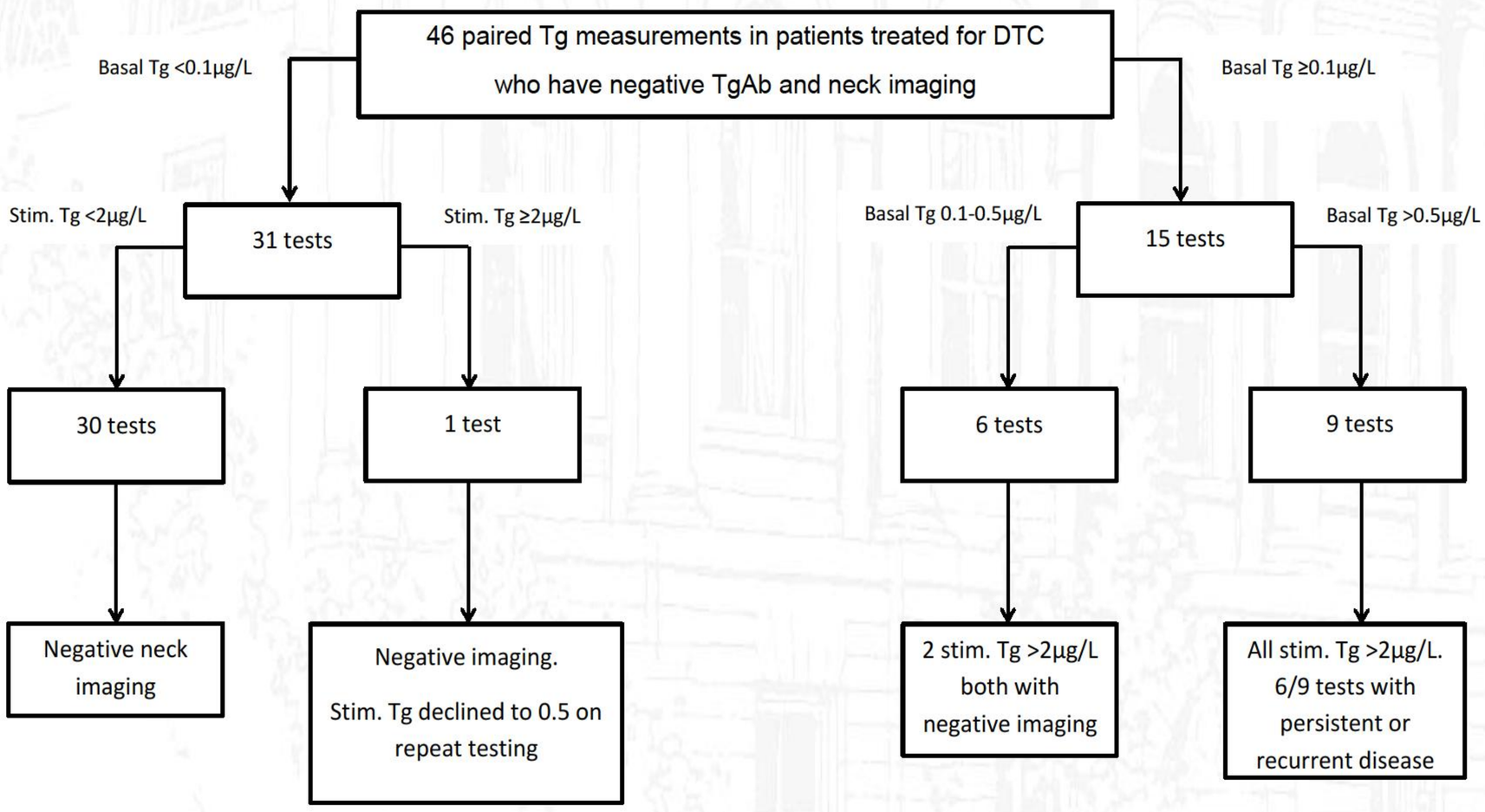

Figure 1. Flow diagram of patients treated for DTC who have paired basal and stimulated Tg during follow up.

- 46 stimulated Tg measurements were performed in 41 patients. All patients had simultaneous neck imaging with ultrasound.
- 34 patients (74%) were female. Mean age 44 years (range 25-72)
- Mean follow-up post Tg measurement 24 months.
- TNM stage
  - Stage 1 & 2 = 33 patients
  - Stage 3 & 4 = 8 patients
- Mean MACIS score 5.28
- Of the 31 tests in which the basal thyroglobulin was <0.1ng/mL, only one (3%) had a stimulated thyroglobulin >2ng/mL; none had radiological evidence of recurrent or residual disease.
- If the basal Tg was 0.1-0.5ng/mL, stimulated thyroglobulin was >2ng/mL in 33% of cases.

DISCUSSION

An undetectable basal Tg was highly predictive of a negative stimulated Tg. No patient with an undetectable basal Tg was found to have discordant neck imaging or further recurrence during follow up. However, follow-up was relatively short in this predominantly low-risk cohort.

Many international consensus guidelines recommend using stimulated thyroglobulin to detect residual or recurrent disease following treatment for DTC[1]. However, over the last decade 2nd generation Tg assays, which have a functional sensitivity ten fold greater than 1st generation assays, have been developed and validated in laboratories worldwide.

Our data is in keeping with emerging evidence, which suggests that basal Tg, measured with a second generation assay, has a similar predictive value as stimulated Tg in out ruling residual or recurrent DTC[2-3].

We conclude, that undetectable basal Tg measurement, using a highly sensitive Tg assay, together with negative neck imaging, are highly reassuring for remission following treatment for DTC.

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Nigel Glynn
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