

# Demographic Characteristics of Differentiated Thyroid Carcinoma Patients Treated with Radioiodine at INMAS, Suhrawardy - Initial Experience with first 35 Patients

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## ABSTRACT

**Background:** Differentiated thyroid carcinoma (DTC) is among the most curable cancers and relatively uncommon malignancy. These patients are treated by radio-iodine ablation (RAIA). In 1940s, radio-iodine ablation (RAIA) treatment for differentiated thyroid carcinoma (DTC) patients were first introduced in the world and in our country, it was in 1980. For treatment and lifelong follow up of DTC patients, we record all the medical documents at the thyroid division of Institute of Nuclear Medicine & Allied Sciences (INMAS), Suhrawardy.

**Objectives:** To evaluate the response of radioiodine treatment in DTC patients at INMAS, Suhrawardy and analyze the outcome of patients in a single institute.

**Patients and Methods:** This is a retrospective study. A total of 35 patients with DTC received RAI ablation therapy from august 2024 to December 2024 at INMAS, Suhrawardy. Data were obtained from the medical records of 35 DTC patients who were treated until December 2024 and all relevant data were available. Demographical, histopathological, surgical, radioiodine ablation doses of <sup>131</sup>I, serum biomarkers thyroglobulin (Tg), antithyroglobulin antibody (TgAb) and biochemical investigation data were analyzed systematically. Age, gender, tumor size, presence of local and distant metastases at presentation, extrathyroidal extension (ETE), disease recurrence, and cancer-specific survival were also evaluated. Risk stratifications for recurrence and staging were calculated for dosing of radioiodine. The single dose of radioiodine ranged from 30 mCi to 150 mCi was given according to the postsurgical risk assessment.

**Results:** The median age of DTC patients was 36 years, with a range of 21-68 years (39.40± 12.16 years), with the majority of patients falling within the 31-40 age group. The ratio of female to male was 3.375:1. Papillary thyroid carcinoma (PTC) 25(71%), follicular variant of thyroid carcinoma (FVPTC) 8(23%) and follicular thyroid carcinoma (FTC) 02(6%) was diagnosed in our institute. Excellent response (ER) was observed by a single dose of radioiodine ablation in 35(100%).

**Conclusion:** As a new institute we observed that, significant number

of DTC patients was increased in day by day. ER was noted in 100% with a single dose of radioiodine still now.

**Keywords:** Differentiated thyroid carcinoma, Radioiodine ablation therapy, excellent response.

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## INTRODUCTION

Most successful treatment option for differentiated thyroid carcinoma (DTC) is thyroidectomy followed by radioiodine ablation. Radioiodine (RAI) treatment was firstly introduced in the USA at the year of 1940 (1, 2). In our country RAI ablation was first introduced for DTC in the National Institute of Nuclear Medicine & Allied Sciences (NINMAS) in 1980 (3).

Sometimes the protocol of treatment differs between institutes, hospitals and among countries as management protocols have an array of minor differences. So, the management of DTC patients are unique example of personalized medicine. So far, radioactive iodine therapy and follow-up have been continuing over 05 months at our institute.

## PATIENTS AND METHODS

From August 2024 to December 2024 a total of 35 patients with DTC received RAI ablation therapy at Institute of Nuclear Medicine & Allied Sciences (INMAS), Suhrawardy after thyroidectomy. Retrospective data was obtained from the medical records of 35 patients who received RAI ablation (RAIA) during this time. Among this 35 patients the number of female patients is 27 and the number of male patients is 08 (Figure-1).

Patients was evaluated on the basis of 'age, sex, histopathological diagnosis, stimulated risk stratification for recurrence and staging was calculated before therapy by physicians according to guidelines of American Joint Committee for Cancer (AJCC), American Thyroid Association (ATA) 2015 guidelines (4), operation notes, and histopathological reports.

About 30 m Ci to 100 m Ci was given in low-risk and intermediate-risk groups of patients. ATA 2015 guideline recommendations were not to give RAIA to low-risk DTC patients. Previously, a good number of patients of the low-risk group of DTC received RAIA in NINMAS (5), that's why nowadays, we discuss the recommendations about RAIA in low-risk DTC patients and we applied it in our institute. In some patients, risk stratification could not be done clearly due to lack of detail information of operation notes and histopathological reports. Still, some patients of low-risk group are given low dose RAIA upon patients' options. DTC with lymph nodes and lungs metastases received 150 m Ci.

Thereafter, patients were kept on levothyroxine at TSH suppressive dose after 48 hours of RAIA.

Baseline post-therapy whole-body scan (RxWBS) was usually done on the 5th day of radioiodine ablation to observe the presence of <sup>131</sup>I avid thyroid tissue remnants in

thyroid bed and presence of <sup>131</sup>I avid metastatic lesions in extrathyroidal location. All recorded data were collected in excel sheet and analyzed. According to the guideline in the first year, each patient was checked three times for clinical evaluation, FT4, TSH, Tg, TgAb, calcium, and US of the neck wherever indicated. After one year of RAIA, a diagnostic whole-body scan by <sup>131</sup>I (DxWBS) was performed. In our institute near about 40-50% patients of total patients have completed their first follow-up till now. The Thyroid Division of INMAS, Suhrawardy has taken on the responsibility of lifelong follow-up for all the DTC patients who received RAIA here and who are referred to us.

## RESULTS

As a new institute, our thyroid division activity started from August 2024 and till December 2024 total 35 patients were treated by radio-iodine ablation (RAIA). Most of the patients were female 27 (77%) and male 08 (23%) in this study and the female to male ratio is 3.375:1 (Figure-1).

The age range of DTC patients was 21-68 years, and the mean age was 39.40±12.16 years and a median of 36 years. Most of the patients presented within 31–40 years, and subsequently, more patients were noted in 20–30 years. Only few patients above 50 years received radioiodine (Figure 2).

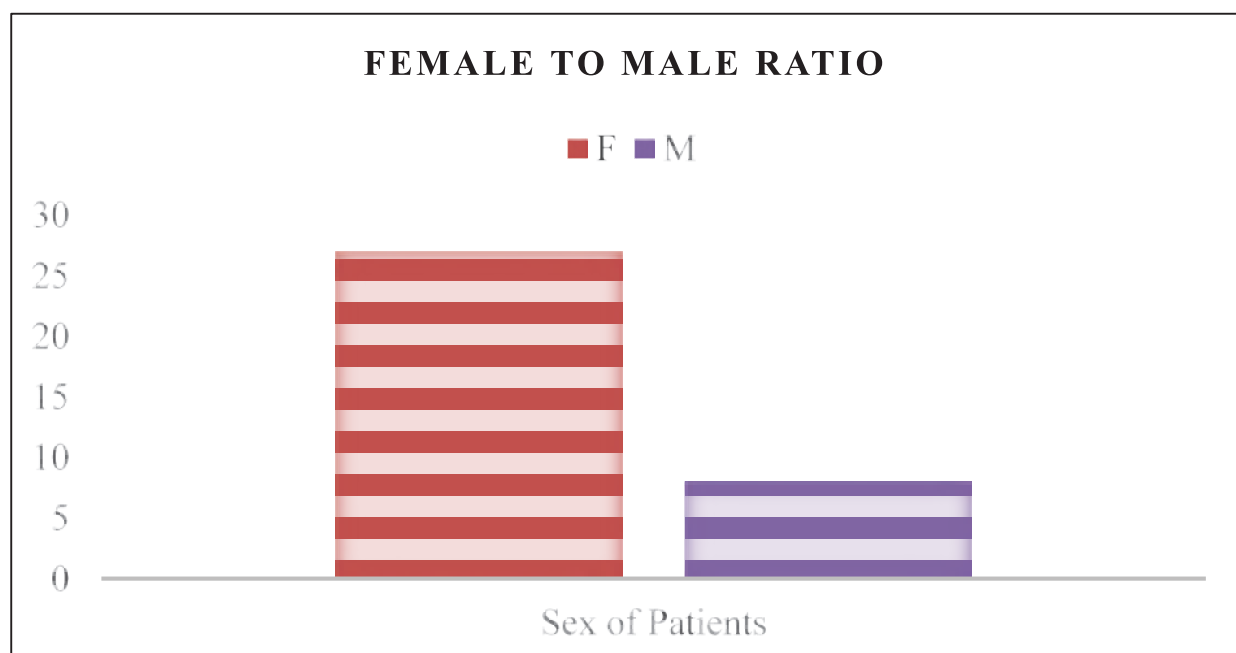
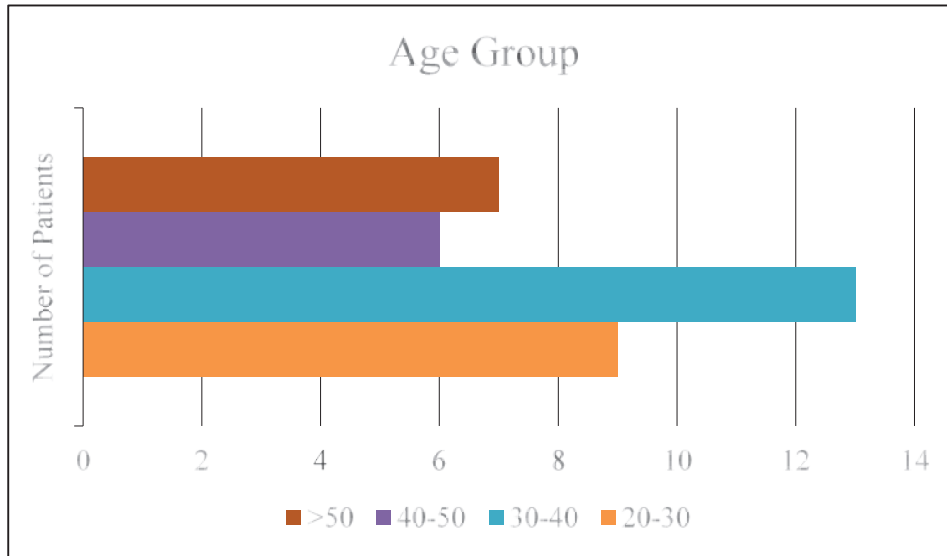


Figure 1: Gender ratio of differentiated thyroid carcinoma patients treated last five months

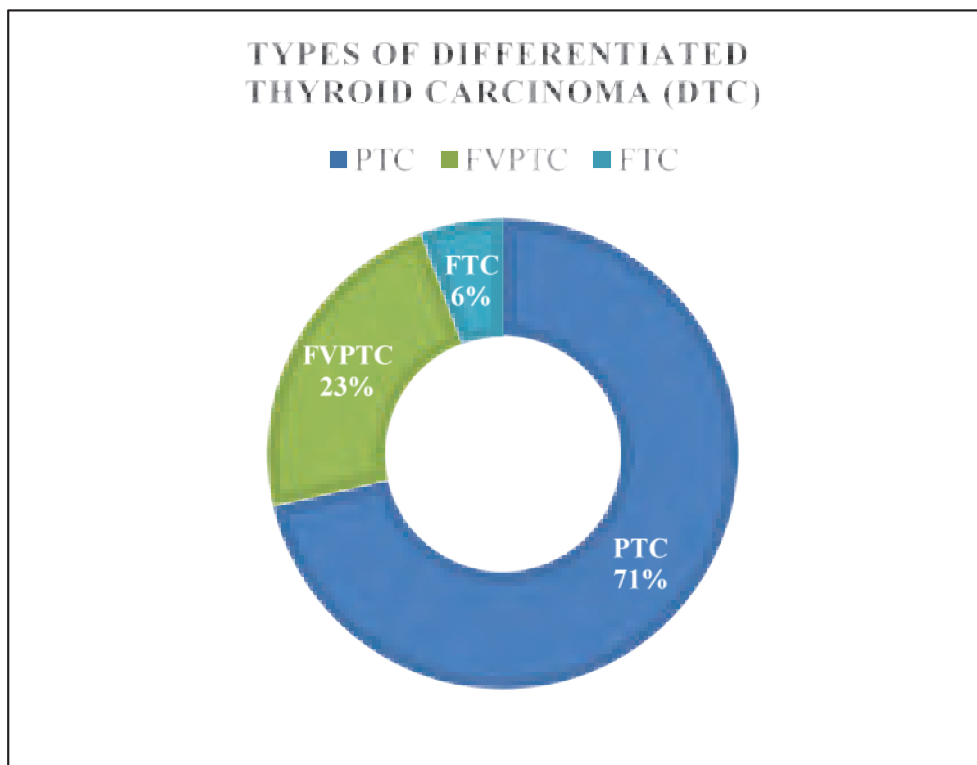


**Figure 2: Bar chart showing Age Group of patients treated in Thyroid division at INMAS, Suhrawardy**

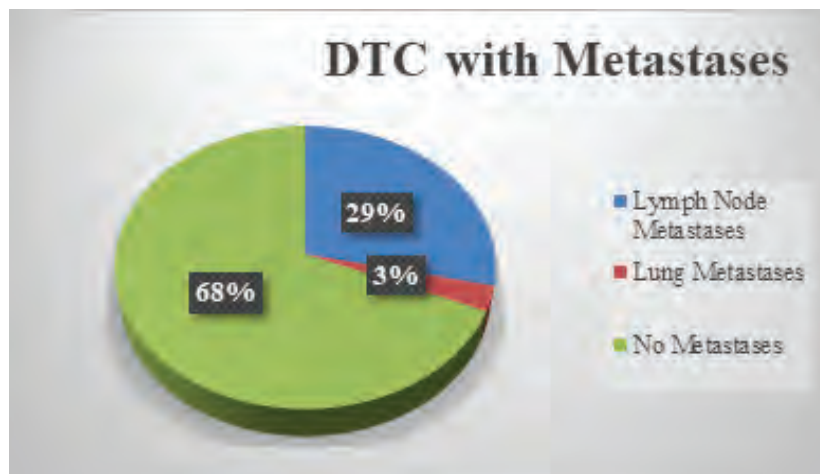
Histopathological analysis showed papillary thyroid carcinoma (PTC), follicular variant papillary thyroid carcinoma (FVPTC), and follicular thyroid carcinoma (FTC) were the three main categories evaluated in postsurgical tissue, and the percentage of these three categories was PTC (25) 71%, FVPTC (08), 08(23%)

and FTC 02(6%) which was diagnosed in our institute (Figure 3).

Histopathological reports provided information about metastasis. In this institute, 10 patients had lymph node metastasis, 01 lung metastasis and 01 had extrathyroidal extension (Figure 4).



**Figure 3:Types of Differentiated Thyroid Carcinoma (DTC) patients attending thyroid division of INMAS, Suhrawardy**



**Figure 4: Differentiated Thyroid Carcinoma (DTC) with Metastases.**

The study found that lymph node and distant metastasis are more prevalent in the 31-40 age group, with 02 patients showing diffuse hepatic uptake and good response to radioiodine treatment.

#### DISCUSSION

The number of DTC patients increased significantly day by day, and this might be a result of greater disease awareness and availability of imaging facilities, especially ultrasound imaging, and treatment options even in developing countries like ours. In developed countries the incidence of thyroid cancer has substantially increased over the past 30 years, and so this increase has been associated with overdiagnosis, screening, and possibly advances in imaging technologies (6).

A higher risk of FTC has been linked to both iodine deficiency and endemic goiter. A higher incidence of PTC and a reduced incidence of FTC have both been associated with iodine supplementation (7). One thing we have noticed in our study is a decline in the number of FTC referrals at this institute. It might be because Bangladesh's iodine deficiency has decreased after a national salt iodination program was implemented in 1989 (8, 9).

Among all malignancies, only the stage of thyroid cancer is influenced by age (10). In this study, the majority of DTC patients were between the ages of 31-40 years, with few patients older than 60 years.

Primary thyroid carcinoma advanced rapidly in young patients than in middle-aged or elderly ones. The researchers found that clinical PTC recurrence is more common in young people (11). Although the patient's

disease specific survival (DSS) may be impacted by their age at diagnosis of DTC (12).

We observed in this study that female predominance was more than male and the ratio was female: male 3.375:1 and there was no statistically significant difference in outcome of RAI ablated DTC patients in respect of gender. Other studies also described the similar findings. Female to male ratio: 3.5:1 was also found by Nilubol N et al (2013) (13), but they observed that men, regardless of age, had lower DSS than women. According to the authors, DTC is 2-4 times more common in females than in males. For PTC, the average age of diagnosis is 40-45 years old, while for FTC it was 50-55 years old. They are extremely uncommon among children (14). In PTC patients, male sex was also associated with statistically significant poor prognosis (15). Other authors observed that male sex was not an independent prognostic predictor of DTC recurrence, according to their multivariate analysis (16).

In the presented study, ER was observed in 100% DTC patients after total thyroidectomy and RAI ablation.

#### CONCLUSION

As a new institute we observed that, significantly increasing number of patients of DTC were treated by radioiodine in last 5 months at INMAS, Suhrawardy. DTC patients presented with a median age of 36 years and female predominance (F:M-3.375:1). Excellent response was observed in 100% of DTC patients by giving single dose of radioiodine.

#### CONFLICT OF INTEREST

The authors declare that there is no conflict of interests regarding the publication of this paper.

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