P18

A Preliminary National Study on Thyroid Disease: An Investigation into the Quality of Life of Hypothyroid Patients, to Highlight the Importance of Proper Diagnosis and Treatment

Nalini K. Singh, Varma H. Rambaran

University of Trinidad and Tobago (UTT)

Corresponding Author: Nalini K. Singh

Email: nalini.singh@utt.edu.tt

Introduction

The endocrine system is a collection of specific glands in the human body, which secretes hormones that are transported throughout the body to control factors such as metabolism, growth and sexual development. In the human body, there are several major glands that constitute this system, however the three glands (highlighted in **Figure 1** below) that are the main focus of this study are:

- **Hypothalamus** – It is responsible for releasing a tripeptide hormone called thyrotropin releasing hormone (TRH) to the pituitary gland to stimulate the production and release of the thyroid stimulating hormone (TSH)
- **Pituitary Gland** - This gland is separated into the anterior lobe and the posterior lobe. However, it is the anterior lobe that is responsible for the production of TSH, amongst other hormones.
- **Thyroid Gland** - It contains numerous vesicles that produce the thyroid hormones thyroxine (T4) and triiodothyronine (T3), which are essential for the regulation of metabolism and growth, but also affect many more functions in the body.

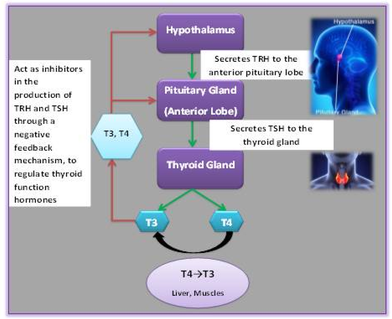

Figure 1: Hypothalamic-Pituitary-Thyroid Axis Diagram

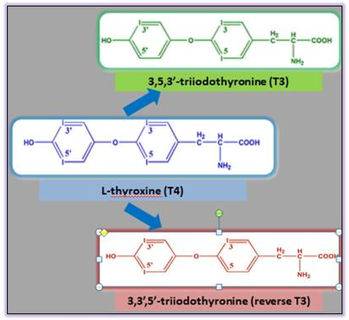

Figure 2: Conversion of L-thyroxine (T4) to Triiodothyronine (T3)

When the T4-T3 conversion is affected, there are errors in the feedback mechanism, which would result in either a deficiency or an excess of thyroid hormones.

Thyroid diseases often require long-term treatment and control, and many different target organ systems are affected.[1] Functional thyroid disorders are sometimes undiagnosed, which can affect the everyday life of such persons. Some reasons for undiagnosed thyroid diseases include:

- Failure to administer a full thyroid function blood test; relying on TSH levels only
- Use of outdated TSH lab ranges
- The relatively high cost of continuously testing thyroid function hormone levels.

Internationally, Endocrine Disorders are ranked 26th in the top causes of death, while nationally it has the ranking of 14.[2] Most thyroid diseases affect the metabolism and thus all the psychological and physiological processes in the body.[3]

The purpose of the overarching study is:

- To create a baseline using data from hypothyroid patients
- To assess statistical data and identify those who are more prone to hypothyroidism
- To investigate why different medical labs have different ranges for thyroid function levels in Trinidad and Tobago
- To bring more awareness to hypothyroidism, specifically to express the importance of monitoring thyroid levels

However, the purpose of the pilot study was to specifically investigate a sample population of varying demographics to determine incidence and prevalence of Endocrine and Metabolic disorders nationally.

1. Watt T, Cramon P, Hegedüs L, Bjorner JB, Bonnema SJ, Rasmussen ÅK, Feldt-Rasmussen U, Groenvold M. The thyroid-related quality of life measure ThyPRO has good responsiveness and ability to detect relevant treatment effects. J Clin Endocrinol Metab [Internet]. 2014 [cited 2019 Sep 10]; 99(10):3708–3717. Available from: https://www.researchgate.net/publication/263778066 DOI: 10.1210/jc.2014-1322
2. Health Profile Trinidad and Tobago. World Life Expectancy [Internet]. 2017 [cited 2019 Sep 19]; Available from: https://www.worldlifeexpectancy.com/country-health-profile/trinidad-tobago
3. Nexo MA, Hegedüs L, Feldt-Rasmussen U, Watt T, Rasmussen ÅK, Bjorner JB, Bonnema SJ. Thyroid-specific questions on work ability showed known-groups validity among Danes with thyroid diseases. Qual Life Res [Internet]. 2014 [cited 2019 Sep 10]; 24:1615–1627. Available from: link.springer.com/article/10.1007/s11136-014-0896-0 DOI: 10.1007/s11136-014-0896-0

Methods

1. **Administering of Pilot Study**
   This was administered to the UTT Staff/Student population and was geared towards a final methodology for determining incidence and prevalence of Endocrine and Metabolic disorders within Trinidad and Tobago.

2. **Analysis of Data of Pilot Study using Microsoft Excel**
   This was done as a representation of a sample population that would aid in the direction of a future larger-scaled study.

Moving forward with this research, the methodology will involve the administering of the ThyPRO Survey (Thyroid-Related Quality of Life survey model) to Hypothyroid Patients in the Public Health Sector.

Results

From the 982 completed surveys, 108 persons identified themselves as having an Endocrine Disorder. From **Figures 3 and 4**, it can be seen that the sample population consisted of persons throughout the country, and of varying age ranges.

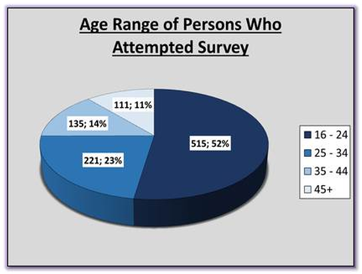

Figure 3: Age Comparison of Sample Population

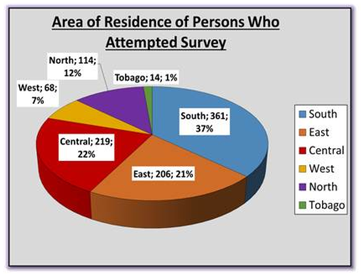

Figure 4: Location Comparison of Sample Population

In **Figures 5 and 6**, it can be seen that from the surveyed population who identified themselves as having an endocrine disorder, 75% were women. However, from 982 persons investigated, only 15% of women identified themselves as having an endocrine disorder, and 6% of men. Based on these findings, the study can be directed to either further investigate the female population alone, or a comparison of both male and female.

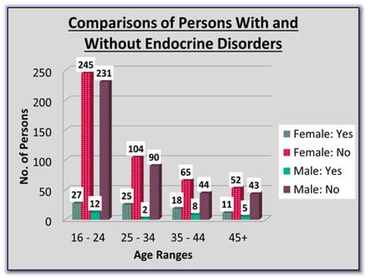

Figure 5: Endocrine Disorder Comparison

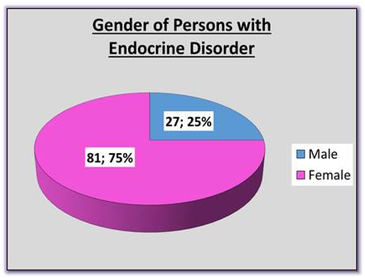

Figure 6: Gender of Population with Endocrine Disorder

As observed in **Figure 7** below, Obesity and Polycystic Ovarian Syndrome (PCOS) were recognized as the two most common endocrine disorders. Noteworthy is the fact that the percentages do not total 100%. This is due to persons identifying more than one disorder in some cases.

In **Figure 8** it can be seen that the majority of persons with an endocrine disorder only take blood tests once annually. It should also be noted that under "Other", most of these persons never took a blood test for their disorder, they take a blood test every couple years, or they take a blood test when they or their doctors deem it necessary.

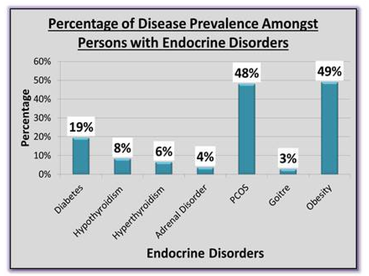

Figure 7: Disease Prevalence Amongst Persons with Endocrine Disorders

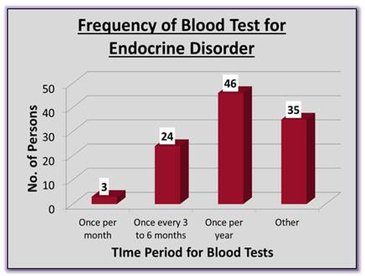

Figure 8: Frequency of Blood Tests for Endocrine Disorder

Conclusions

Hypothyroidism is an endocrine disorder that affects more females than males with the ratio being approximately 3:1, and is sometimes accompanied with another endocrine disorder, which usually has similar symptoms. Hormonal blood testing is a way to assess the presence and extent of hypothyroidism, but as the findings highlight in most cases it is conducted annually, a couple years apart, or in some cases not at all.

The findings also confirmed the need for the ThyPRO survey, which will facilitate a grater description and understanding of the Trinidad and Tobago hypothyroid population. This will provide varied analyses and comparisons to better understand the impact and implications for improved clinical outcomes. For example:

- To investigate the quality of life of both male and female hypothyroid populations for comparison.