

## Overview of Thyroid Status of Patients Seeking Care in Asokoro District Hospital Abuja.

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**ABSTRACT:-** The thyroid gland which is a butterfly shaped endocrine gland situated on the front of the neck is involve in the regulation and production of hormones such as triiodothyronine (T3), tetraiodothyronine (T4) and thyroid stimulating hormone. It was observed that the rate of request of thyroid test test was increased, hence the need to carry out this overview of the thyroid status of the patients seeking care in Asokoro district hospital in Abuja metropolis. This study was a retrospective study of six months taking into account the serum measurement of T3, T4 and TSH. Blood samples collected from one hundred and sixty (n=160) were analyzsd using ELISA method. The results obtained for T3, T4 and TSH expressed in Mean  $\pm$  SEM are  $1.5 \pm 0.11$ ,  $7.1 \pm 0.29$  and  $1.7 \pm 0.25$  respectively. A prevalence of 8.8% was observed to have abnormal thyroid results. Patients in the age range of 40 -59 yrs had the highest abnormal thyroid result (11.5%) which may indicate decrease thyroid function with age.

### Introduction:

The thyroid is about 2-inches long and is located immediately below the larynx on each sides of and anterior to the trachea. It lies in front of the throat below the prominence of thyroid cartilage sometimes called the Adam's apple. It has two sides called lobes that lie on either side of the windpipe, and is usually connected by a strip of thyroid tissue known as an Isthmus. It is one of the largest of the endocrine glands, normally weighing 15-20 grams in adults (Sapin & Schlienger, 2003). These lobes are themselves made up of many small lobules joined together with connective tissue. These make up the glands that produce, store and release hormones into the bloodstream so the hormones can reach the body's cells. About 93% of the metabolically active hormones secreted by the thyroid gland is thyroxine (T4) and 7% triiodothyronine(T3). However, almost all the

thyroxine is eventually converted to triiodothyronine in the tissue so that both are functionally important. The functions of these 2 hormones are quantitatively the same, but they differ in rapidity and intensity of action (National Library of Medicine, 2016). T3 is about four times as potent as T4 but it is present in the blood in much smaller quantities and persists for a much shorter time than does T4. The thyroid gland is composed of large numbers of closed follicles filled with a secretory substance called colloidal and lined with cuboidal epithelial cells that secrete into the interior of the follicles. The major constituent of colloid is the large glucoprotein thyroglobulin which contains the thyroid hormones within its module. The thyroid gland has a blood flow about five times the weight of the gland each minute which is a blood supply as great as that of

any other area of the body. To form normal quantities of T4, about 50mg of ingested iodine (which can easily be gotten from iodized common table salt) is needed. Iodides ingested orally are absorbed from the gastrointestinal tract into the blood. Most of them are rapidly excreted by the kidneys, but only after about 1/5th are selectively removed from the circulating blood by the cells of the thyroid gland and used for synthesis of the thyroid hormones.

Both of these hormones have the profound effect of increasing the metabolic rate of the body, regulates growth and development. It's important that their levels are neither too high nor too low. Thyroid secretion is controlled primarily by TSH secreted by the anterior pituitary gland which acts as sort of a hormonal thermostat (Shin, Lee & Kim). Thyroid hormones T3 and T4 control the body's metabolism by signalling the cells to convert oxygen and calories into energy. Every cell in the body depends on these hormones (Sapin & Schlienger, 2003). About 80% of the thyroid hormone in the body is T4.T3 is less common but far more potent form of the hormone .T3 is refined from T4 in the thyroid, liver and pituitary gland (National Library of Medicine, 2016).

The thyroid also produces a third hormone called Calcitonin. This seems to be involved in calcium and bone metabolism in some animals but the exact biological role in humans is not yet fully understood (John Hopkins Medicine Health Library, 2016). Physiologic functions of the thyroid hormones are: Increases the transcription of large numbers of genes by activating nuclear transcription of protein enzymes, structural and transport proteins, they activate nuclear receptors which in turn initiate transcription process, they increase cellular metabolic activity by increasing the number and activity of mitochondria and active transport of ions through cell membranes, thyroid hormones stimulates fat and carbohydrate metabolism and increases vitamins requirements in the body, it increases blood flow and cardiac output which leads to increased heart rate and strength, respiration and gastrointestinal motility, increased thyroid hormone increases the rate of secretion of most other endocrine glands also the need of the tissues for the hormones e.g increased T4 secretion leads to increased glucose metabolism therefore causes a corresponding need for increased insulin secretion by the pancreas, approximately normal secretion of thyroid

hormone causes normal sexual functions both in men and women, thyroid hormones are crucially required for the proper functioning and normal physiological growth of kidney, therefore thyroid disorders have a direct adverse effects on the kidney behavior (U.S. National Library of Medicine, 2016).

**Materials and methods:**

**Study Area:** This study was carried out in the metropolitan city of Abuja, FCT, located in the North central geopolitical zone of Nigeria. Abuja which was founded in 1828 has a coordinate of 9°4’N 7°29’E and a land mass of 713km². It is the capital city of the Federal Republic of Nigeria and has a population of 979,876 according to the 2006 National population census (Anang, 2011). It is bound to the south by Kogi and bound to the North West and North East by Niger and Nassarawa states respectively.

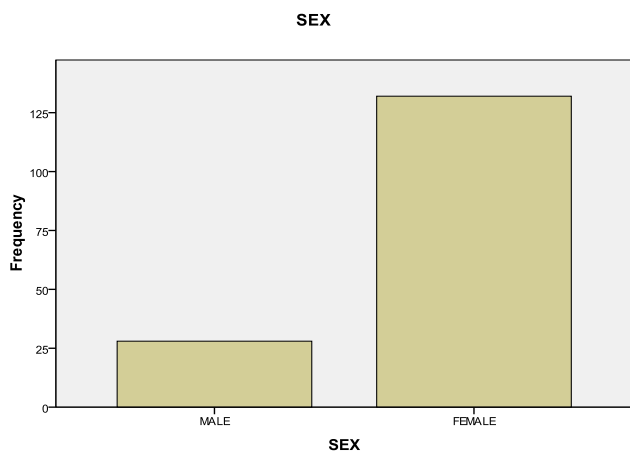
**Study Population/Subjects:** A total of 160 samples were collected for the period under review (November, 2017 – April, 2018). The age range was from 5 – 60 years and above. It was a retrospective study. **Biochemical Measurements:** T3, T4 and TSH were analyzed using Enzyme Linked Immunosorbent Assay (ELISA) technique. **Statistical Analysis** Statistical Analysis including Descriptive Statistics was carried out using the Statistical Package for Social Sciences (SPSS). Values were expressed as Mean ± Standard Error of the Mean.

**Results and discussion:**

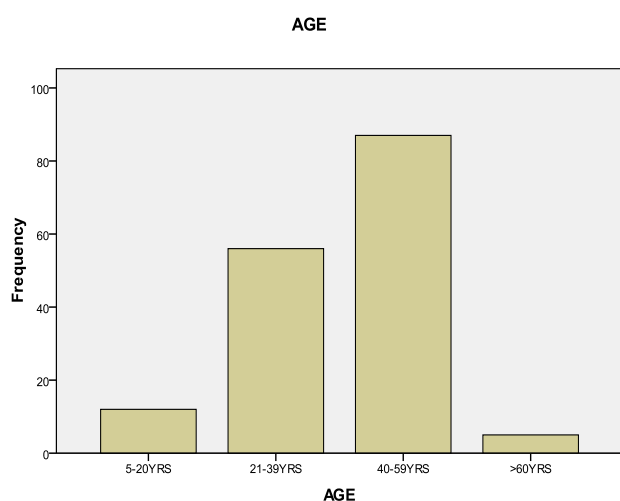
The results obtained in this study are shown in the tables and figures below.

**Table 1: Frequency Count and Percent of Gender of the Study Population**

	Frequency	Percent
MALE	28	17.5
FEMALE	132	82.5
Total	160	100.0



**Figure 1: Bar Chart of Gender of the Study Population**



**Figure 2: Bar Chart of Age of the Study Population**

**Table 2: Mean + SEM of TFT Results of the Study Population.**

Age Range	Frequency / Percentage	Mean ± SEM			% of Abnormal Thyroid Results
		T3	T4	TSH	
5 – 20yrs	12 (7.5%)	1.2 ± 0.14	6.8 ± 0.71	1.9 ± 0.34	0%
21 – 39yrs	56 (35.0%)	1.4 ± 0.19	7.5 ± 0.46	1.6 ± 0.26	7.1%
40 – 59yrs	87 (54.4%)	1.6 ± 0.18	6.9 ± 0.41	1.8 ± 0.41	11.5%
>60yrs	5 (3.1%)	0.9 ± 0.06	5.9 ± 1.05	1.1 ± 0.24	0%

Thyroid test typically involves having blood drawn and analyzed in a medical laboratory, where the hormone levels are measured. Thyroid function test include TSH, it is the most reliable and the first test to be performed. High levels of TSH means that pituitary gland is working overtime while low TSH means that the pituitary senses abnormally high levels of thyroid hormone thereby restricting TSH production. The normal test range is between 0.4-6.2 µIU/ml (US National Library of Medicine, 2016). T4 test, checks the amount of thyroid hormone in the blood. Overactive thyroid will show high T4 while underactive shows low T4. Some conditions and medications may affect results. Both pregnancy and birth control pills will cause T4 levels to spike but do not necessarily indicate hyperthyroidism. Asthma, arthritis and skin medications may cause lower levels without indicating hypothyroidism. The normal test range is between 4.4-10.8ug/dl (US National Library of Medicine, 2016). T3 test may seem redundant; however it's important to check both. Some cases of hyperthyroidism may show normal T4 levels but high T3. The normal test range is between 0.8-2.0ng/ml (US National Library of Medicine, 2016). A total of 160 samples from the period of six months shows that the result expressed in Mean ± SEM of T3, T4 and TSH as 1.5 ± 0.11, 7.1 ± 0.29 and 1.7 ± 0.25 with 8.8% of the entire population having abnormal thyroid results. A breakdown of the specific age group as shown above indicate that 40 – 59 years account for the highest class size with abnormal thyroid results. From Table 1 and Figure 1, 82.5% (132) of the study population were women while the remaining 17.5% (28) were men. This shows that women often take their health status more seriously than their male counterpart. From the study also, as shown in Table 2, the study population in the age range of 40 – 59y years had more abnormal thyroid results accounting for 11.5% followed by 21 – 39 years accounting for 7.1%.

**Conclusion:**

Thyroid disease is more in the age range of 21 – 59 years which are the active years in a human life. A prevalence of 8.8% was established from this study for abnormal thyroid results among patients accessing care in Asokoro District Hospital, Abuja. Therefore diet should be fortified with essential nutrients like iodine and selenium. This mineral is prevalent in seawater and best sources of iodine are seafood and seaweed. It can also be gotten from

iodized table salt used in homes. It is important for expectant mothers to ensure they get proper thyroid nutrition. Other nutrients include iron and zinc, which are also both important trace elements for thyroid health. Iron helps thyroid process iodine.

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