



## SCREENING OF CLINICAL PRESENTATIONS AND COMPLICATIONS OF HYPOTHYROIDISM

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### ABSTRACT

**Objective:** Hypothyroidism has a broad clinical range of subclinical to severe diseases along with various complications, like Myxedema, Obesity, Birth defects, Mental Health Issues. The present study was aimed to evaluate the prevalence of hypothyroidism complications and its clinical presentations related to gender wise. **Methods:** The prospective study was conducted on 1000 subjects in Santhiram General Hospital during July 2017- Dec 2017. The subjects with (T3 = <80-220ng/dl), (T4 = <4.5–11.5µg/ dl) & (TSH = >5mIU/L) were selected. The data were analyzed using SPSS version 11.5, software and chi-square tests, p (<0.05) was considered significant. **Results:** Out of 304 patients, hypothyroidism complications were more prevalent in Obesity n= 125 (41.36%). In distribution of clinical presentation more prevalence was observed in weight gain n= 29(9.6%). Females (41.9%) were more prevalent than Males (36.4%) related to complications. Females (9.7%) were more prevalent than Males (9.1%), related to clinical presentations. **Conclusion:** Our study demonstrates that females are more prone to the complications and clinical presentations like Obesity and weight gain respectively. Hence it is necessary to measure the TSH levels in females.

**KEYWORDS:** Prevalence, Hypothyroidism, Clinical Presentation.

### INTRODUCTION

Hypothyroidism, or underactive thyroid, develops when the thyroid gland fails to produce or secrete as much thyroxin (T<sub>4</sub>) as the body needs. Because T<sub>4</sub> regulates such essential functions as heart rate, digestion, physical growth, and mental development, an insufficient supply of this hormone can slow life- sustaining processes, damage organs and tissues in every part of the body, and lead to life-threatening complications. The prevalence rate is measure of the proportion of a population affected by a specific condition in a specified time period.

**Prevalence = Number of cases of disease in given time period / total number in Population in that period**

Untreated hypothyroidism can lead to a number of health problems like Goiter, Myxedema Coma, Angina pectoris, Exacerbation of Myocardial Ischemia and Infraction, Peripheral neuropathy, Low bone density, Breathing problems, Mental health issues, Infertility, Birth defects, Bleeding issues, Changes in metabolism, Sexual and reproductive concerns.

The Clinical presentations of hypothyroidism vary depending on the severity of the hormone deficiency. It

tend to develop slowly often over a number of years. At first you may barely notice the symptoms of hypothyroidism such as fatigue and weight gain, or you may simply attribute them to getting older. [Rai GS et.al.,1995]. But as our metabolism continues to slow may develop more obvious clinical picture includes Fatigue, increased sensitivity to cold, constipation, dry skin, weight gain, puffy face, hoarseness, muscle weakness, elevate blood cholesterol level, muscle aches, tenderness and stiffness, pain, stiffness or swelling in joints, heavier than normal or irregular menstrual periods, thinning hair, slowed heart rate, depression, impaired memory and concentration, hair loss, slow pulse rate, poor appetite, delayed relaxation of tendon reflexes, carpal tunnel syndrome, abnormal sensation, pleural effusion, ascites, pericardial effusion, poor hearing. [Carolyn McMillan et.al.,2008] When hypothyroidism is not treated, it become more severe. Constant stimulation of thyroid gland to release more hormones may lead to an enlarged thyroid. In addition, patient may become memory impairment, and thought process may slow, or may feel depressed. Advanced hypothyroidism is known as Myxedema, is rare but when it comes it can be life threatening.[Davis Lowelle. MD et.al.,1988]

Clinical features include low blood pressure, decreased breathing, decreased body temperature, unresponsiveness and even coma. In extreme cases Myxedema can be fatal. The Complications of Hypothyroidism may include Goiter, Changes in metabolism, Heart problems, Mental health issues, Peripheral neuropathy, Myxedema, Infertility, Birth defects, Breathing problems, Bleeding issues, Sexual and reproductive concerns.

**Goiter:** By constant stimulation of thyroid gland, it will produce excessive amount of thyroid hormones leads to enlargement of thyroid gland, this condition is known as Goiter.

**Changes in metabolism:** Untreated hypothyroidism slows metabolism. Chemical reactions that fuel our body. A slow metabolism can lead to moderate weight gain. But it can also affect other things of our body. Almost every tissue and cell in our body depends on metabolism. It leads to fatigue slow speech and movements' weak muscles, trouble staying warm, constipation, high cholesterol. Slower metabolism can also lead to a fluid buildup in the angles, eyelids, tongue, and other places. A swollen tongue can make it hard to breath and may block the airways during sleep [Dana Stoian et al., 2016]

**Heart problems:** Hypothyroidism may also be associated with an increased risk of heart disease, primarily high levels of low density lipoproteins (LDL), cholesterol (bad cholesterol) can occur in people with an underactive thyroid. Even subclinical hypothyroidism, a mild or early form of hypothyroidism in which symptoms have not yet developed, can cause an increased in total cholesterol levels and impair the pumping ability of heart. Hypothyroidism can also lead to an enlarged heart and heart failure.[ Ali J Chakra et.al.1985]

**Mental health issues:** Depression may occur early in hypothyroidism and may become more severe over time. Hypothyroidism can also cause improper mental functioning. [Ahmed SA, et.al.,1985]

#### **Peripheral nerve damage**

Fluid buildup and swelling may exert pressure on nerves and damage or crush them. This leads to a condition called peripheral neuropathy. The symptoms of this type of nerve damage depend on the specific nerves that are affected. Symptoms include numbness, burning, tingling, muscle weakness; sensitive to touch [Garber JR et.al.,2012]. Sometimes the nerve damage from untreated hypothyroidism can lead to carpal tunnel syndrome. This causes pain, numbness, and tingling in the hand, wrist, and arm. [Ghadaa.mohamed a et al.,2017]

**Myxedema (coma):** This rare life threatening condition is the result of long term, undiagnosed hypothyroidism. Clinical manifestations include intense cold intolerance and drowsiness, profound lethargy and unconsciousness.

It may be triggered by sedatives, infections or other stress on body. (Resiss M ,1998).

**Infertility:** Low levels of thyroid hormone can interfere with ovulation, which impairs fertility. In addition some of the causes of hypothyroidism such as autoimmune disorder can also impair fertility. [Brain M.Case et al.,2015]

**Birth defects:** Babies born to women with untreated thyroid disease may have a higher risk of birth defects than babies born to healthy mothers. These children are also more prone to serious intellectual and developmental problems. [Li –Li Gong et al., 2016]

**Bleeding issues:** Low thyroid hormone can keep blood from clotting and cause heavier bleeding.

**Sexual and reproductive concerns:** Besides heavy periods women with untreated hypothyroidism can have other menstrual problems. Periods can happen less often. Both men and women can become infertile and have a lower sex drive.[ Ahmed SA, et.al.,1985]

#### **Hypothyroidism in pregnancy**

Even mild or subclinical hypothyroidism leads to possible infertility and increased risk of miscarriage. Hypothyroidism in early pregnancy, even with limited or no symptoms may increase the risk of pre-eclampsia, offspring with lower intelligence and the risk of infant death around the time of birth [M.Abalovich, 2004].

#### **Hypothyroidism in children and teens**

In general, children and teens who develop hypothyroidism have the same signs and symptoms as adults do, but they may also experience; poor growth, resulting in short stature, delayed development of permanent teeth, delayed puberty, poor mental development [Thomas CPT & Francis MC, 1992].

#### **MATERIALS AND METHODS**

**Study design:** This was prospective, epidemiological study conducted in Santhiram medical college & general hospital, this study was carried out from July 2017 to December 2017 after getting clearance from IEC. A total of 304 cases of thyroid abnormality were found during this study period. The data was collected from the patients that referred to central laboratory, of our hospital for thyroid function test, which includes T3, T4&TSH.

**Enrollment criteria:** All male or female objects referred to central lab for thyroid function test were included. Participates were excluded if they were thyroid ablation persons and the subjects having the chronic systemic illness or if they were receiving drugs that could interfere with thyroid function test.

**Study procedure:** All the subjects underwent medical history assessment, general clinical examination, before enrollment including examination of thyroid glands.

Evaluation of thyroid profile was done in the central clinical laboratory of our hospital.

Assess for thyroid hormone T3, T4, &TSH were performed by ECL technology. Based previous thyroid history & current thyroid function test results participants were classified using following definitions:

Subclinical hypothyroidism – It is defined as a serum TSH level above the upper limit, of the reference range with a serum T4 and T3 within the reference range.

Overt hypothyroidism – It is defined as a clinical syndrome of hypothyroidism associated with elevated TSH and decreased serum levels of T3 and T4.

The Prevalence of different thyroid function disorders were summarized as count and percentage. A chi-square test was used to determine the trends in the Prevalence of the disorder among different age group and genders.

## RESULTS AND DISCUSSION

During the 6 months study period we collected 304 hypothyroidism cases.

Period prevalence of hypothyroidism =  $304/1000 \times 100 = 30.4\%$

Hypothyroidism has been associated with many complications such as Obesity, Myxedema, Mental health issues, Birth defects, Coma, Hypertension, Low-birth weight, Placental abruption, and fetal death.

Hypothyroidism is a lifelong chronic condition particularly prevalent in women and the elders. The present study was initiated from July 2017 to December 2017; in this study we assessed the prevalence of hypothyroidism in all age group of patients in Santhiram general hospital. There are several important findings from this prospective analysis of 1000, subjects who underwent screening for abnormal thyroid function. Hypothyroidism was found to be a common form of thyroid dysfunction affecting 304 subjects (30.4%) of the study population.

In distribution of clinical presentation more prevalence was observed in weight gain  $n=29(9.6\%)$ , followed by non-pitting edema along with facial puffiness  $n=24(7.7\%)$ , anemia along with non-pitting edema  $n=21(6.7\%)$ , anemia along with facial puffiness  $n=21(6.7\%)$ , weight gain along with intolerance to heat  $n=21(6.7\%)$ , anemia along with weight gain  $n=18(5.8\%)$ , low pitch voice  $n=12(3.8\%)$ , anemia along with intolerance to heat  $n=12(3.8\%)$ , speech  $n=9(2.9\%)$ , poor hearing  $n=3(1.9\%)$ , facial puffiness  $n=6(1.9\%)$ , low pitch voice along with speech  $n=6(1.9\%)$ , this data was tabulated in Table No.1.

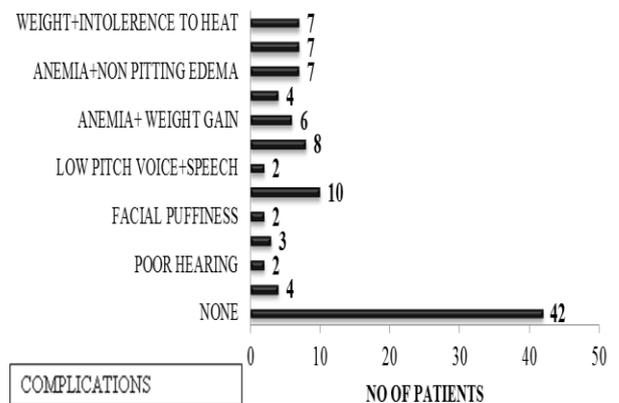
In distribution of hypothyroidism complications more prevalence is observed in Obesity  $n=125(41.36\%)$ , followed by Mental health issues  $n=95(30.76\%)$ , Myxedema  $n=17(5.76\%)$ , Obesity with Mental health

issues  $n=18(5.76\%)$ , Birth defects  $n=3(0.96\%)$ , this data was tabulated in Table No.2.

**Table. I: Clinical Presentations.**

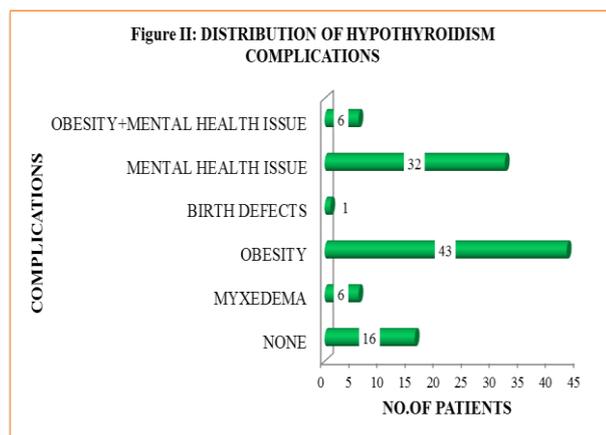
|       |                                    | Frequency | Percent |
|-------|------------------------------------|-----------|---------|
| Valid | None                               | 122       | 40.6    |
|       | Low Pitch Voice                    | 12        | 3.8     |
|       | Poor Hearing                       | 3         | 1.9     |
|       | Speech                             | 9         | 2.9     |
|       | Facial Puffiness                   | 6         | 1.9     |
|       | Weight Gain                        | 29        | 9.6     |
|       | Low Pitch Voice+Speech             | 6         | 1.9     |
|       | Non Pitting Edema+Facial Puffiness | 24        | 7.7     |
|       | Anemia+ Weight Gain                | 18        | 5.8     |
|       | Anemia+Intolerance To Heat         | 12        | 3.8     |
|       | Anemia+Non Pitting Edema           | 21        | 6.7     |
|       | Anemia+Facial Puffiness            | 21        | 6.7     |
|       | Weight+Intolerance To Heat         | 21        | 6.7     |
|       | Total                              | 304       | 100.0   |

**Figure I: DISTRIBUTION OF CLINICAL PRESENTATIONS**



**Table. II: Complications of Hypothyroidism.**

| S. No | Complications                  | Number of patients (n=304) | Percentage of complications |
|-------|--------------------------------|----------------------------|-----------------------------|
| 1.    | Myxedema                       | 17                         | 5.76                        |
| 2.    | Coma                           | 0                          | 0                           |
| 3.    | Obesity                        | 125                        | 41.36                       |
| 4.    | Birth defects                  | 3                          | 0.96                        |
| 5.    | Mental health issues           | 95                         | 30.76                       |
| 6.    | Obesity + mental health issues | 18                         | 5.76                        |
| 7.    | None                           | 46                         | 15.38                       |



## CONCLUSION

In this study we observe hypothyroid prevalence and its etiological factors, clinical and morphological pattern of hypothyroidism and outcome of treatment. Our study recommended a rational therapeutic approach in these hypothyroidism patients about complications and treatment. In the light of the study there is need for clinicians to refer hypothyroid patients as soon as diagnosis is made or suspected to endocrinologist for early evaluation and treatment of hypothyroidism and to reduce the prevalence rate of hypothyroid patients. Therefore a decrease the effect of clinical manifestations and their complications which evolve during the course of the treatment. This was a hospital based study, therefore the result present reflect true community picture. If therefore recommended to do similar study using large hypothyroid sample size at community level which would ascertain all the etiologies or factors of hypothyroidism. In this present study with low prevalence of hypothyroidism only few factors may study. Endocrinologist, clinical pharmacist care among hypothyroidism patients is vital. Therefore, it draws the attention of the healthcare providers towards continuing professional education and patient's education. Our study recommends to pay more attention to the necessity of continuing education for healthcare professionals and to increase patients' awareness regarding Hypothyroidism. Further research can clarify the judgments about the findings in this field. Treatments and preventive measures are available for the Hypothyroidism.

Clinical pharmacist is important in the care of patients in order to improve their quality of life by review patients' medications and laboratory results, and collaborate with patients to determine how to use their support systems and individual strengths to help alleviate patient's well being.

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## CONFLICT OF INTEREST

The authors have no conflict of interest.

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