

IDENTIFICATION OF HYPOTHYROIDISM: A CASE STUDY OF THE PATIENTS OF NIMRA HOSPITAL JAMSHORO, SINDH, PAKISTAN

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Abstract

The most prevalent thyroid gland condition is hypothyroidism which occurs when the thyroid's follicular cells are unable to produce enough thyroid hormones (THs) needed for body to function normally. Tetraiodothyronine (thyroxine), T₄ and tri-iodothyronine (T₃) are the two fundamental hormones produced by the thyroid gland (TG). THs are basically responsible for controlling the body's metabolism. Iodine is a major contributor to the global rise in thyroid-related illnesses. Additionally, many clinical manifestations, indications, and symptoms that the patients showed were examined, and the condition was established in relation to those symptoms. This cross sectional study has been quantitatively carried out and depends on a method of statistical data analysis. This cross-sectional study was carried out over a period of one year from July 2019 to November 2020. This case study conducted at two famous hospitals of Jamshoro namely LUMHS and NIMRA. Total participants were 105. Sampling was random; samples were males, females and children. The study has been conducted to analyze the hypothyroid patients coming from various parts of Sindh at OPDs of NIMRA and LUMHS who have been severely affected with other disorders as well. The study involved special designed questionnaire and laboratory test reports for the purpose of analyzing the pure patients of hypothyroidism. Thyroid function test (TFT) was done using enzyme-linked immunoassay (ELISA) techniques, Radioimmunoassay (RIA) test kits.

Keywords: Hypothyroidism, TG, THs, T₃, T₄, TFT, ELISA, RIA

INTRODUCTION

The thyroid's follicular cells play significant role in creating enough thyroid hormones (THs), required for normal body to function properly. The deficit of such supply of hormones can lead to hypothyroidism which is the most common thyroid gland disorder.

An adult men it is 20g, butterfly shaped endocrine gland called the thyroid located just below the larynx, front of trachea on either side divided into two lobes linked by an isthmus. The thyroid gland (TG) generates two essential hormones, tetra-iodothyronine, referred as thyroxin (T4), and tri-iodothyronine (T3)[1]. THs are primarily responsible for controlling metabolic activities in the body and are crucial for maintaining cardiovascular homeostasis. THs activate the myocardium's diastolic and systolic phases. The thyroid axis is controlled in the pituitary via TSH whereas the pituitary itself functions under the hypothalamus through TRH.[2] The term "thyroid disease" (TD) refers to a group of medical conditions that prevent your thyroid from producing the proper quantity of thyroid hormones. Hyperthyroidism and hypothyroidism are conditions where the thyroid produces excessive or less amounts of thyroid hormones respectively [3]. If you ignore hypothyroidism, you will have little amount of T3 and T4 in your blood, which can lead to fatigue, weight gain, and even the inability to tolerate cold temperatures [4] as well as cognitive decline, neuromuscular dysfunction, depression, hair loss, loss of sex drive, amenorrhea, and hyperlipidemia.[5] Although, hypothyroidism is a common endocrine condition with considerable clinical signs and symptoms. [6] Thyroid hormone resistance (a condition where tissues are unable to respond to THs due to mutations in the nuclear thyroid hormone receptor TR β) which can be treated by increasing the concentration of THs.[7] Laboratory findings are used to diagnose thyroid disorders (serum FT3, FT4 and TSH). Patients with a history of hypothyroidism who were taking levothyroxine or those whose serum free T4 levels were less than 0.89 ng/dl and their TSH levels was greater than 5.50 uU/ml were categorized as hypothyroid [8]. According to studies, 1.6 billion people worldwide have been diagnosed with thyroid problems in more than 110 countries, and WHO reported that 750 million individuals worldwide suffer from thyroid ailments as a result of inadequate iodine supplements. When a patient's thyroid gland was removed in the 19th century, hypothyroidism was first noticed as swollen hands, feet, faces, and eyes. [9]. Hypothyroidism is a condition that affects people of all ages, including those who are pregnant, infants, children, adolescents even in aged.[10] Congenital hypothyroidism is tested via iodine locations in pregnant women, where it is discovered that between 2% and 29.3% of all newborns all over the world have been diagnosed with this condition [11]. About 20 million Pakistanis live in localities where there is a lack of iodine, and 5-10% of Pakistanis have thyroid issues, with more hypothyroidism than hyperthyroidism being seen [12]. Thyroid problems are more common in Pakistan's hilly areas, such as Waziristan, Narran, Kaghan, Balakot, Hazara and Upper Punjab, KPK rural parts and the Kashmir. However, goiter was identified in 62.1% of school-age children in Islamabad. [8] Primarily there are two basic stages of thyroid hormones dysfunctions: clinical and subclinical. Free T3 and T4 normal level whereas TSH abnormal level is observed and no symptoms in subclinical while in clinical phase abnormal level of both T3 and T4 was observed.[11] The clinical signs of overt hypothyroidism (high TSH and low free T4) were clear but moderate had no visible symptoms and regular thyroid function testing revealed abnormalities. Individual grades of hypothyroidism are determined by the presence of circulating thyroid tissue antibodies, clinical symptoms, and blood TSH levels [13]. Between 4%

and 8% of the general population and up to 15% to 18% of women over 60 have subclinical hypothyroidism [14]. Clinical and subclinical hypothyroidism can be found in up to 4.1% of adults and 5.4% of children in Pakistan [15]. One of the key characteristics of hypothyroidism is that it lacks symptoms, making a huge portion of those who are affected by it, are unaware of their conditions [16]. Thus, Hypothyroidism can be primary, with low T4 and T3 levels but high levels of TSH and TRH; secondary, with low TSH, T4 and T3 levels but high levels of TRH; and tertiary, with low TRH, TSH, and T4 and T3 levels [17].

AIMS OF STUDY

- To determine the hypothyroidism in population of Sindh and analyze the potential factors of hypothyroidism.
- To determine the causes and associated disorders those affect thyroid gland and make thyroid gland weak and damage.

DESIGN OF RESEARCH/METHODS

This cross sectional study has been quantitatively carried out and depends on a method of statistical data analysis. This cross-sectional study was carried out over a period of one year from July 2019 to November 2020. This case study conducted at two famous hospitals of Jamshoro namely LUMHS and NIMRA. Total participants were 105. Sampling was random; samples were males, females and children. The study has been conducted to analyze the hypothyroid patients coming from various parts of Sindh at OPDs of NIMRA and LUMHS who have been severely affected with other disorders as well The data have been collected through special designed questionnaire and laboratory test reports for the purpose of analyzing the pure patients of hypothyroidism. As participants attended OPD, information was gathered by interviewing the patients about their sociodemographic, diets, sign and symptoms, treatment and laboratory tests. Endocrinologist Doctors patients were initially treated with levothyroxine or FT3, FT4 and TSH tests therapy, if any threaten condition is found the patients underwent ultrasound examination at Radiology department of NIMRA Hospital.

Case study is very popular method and is widely used in researches like social sciences and natural sciences a case study, according to Yin (1994), is "an empirical investigation that examines a current phenomenon inside its real-life context, particularly when the borders between phenomenon and context are not readily obvious... and makes use of a variety of sources of proof. [18]

RESULTS

By using radioimmunoassay techniques (ELISA), immunoassay test kits, Tri-iodothyronine, T4 (thyroxine), and TSH (thyroid stimulating hormone) were measured at serum level to determine the degree of thyroid hormone deficit.

Graph No 1: This Column chart showing the gender wise distribution of patients of Hypothyroidism



The aforementioned column chart demonstrates that 105 people were found to have hypothyroidism, 59 of whom were female and 41 of whom were male, with 5 being minors.

Table No 1: This table shows the number of Patients of Hypothyroidism and their Prevalence in NIMRA and LUMHS Hospitals.

Disorder	Hospital NIMRA	Prevalence in NIMRA	Hospital LUMHS	Prevalence in LUMHS	Total Observed Count
Hypothyroidism	67	63.80%	38	36.19%	105

This table is showing the number and percentage of hypothyroidism's patients observed at NIMRA were 67 making 63.80% while in LUMHS were 38 (36.19%) total were 105.

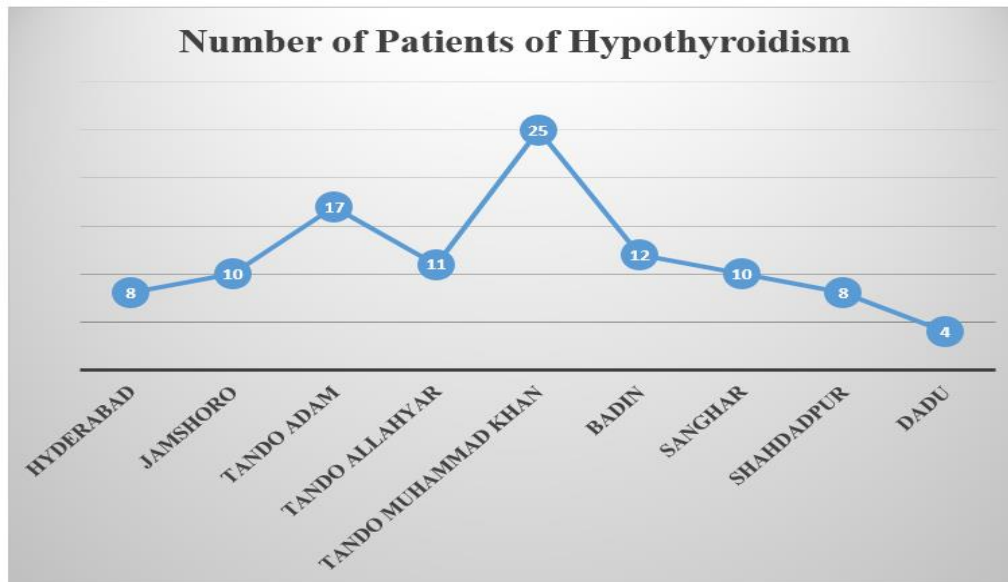
Table No 2: This Table is showing the gender wise distribution of patients of Hypothyroidism in NIMRA and LUMHS hospitals of Jamshoro.

Genders	NIMRA	LUMHS	Total observed count	Percentage
Male	23	16	39	37.14%
Female	41	20	61	58.09%
Children	3	2	5	4.76%
Total	67	38	105	

The 23 cases in males of Hypothyroidism were detected at NIMRA while 16 found at LUMHS makes 39 showing 37.14 % at both hospitals out of 105. Again in Females 41 cases of hypothyroidism were observed at NIMRA whereas at LUMHS were observed 20 cases which makes 61 showing 58.09% at both hospitals. Although 3 cases of hypothyroidism were detected in children at NIMRA and 2 at LUMHS, making total 5 at both hospitals with percentage of 4.76% out of 105. Total number of patients with

hypothyroidism at NIMRA was 67 whereas at LUMHS was 38 making 105 at both hospitals.

Graph No 2: This line chart is showing the Number of patients of Hypothyroidism in Various cities of Sindh



The number of Hypothyroidism patients in the region Hyderabad and Jamshoro was 8 and 10, whereas in Tando Adam was 17, Tando Allahyar was 11, Tando Muhammad Khan was 25 that was highest number among the cities of Sindh, further 12 patients with hypothyroidism were diagnosed belongs to Badin and 10 was belonging to Sanghar, furthermore, the 8 cases of hypothyroidism were also observed which belongs to Shahdadpur and besides it few about 4 patients were belonging to Dadu who had this disorder.

CONCLUSION

The present study has been conducted to evaluate clinical manifestation and pathophysiological features of hypothyroidism in both sexes at NIMRA and LUMHS, district Jamshoro. The patients who have participated in this study are coming from various parts of Sindh and belonged to different regions that is shown in Graph No: 2. the study has proved that in various areas of Sindh were diagnosed with hypothyroidism. The patients observed at NIMRA were 67 making 63.80% while in LUMHS were 38 (36.19%) total were 105. Among them 39 were male showing 37.14 %at both hospitals out of 105 while the cases of females were 61 showing 58.09% at both hospitals where as hypothyroidism found in children were 5 at both hospitals with percentage of 4.76% out of 105 which is mentioned in Table No: 2. This study's conclusion is that women are more likely than men to develop hypothyroidism. Iodine deficiency in the diet was the main contributing factor to hypothyroidism.

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