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Study of Anemia in Primary Hypothyroidism

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Abstract

Background: According to the data of WHO, anaemia prevalence is 24.8% throughout the world and it is seen more frequently in underdeveloped countries. Anaemia affects 1.62 billion people worldwide;this is roughly 25%of the global population. One of the causes for anaemia is hypothyroidism. The goal of our study is correlating between anaemia and hypothyroidism and the importance of thyroid hormone in maintenance of hematopoietic system regulation.

Method: It was a cross sectional observational study. Total 125 hypothyroid patients were analysed. Hypothyroid and anaemia panel tests were performed in all patients. Peripheral smear and other investigations like Serum Ferritin, Serum Iron, TIBC levels (Total Iron Binding Capacity), Saturation of Transferrin and Vitamin B12 levels, Folic acid levels, and Reticulocyte count were performed accordingly.

Results: Out of 125 primary hypothyroid patients, 75 patients had anaemia and out of which normocytic anaemia was the most common presentation.

Conclusion: In our study we found that there is significant correlation between hypothyroidism and anaemia. So it is important to evaluate hypothyroid patients for anaemia and its type and treat accordingly.

Keywords*:* Hypothyroidism, Anaemia, Normocytic Anaemia.

Introduction

Hypothyroidism is defined as the clinical and biochemical signs of thyroid hormone insufficiency. Worldwide, 2 to 5% of the population suffer with hypothyroidism, which varies from country to country. Hypothyroidism is seen more commonly in women and elderly people. More than 99.5% of cases of primary hypothyroidism, in which the condition affects only the thyroid gland, are found in iodine-deficient areas of the

world. Pituitary or hypothalamic disorders leading to hypothyroidism is called central hypothyroidism which accounts for less than 0.5 percent cases of total cases. [1] The metabolic functions of the body slowdown as a result of hypothyroidism, and practically any organ system may be impacted. Bradycardia, sensitivity to the cold, constipation, exhaustion, and weight gain are some of itssymptoms. Age of onset and hormone deficit status may affect the severity of signs &symptoms. A metabolic slowdown can also affect hematopoiesis.Thyroid hormones have direct effect on blood parameters by stimulating erythrocytes precursors and indirectly by enhancing erythropoietin production. According to studies, twenty to sixty percent of hypothyroid patients are anaemic. [2,3] Different forms of anaemia might develop in the course of thyroid dysfunction. Normocytic anaemia is the most common, while macrocytic or microcytic anaemia occurs less frequently. The most common cause of anaemia in hypothyroid patient is bone marrow suppression brought on by a lack of thyroid hormone, which also results in impaired erythropoietin synthesis. Hence, relation between hypothyroidism and anaemia needs to be evaluated. [4]

Thyroid hormones either directly or indirectly induce the development of erythroid colonies through erythropoietin. To treat anaemia adequately, restoring thyroid function is necessary in addition to specific treatment for anaemia. In this study, we assessed prevalence of anaemia, its type and severity in patients with primary hypothyroidism.

Inclusion Criteria

Patients from the age group of 18-70 years of both male and female with primary hypothyroidism were included in study.

Exclusion Criteria

Patients below 18 years of age, pregnant women, Patients with haemolytic anaemia, Patients under the treatment that might affect blood parameters such as steroids or had received anaemia treatment were not included in the study.

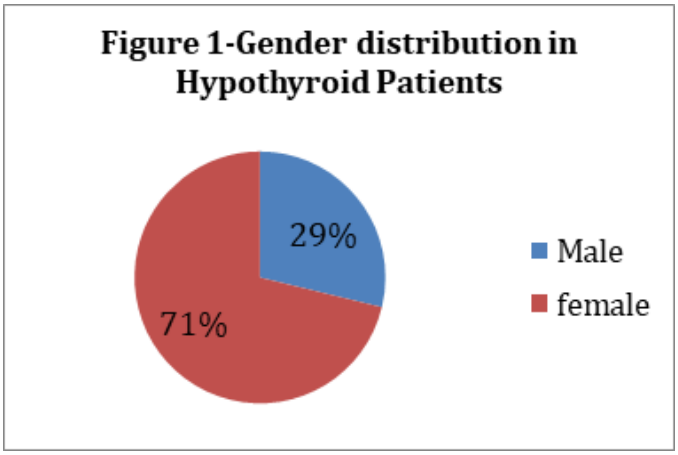
Material And Methods

125 Primary Hypothyroid patients presented to hospital during the time period of 18 months were enrolled for study.

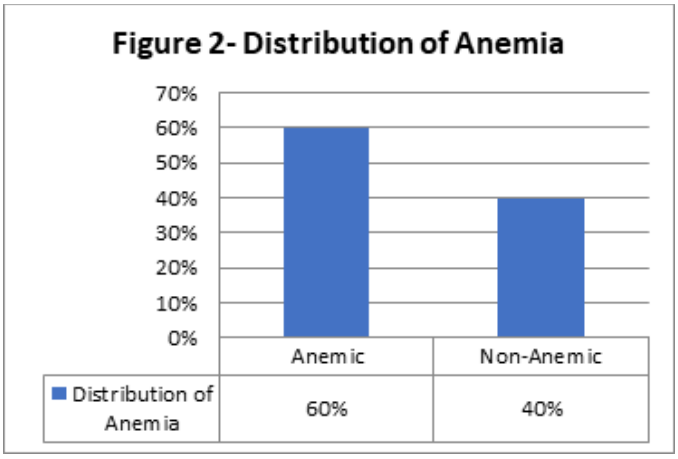
Detailed history of the patients was taken. Detailed examination was done of all patients. All the cases were subjected to laboratory investigations. Thyroid profile and Anaemia Panel (Males with Haemoglobin <13g/dl and females with <12g/dl) consisting of Serum Ferritin, Serum Iron, TIBC levels (Total Iron Binding Capacity), Saturation of Transferrin and Vit B12 levels, Folic acid levels, Peripheral Blood Smear, Reticulocyte count were investigated. Appropriate investigations were done wherever indicated and wherever possible to rule out any other primarily existing conditions. Patients were also classified in mild (Hb11.0 g/dl to lower limit to normal), moderate (Hb-8.0 g/dl to 10.9 g/dl) and severe (Hb less than 8 g/dl) anaemia according to level of haemoglobin.

Results

The mean age of hypothyroid subjects in our study was 49.33 ± 13.35. It was also observed in our study that anaemia was more prevalent in more than 50 years of age group of hypothyroid patients. Gender wise distribution in our study showed female predominance 71%.



In the study, the majority (60%) 75 patients were having anemia out of 125 patients with Hypothyroidism.



Out of 75 patients, the most common type of Anaemia observed was normocytic normochromic anaemia (58.7%) followed by microcytic hypochromic (38.7%) and macrocytic anaemia (2.7%).

Table 1: Type of anaemia in hypothyroid patients

Peripheral smear (type of anemia)			
		Frequency	Percentage
	Macrocytic hypochromic	2	2.7%
	Microcytic hypochromic	29	38.7%
	Normocytic normochromic	44	58.7%
	Total	75	100.0%

Among the anaemic patients in this study,56% had moderate anaemia and 33.33% of the hypothyroid patients had mild anaemia, while 10.66% of the hypothyroid patients had severe anaemia.

Table 2: Severity of anaemia in hypothyroid patients

	Male	Female	Total Anaemic Patients
Mild	09	16	25 (33.33%)
Moderate	06	36	42 (56%)
Severe	03	05	08 (10.66%)
Total	18	57	75 (100%)

Discussion

Hypothyroidism is a common disease with varying frequency between countries. Hypothyroidism prevalence in the world population is up to 5% with a further estimate of 5% being undiagnosed. [5] It has been found that low erythropoietin levels and the metabolic consequences of low thyroid hormones are responsible for anaemia in hypothyroidism. [6] In India, anaemia is a significant public health issue. To effectively treat individuals with anaemia, the etiological cause of anaemia must be identified. Our study's objective was to determine the prevalence of anaemia among hypothyroid patients. In our study out of 125 hypothyroid patients, 60% had anaemia.

Gender wise distribution in our study saw female predominance 71%. Many studies have revealed that hypothyroidism is more common in women than in men.

In our study out of 125 hypothyroid patients 75 patients were anaemic. Out of 75 patients, the most common type of Anaemia observed was normocytic normochromic anaemia (58.7%) followed by microcytic hypochromic (38.7%) and macrocytic anaemia(2.7%).According to the study conducted in eastern India by Das C et al among the anaemic patients with hypothyroidism, 51.6% had normocytic anaemia, 43.2% had microcytic anaemia, 10% had megaloblastic anaemia. In the study conducted by Patil B et al, 58% had shown Normocytic Anaemia followed by Microcytic Hypochromic (21%).[7] A study conducted

by Peraka SA et al, there were 98% normocytic anaemia seen followed by 0.95% microcytic anaemia.[8]

Among the anaemic patients in this study, 56 % had moderate and 33.33% of the hypothyroid patients had mild anaemia, while 10.66% of the hypothyroid patients had severe anaemia. Mild anaemia was the most prevalent kind of anaemia seen in male patients (50%) and was followed by moderate anaemia (33.33%) and severe anaemia (16.66%). While moderate anaemia was more prevalent in anaemic female patients (63.15%), it was followed by mild anaemia (28.07%), and then severe anaemia (8.77%).

In the study done by Peraka SA et al [8], mild anaemia was observed in 59% while 39% were moderate anaemia.

Conclusion

This study concluded that anaemia is prevalent among primary hypothyroid patients. The most prevalent type of anaemia among hypothyroid patients is Normocytic Normochromic Anaemia, followed by Microcytic Hypochromic Anaemia and Macrocytic Hypochromic Anaemia. The study suggests that hypothyroidism should be regarded as factor for the development of anaemia. Hence early replacement of thyroid hormone would be beneficial in treating hypothyroidism as well as anemia.

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