

Frequency of Different Type of Anemias in Hypothyroid Patients: Cross-Sectional Study

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ABSTRACT

Background: Thyroid hormones are essential for the normal mental and physical development but unfortunately, thyroid dysfunctions are common endocrine disorders.

Aim: To determine the frequency and different type of anemia in hypothyroid patients.

Study Design: Cross sectional study.

Methodology: A total of 108 patients with hypothyroidism, 25 to 65 years of age were included. Pregnant women, history of blood transfusion within last one month, CLD & CRF were excluded. After this, 5ml blood sample was taken and sent to the institutional pathology laboratory for measuring hemoglobin and serum ferritin and presence or absence of anemia and its types was noted. The collected data was analyzed by using SPSS. Chi square were applied with P-value< 0.05 as significant.

Results: Age range in this study was from 25 to 65 years with mean age of 42.18 ± 8.64 years. In this study, frequency of anemia was found in 43 (39.81%) hypothyroid patients with 65.12% patients have normo-cytic normo-chromic anemia.

Conclusion: It was concluded that frequency of anemia in hypothyroid patients was very high with normocytic normochromic anemia as the most common type.

Keywords: Anemia, Hypothyroidism and Types of Anemias.

INTRODUCTION

Anaemia is a hemoglobin deficiency among patients due to decreased number of red blood cells¹ Ranges of hemoglobin, haematocrit and RBCs depend on multiple factors as well as their circulating levels. They usually depend on both total red cell mass and plasma volume. Other important and critical variables that affect their levels include age, gender, race and physical state of an individual². Majority of clinical laboratories use age and gender as bench mark thus publish their own gender specific ranges. There are many ways to classify anemia among individuals. They can classify it on the basis of size of RBCs, its degradation either intravascular or extra-vascular or blood loss as revealed by literature review. Thus they can be either macrocytic, normocytic or microcytic depending on mcv³.

Endocrine system play vital role in well being of an individual. Hormones are the secretions from glands that perform specific actions while working on specific receptors. Among all hormones, thyroid hormones are the most important as they perform different but essential functions. They play role in the development of brain and body, maintain body homeostasis and control metabolic processes but unfortunately, its dysfunctions is a common endocrine health issue⁴. Many studies in the past have concluded that raised TSH and low T3,T4 levels which indicate hypothyroidism affect more females especially during their reproductive age⁵. General victims of hypothyroidism are ladies who can present with weight gain and sluggishness.

Its prevalence is variable from one society to another due to many reasons like diet, exposure to sunlight and toxins. One study reported that hypothyroidism has a prevalence of around 2–5% globally^{3,6}. Unfortunately, in coming years, its prevalence is going to increase by two folds according to WHO. However, research data has shown that subclinical hypothyroidism has high prevalence of about 4-10% among adults females especially^{4,7}. Signs and symptoms of thyroid dysfunction are highly variable. They usually depend on factors like age of onset, exposure, treatment status and the duration with severity of disease⁸.

On the other hand, anemia is a common health issue especially its prevalence in association with subclinical and overt (73.2%) respectively^{6,9}. Thus, it was concluded from the previous

hypothyroid groups has been reported to be high (26.6% and results that low circulating hemoglobin in subclinical hypothyroids is high in comparison to general population (non-hypothyroids). Therefore, presence of hypothyroidism is a risk factor for anemia. It has been documented that iron deficiency anemia (43.2%) results in microcytic anemia.⁸ Iron deficiency anemia is the commonest type due to many reasons like low protein intake and physiological bleeding among females. One study revealed that hypothyroid patients suffer from anemia more commonly and 75% of thyroid dysfunction is linked with anemia¹⁰.

As majority of our population belong to rural areas and poor socioeconomic status where proper nutritional needs cannot be met, so there is a need of a local study to determine the magnitude of the problem thus current project was planned. The results of this study will not only provide the local stats of the problem but also encourage our public for early screening and managing anemia in these particular patients in order to reduce the complications of anemia. Then based on these results, public awareness programs on national levels can be created regarding this major public health issue among our population as well as treating clinicians for a better future outcome in every aspect to reduce the morbidity.

The objective of the study was to determine the frequency and different type of anemia in hypothyroid patients.

METHODOLOGY

Present cross sectional study enrolled total of 108 diagnosed hypothyroid patients for more than 01 year with age ranging from 25-65 years. Pregnant women, history of blood transfusion within last one month, CLD & CRF were excluded. After this, 5ml blood sample was taken and sent to the institutional pathology laboratory for measuring hemoglobin and serum ferritin and presence or absence of anemia and its types was noted. Informed consent was taken after permission from Ethical Review Committee.

Statistical analysis: Data was analyzed by using SPSS v.26. Frequencies and percentages were used for quantitative variables. Chi square were applied with P-value< 0.05 as significant.

RESULTS

Results showed that present study enrolled more females (n=62) than males (n=46) and their age was presented as mean± SD as shown in table-1.

Received on 09-11-2021

Accepted on 29-05-2022

Table-1: Quantitative Data of Subjects (n=108)

Variables	Groups	Frequency	%age
Gender	Males	46	42.59
	Females	62	57.41
Age (years)	25-45	71	65.74
	46-65	37	34.26
	Mean \pm SD	42.18 \pm 8.64	
Duration of disease (years)	<5	65	60.19
	>5	43	39.81
	Mean \pm SD	5.76 \pm 2.31	
BMI (kg/m ²)	<27	55	50.93
	>27	53	40.07
	Mean \pm SD	27.55 \pm 3.03	

In this study, frequency of anemia was found in 43(39.81%) hypothyroid patients. Majority (65.12%) patients have normocytic normochromic, 25.28% has microcytic hypochromic anemia and 9.30% had macrocytic anemia as shown in table-2.

Table-2: Different type of anemia in hypothyroid patients (n=43)

Type of anemia	Frequency	%age
Microcytic hypochromic anemia	11	25.58
Macrocytic anemia	04	9.30
Normocytic normochromic	28	65.12

Data was stratified for age in-order to see its effect on anemia. Results showed insignificant p-value of 0.347 in table-3.

Table-3: Stratification of Anemia with Respect to Age Groups

Age (years)	Anemia		p-value
	Present	Absent	
25-45	26	45	0.347
46-65	17	20	

DISCUSSION

Prevalence of hypothyroidism is variable from one society to another but according to an estimate, it is the most prevalent type with a reported frequency of 2–5% globally.^{3,6} However, subclinical hypothyroidism has prevalence of about 4-10% among adults, with possibly a higher frequency in older women.^{4,7} The clinical picture of this disease is highly variable, and dependant on age of onset and the duration with severity of hormonal deficiency.⁸ Thyroid dysfunction affects all organ systems are affected, and these symptoms and findings show different characteristics depending on the occurrence age of the hypothyroidism and deficiency or inefficacy of thyroid hormones.¹¹

In this study, frequency of anemia was found in 43 (39.81%) hypothyroid patients with 65.12% patients have normocytic normochromic, 25.28% has microcytic hypochromic anemia and 9.30% had macrocytic anemia. Similar results were shown by one study that reported frequency of anemia to be 18% in the subclinical hypothyroid patients.¹²

Anemia is a common finding in patients with hypothyroidism. Normochromic normocytic (anemia of chronic disease), hypochromic microcytic and megaloblastic types are all reported by different authors.¹²⁻¹⁴ One study reported that anemia in 65% of children and adolescents with hypothyroidism.¹⁵ Similarly, literature review revealed that it was a common finding in infants with congenital hypothyroidism.¹⁶

Limitations: No genetic workup among patients was done. Resources were limited with financial constrains.

CONCLUSION

It was concluded that frequency of anemia in hypothyroid patients was very high with normocytic normochromic anemia as the most common type. In the light of above discussion, one can find that need of an hour is to have proper workshops on monitoring of anemia among hypothyroid patients. Government should educate people regarding this common but important health issue.

Authors' Contribution: RW&QUA: Conceptualized the study, analyzed the data, and formulated the initial draft, SK&AS: Contributed to data collection, NM: Proof read the final draft and analyzed data,

Conflict of interest: None

Funding: None

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