

**PREVALENCE OF VARIOUS TYPES OF ANEMIA IN PATIENTS OF
HYPOTHYROIDISM IN A TERTIARY CARE CENTER IN TELANGANA, INDIA****Dr. Mohd Ashraf ul Abeddin¹ and Dr. Fakeha Firdous*²**¹Assistant Professor Dept of General Medicine, Shadan Institute of Medical Sciences, Telangana, India.²Associate Professor, Dept of Pathology, Shadan Institute of Medical Sciences, Telangana, India.***Corresponding Author: Dr. Fakeha Firdous**

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ABSTRACT

Anemia and hypothyroidism are both common diseases in the community. We need to evaluate the prevalence and types of anemia in primary hypothyroid patients because both have significant medical implication. The association of anemia with primary hypothyroidism has been common knowledge for many years. However; its pathogenesis is far from clear in many cases. Often the causes of anemia are manifold. Thyroid hormones directly or indirectly, through erythropoietin, stimulate growth of erythroid colonies. Anemia is often the first sign of hypothyroidism. Hypothyroidism can lead to a wide variety of anemic disorders.[f]

KEYWORDS: Hypothyroidism, Anemia, Hemogram, Serum TSH.**AIMS AND OBJECTIVES**

In this study, we correlate the serum TSH levels and hemogram of 51 patients to determine the prevalence of various types of anemias in hypothyroid patients without any obvious cause of anemia.

MATERIALS AND METHODS

Fifty one adult patients including 42 females [nonpregnant] and 9 males without any obvious cause of anemia who were visiting regular medicine out patient department were included. All patients were subjected to full medical history, clinical examination, complete hemogram and serum TSH were done and analyzed. They had no obvious causes of anemia. Patients with chronic diseases, infection, malignancy, hemoglobinopathies, bleeding diathesis were excluded from our study. Anemia has been defined as hemoglobin less than 13 gram/dl in male, or less than 12 gram/dl in female. 27 subclinical and 24 overt hypothyroidism patients as per standard definition were included. The patients first underwent complete blood count for inclusion in the study. On the basis of red cell indices (MCV) anemia has been classified as normocytic normochromic (MCV 80-100 fl), microcytic hypochromic (MCV<80 fl), and macrocytic (MCV>100 fl). For microcytic anemia, stool for occult blood, upper gastrointestinal endoscopy, iron profile study, HPLC for hemoglobinopathies were done. Serum assay of vitamin B12, folic acid, anti parietal cell antibody tests were performed for macrocytic anemia. In normocytic anemia,

Coomb's test and bone marrow examination were also done. Anemia was classified as mild, moderate, and severe when hemoglobin (Hb) concentration were (10-12 gm/dl), (8-10 gm/dl) and (<8 gm/dl) respectively.

RESULTS AND ANALYSIS

Out of the 51 patients studied which included 42 females and 9 males, anemia was seen in 23 cases [M-2, F-21], TSH elevated in 24 cases [M-5 F-19], anemia with TSH elevated seen in 15 cases [M-2, F-13].

Normocytic, normochromic anemia was present in 2 patients (13%) microcytic anemia in 9 patients (60%). 2 patients (13%) had megaloblastic anemia with vitamin B12 deficiency. 2 patients (13%) had combined deficiency of iron and vitamin B12.

The mean age of the patients was 42-years. 82 percent patients were female. The prevalence of various types of anemia has been shown in Table 1 and Figure 1.

Table-1.

| Anemia type | Mild[10-12gm%] | Moderate [8-10gm%] | Severe [<8gm%] |
|-------------------------|----------------|--------------------|----------------|
| Normocytic normochromic | 2 | 0 | 0 |
| Microcytic hypochromic | 2 | 7 | 0 |
| Megaloblastic | 0 | 2 | 0 |
| Combined iron and B12 | 0 | 2 | 0 |

Prevalence of various types of anemia in patients of anemia with primary hypothyroidism.

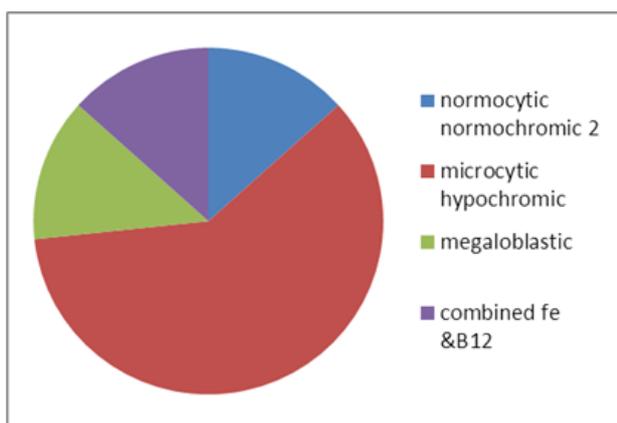


Figure 1: Showing percent of various types of anemia in cases of hypothyroidism.

Among those with normocytic normochromic anemia, seen in 2 cases[13%],microcytic hypochromic in 9 cases[60%], deficiency of vitamin B12[megaloblastic] in 2 cases [13%], 2 cases[13%] patients had deficiency of both iron and vitamin B12. 6cases [40%] patients of this group had only mild anemia,9 cases[60%] had moderate, none[0%] had severe anemia.

DISCUSSION

Thyroid hormones directly or indirectly, through erythropoietin, stimulate growth of erythroid colonies (BFU-E, CFU-E). Normocytic anemia is characterized by reticulopenia, hypoplasia of erythroid lineage, decreased level of erythropoietin, mainly regular erythrocyte survival. Acanthocytosis findings in cytologic blood smear suggest hypothyroidism in about 90% of cases^[1]

Numerous mechanisms are involved in the pathogenesis of these anemias which can be microcytic, macrocytic and normocytic. Microcytic anemia is usually ascribed to malabsorption of iron and loss of iron by menorrhagia. Macrocytic anemia is caused by malabsorption of vitamin B12, folic acid, as seen in pernicious anemia and in inadequate nutrition. Normocytic anemia is characterized by reticulopenia, hypoplasia of erythroid lineage, decreased level of erythropoietin, mainly regular erythrocyte survival.^[2]

Hypothyroidism is a common disease with varying frequency between countries. As decreased thyroid hormone adversely affects erythropoiesis, anemia

develops in hypothyroidism. In our study, 79% of hypothyroid patients were female, and the most frequent cause of hypothyroidism was determined to be primary hypothyroidism arising from chronic autoimmune thyroiditis^[3] consistent with the literature. According to the data of WHO, anemia prevalence is 24.8% throughout the world and it is seen more frequently in underdeveloped countries.^[4] Therefore, presence of hypothyroidism is a risk factor for anemia. Lack of stimulation of erythroid colony development by thyroid hormones, reduction in oxygen distribution to tissues and diminution of erythropoietin level in the absence of thyroid hormones leads to normocytic anemia, which is the most frequent type of anemia in hypothyroid patients - study by Erdogan and colleagues.^[5] Prevalence of vitamin B12 deficiency increases along with the age and the prevalence was observed as 1.6% to 10% in Europe.^[6] In our study, vitamin B12 deficiency was 13 % similar with these values. It mostly occurs as a result of malabsorption due to pernicious anemia accompanying hypothyroidism. Folic acid deficiency is uncommon in hypothyroidism, which is corroborative with our study.

The most common type of anemia in our series is microcytic anemia due to iron deficiency (60%) which is one of the most frequently seen diseases in all over the world. Larson found that 52 % (13 out of 25) of his patients of hypothyroidism had iron deficiency anemia, based on the finding of a low determination of serum iron^[7]Iron deficiency anemia largely due to menorrhagia occurring as a result of various hormonal instability and malabsorption observed in hypothyroidism.

CONCLUSION

Anemia in hypothyroid needs to be properly evaluated because treatment will depend on the type of anemia. The prevalence of anaemia was higher in overt hyperthyroidism. Systematic measurement of thyroid-stimulating hormone in anaemic patients is likely to be useful only after excluding common causes of anaemia.

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Author Dr. Fakeha Firdous designed the study,

wrote the protocol, did the literature searches, analyses of the study and wrote the first draft of the manuscript.

Author Dr. Mohd Ashraf ul Abeddin managed the clinical diagnosis, referral of samples to the laboratories and treatment of the cases. Both authors read and approved the final manuscript.

CONSENT

Taken from patients.

COMPETING INTEREST

None

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