

Ministry of Higher Education  
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University of Diyala  
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## Serum ferritin levels in Iraqi Women with telogen effluvium

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## Abstract

**Background:** Telogen effluvium is one of the most common causes of alopecia. It is a hair disorder characterized by excessive shedding of hair. Several factors such as drugs, trauma, emotional and psychological stress can lead to development of telogen effluvium.

The aim of the study was to evaluate the association between telogen effluvium and serum ferritin level

**Patients and methods:** Sixty five female patients were seen in outpatient clinic of Baquba Teaching Hospital with hair loss with a mean age of  $(24.8 \pm 4)$ , on examination by doing pull test all diagnosed as telogen effluvium, serum ferritin was assessed to them.

**Results:** From sixty five female patients were seen in outpatient clinic of Baquba Teaching Hospital with telogen effluvium, only three patients had low serum ferritin level (1.95%).

**Conclusion:** There was no relationship between telogen effluvium and serum ferritin level.

Key words: Telogen effluvium, serum ferritin, pull test

## Introduction

Hair loss among women is a challenging common problem for Dermatologists. Hair loss prevalence among Iraqi women is unknown while it affects more than 25% of women in developed countries<sup>(2)</sup>. The most frequent causes of hair loss are telogen effluvium (TE) and female pattern hair loss (FPHL)<sup>(2)</sup>. Telogen effluvium is of two types acute and chronic, which is resulted from shifting of high percentage anagen to telogen hair to low percentage (from 90/10 to 70/30). The main precipitating causes of telogen effluvium are emotional stress, nutritional deficiencies, surgery, pregnancy, labour and medications<sup>(3)</sup>. FPHL (familial disease) had an androgen and genetics basis in its etiology<sup>(4)</sup>.

TE is characterized by diffuse hair shedding, often with acute onset <sup>(5)</sup>. A chronic form with more insidious onset and a longer duration also exists <sup>(5,6,7)</sup>. It is an abnormality of the hair cycle characterized by abrupt, generalized shedding of normal club hair <sup>(8)</sup>. It manifests after (5–6) months in reaction to various physical or mental stress including childbirth, fever, crash dieting, major surgery, certain drugs, and vitamin and mineral deficiencies. It is diagnosed by doing pull test, which is done by delicate pulling of band of hair ranging from 20 to 30 hair in each pull and seen the hair loss ,if it is more than 5 hair in each pull it indicate telogen effluvium<sup>(9)</sup>. Some studies suggest relationship between hair loss and iron deficiency in TE<sup>(5,9)</sup>. Iron deficiency can also induce chronic diffuse telogen hair loss, cheilosis, and koilonychias <sup>(10)</sup> . Iron is involved in many critical physiologic processes within the hair follicle, suggesting that iron deficiency could disrupt hair synthesis. However, studies of iron as a cause of hair loss have produced conflicting results. Some of these discrepancies may relate to the limitations of assays for detecting iron deficiency, the most common nutritional deficiency in the world today<sup>(5,10)</sup>. Iron in the body is divided into storage iron, transport iron, and functional iron compartments. Storage iron, which represents the body's iron (either ferritin or hemosiderin), is best measured by the concentration of serum ferritin<sup>(5,10)</sup>.

Transport iron is the iron bound to transferrin to transport iron to tissue. Functional iron, the iron bound to hemoglobin, is measured by the concentration of hemoglobin and hematocrit<sup>(5,10)</sup> .Definitions of iron deficiency according to those compartments include iron depletion, iron-deficient erythropoiesis, and iron deficiency anemia. In iron depletion, functional and transport iron are normal but storage iron is decreased. In iron-deficient erythropoiesis, both storage and transport iron are

decreased, while in iron deficiency anemia, all three iron compartments are decreased<sup>(10,11)</sup>. Iron deficiency anemia can also be defined as absent bone marrow iron stores (determined by bone marrow iron smears), an increase in hemoglobin concentration by more than 1.0 g/dL after iron supplementation therapy, or abnormal values of other biochemical tests such as serum ferritin level (normal level is ranged between 12- 300 ng/ml)<sup>(5,10)</sup>. Ferritin is a highly conserved protein complex that plays an important role in storage iron and is recognized as the main iron-binding protein in non-erythrocyte cells<sup>(10,11)</sup>.

Only iron deficiency causes very low serum ferritin concentrations; therefore, a low serum ferritin level is specific to iron deficiency. The standard range of ferritin for women is between 12 and 150 Nano grams per milliliter. However, normal does not mean the optimal level, and 70 ng/ml and above is considered to be optimal for both men and women<sup>(12)</sup>. Because there is controversy regarding the causative association of iron deficiency with TE. The aim of our study is to evaluate the relationship between serum ferritin and telogen effluvium.

### Patients and Method

This study employed cross-sectional study. Ethical approval was obtained from the Institutional Ethical Committee before the commencement of the study. Enrolled in the study sixty five females patient with hair loss were seen in outpatient clinic of Baquba Teaching Hospital for the period from (1 October 2022 to March 2023) their ages ranged from (16--56) years with a mean age of (24.8±4) years. They complained of hair loss of (two months to three years duration). On examination by doing pull test all had telogen effluvium. All patients were fully interrogated regarding detailed medical history and physical examination to rule out other functional and structural cause of hair loss, previous attacks of hair loss and family history of the same condition also pull test were used to asses type of hair loss. All patient were

assessed regarding serum ferritin level , the data calculated by using clinic square.

## Results

Sixty five females patients with hair loss were seen in out patient clinic of Baquba Teaching Hospital their ages ranged from (16-56) years with a mean age of  $(24.8 \pm 4)$  years . They complained of hair loss of (two months to three years duration)and not complained from other causes of hair loss as we discussed above it was diagnosed clinically as T.E. By assessment of their serum ferritin level ,the results show only three patients had low serum ferritin (1.95%) and this indicate that there's no relationship between telogen hair loss and serum ferritin level.

## Discussion

Our study included sixty five Iraqi females patients seen in outpatient clinic of Baquba Teaching Hospital, their serum ferritin levels was normal except three patients had low serum ferritin which indicate that there was no effect of ferritin deficiency on T.E. This study go with and concordant with a study done in Britain in 1 November 2002<sup>(13)</sup>. Also go with study done in the Duke University with 381 Caucasian women in December 2010<sup>(14)</sup> , both study revealed that there's no relationship between Telogen hair loss and serum ferritin level. But our study was incorcordent with study done in China-Japan friendship hospital in January 2022 with 264 patients <sup>(15)</sup>. Also incorcordent with a study done in Makah region, Saudi Arabia in 2015 , both studies revealed that there was decreasing in serum ferritin level in association with telogen hair loss.

## Conclusion

It was concluded that there was no relationship between telogen hair loss and serum ferritin level.

## Recommendation

I recommend to do another study which include assessment of serum iron, TSH and vit.D in patients with T.E.

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