

ORIGINAL ARTICLE

Association of Serum Ferritin Levels and Alopecia in Women

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ABSTRACT:

Introduction: Women presenting with diffuse hair loss is a very common and challenging problem for dermatologists. The relationship between body iron status and different types of hair loss has been investigated in a number of studies, however, with relatively discrepant findings.

Aim: To evaluate whether chronic hair loss (CTE) in females are associated with decreased iron stores as measured by serum ferritin levels.

Material and methods: A sample size of 50 females aged between 15 and 45 years, having CTE and pattered hair loss, were included in our study. A detailed history was taken and dermatological, systemic examination was carried out. Diagnosis of CTE and Female pattern hair loss (FPHL) was made on clinical examination and by performing hair-pull test. The FPHL was graded using Ludwig's scale (Ludwig patterns I-III). Serum ferritin levels of the study participants were also measured.

Results: mean age of women in the study population was 38.21 years. Hair-pull test was positive in all participants with CTE but it was negative in all women with FPHL. Mean ferritin level of the whole study population was 19.4 µg/l. Mean serum ferritin levels in women with CTE came to be 15.4 µg/l. while Mean serum ferritin levels in women with FPHL came to be 32.32 µg/l. 80% (N=36) of women with CTE had serum ferritin levels <41 µg/L while 40 % (N=4) cases of FPHL had serum ferritin levels <41 µg/L.

Conclusion: We demonstrated that association exists between hair loss and ID in the participants of this study. Further scientific studies are required with larger sample size to postulate quantitative association between different etiological factors and hair loss in iron deficient female.

Key words: alopecia, Chronic diffuse hair loss, serum ferritin levels, female pattern hair loss

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INTRODUCTION:

Women presenting with diffuse hair loss is a very common and challenging problem for dermatologists.¹ The condition has several causes. Telogen effluvium (TE) is the most common cause, followed by female pattern hair loss (FPHL) and chronic telogen effluvium (CTE); the rest of the causes are not so common and can be relatively easily diagnosed through history and examination

TE along with female pattern hair loss (FPHL) and chronic TE (CTE) accounts for the majority of diffuse alopecia cases.² Abrupt, rapid, generalized shedding of normal club hairs, 2-3 months after a triggering event, indicates TE while gradual diffuse hair loss with thinning of central scalp/widening of central parting line/frontotemporal recession indicates FPHL. Excessive, alarming diffuse shedding, coming from a normal looking head with plenty of hairs and without an obvious cause, is the hallmark of CTE.³

TE, or hair shedding, results from the synchronous transition of hair follicles from the growing stage of the hair cycle (anagen) to the resting stage of the hair cycle (telogen). Acute TE or classical TE is a self-limiting condition lasting for about 3-6 months; however, if the stimulus/event that causes diffuse shedding persists beyond six months, then the

condition becomes chronic. CTE is chronic diffuse loss persisting beyond six months, may be primary/idiopathic, or it may be secondary to some underlying disease.

The common causes of chronic hair loss in females include thyroid disorders, diabetes, polycystic ovarian disease, anemia, and hypoproteinemia. Other causes are stress, drugs, pregnancy, malignancies, chemotherapy, etc. In most cases, the diagnosis can be made clinically and the condition treated medically.³

The most common causes of iron deficiency (ID) are menstrual blood loss and pregnancy in premenopausal women.⁴ A review of research shows that 72% of women with diffuse hair loss have an ID.⁵

Low iron stores have been considered a possible contributing factor. Observational data have suggested that alopecia in women may be associated with decreased body iron stores. Therefore, assessment of serum ferritin levels is generally recommended as part of the routine investigation, and dermatologists commonly prescribe iron supplementation in women under the assumption that low iron stores may cause hair loss. It is not until recently that the significance of iron stores as assessed by serum ferritin levels in women with hair loss has been systematically studied.⁶

The relationship between body iron status and different types of hair loss has been investigated in a number of studies, however, with relatively discrepant findings. Therefore, in the present study we aimed to evaluate whether chronic hair loss (CTE) in females are associated with decreased iron stores as measured by serum ferritin levels.

MATERIAL AND METHODS:

The present cross sectional study was conducted in the Department of Skin & V.D., Subharti Medical College Meerut, Uttar Pradesh, India. A sample size of 50 females was selected. All female patients aged between 15 and 45 years, having CTE and pattering hair loss, were included in our study. Whereas females who did not give consent, who were on iron therapy, undergone gastrointestinal/scalp surgeries, suffering from trichotillomania, hormonal abnormalities, and who were on medications for systemic disorders were excluded from our study. Ethical clearance was obtained from institutional ethical committee. An informed and written consent was obtained from each participant.

A thorough physical and clinical examination of each participant was carried out for each patient included in our study group. A detailed history was taken and dermatological, systemic examination was carried out. Diagnosis of CTE and Female pattern hair loss (FPHL) was made on clinical examination and by performing hair-pull test. The FPHL was graded using

Ludwig's scale (Ludwig patterns I-III). The grading was as follows: Grade I: (Mild) Hair loss occurs on the top and front of the scalp, more noticeable when the hair is parted down the center of the scalp; Grade II: (Moderate) Thinning, shedding, general decrease in volume, and a center part that continues to widen over time; Grade III: (Severe) Here, hair is so thin that it has difficulty camouflaging the scalp, rendering it visible to the naked eye. Serum ferritin levels of the study participants were also measured.

RESULTS:

This study included 50 female patients suffering from CTE (40 patients) and FPHL (10 patients). The mean age of women in the study population was 38.21 years (range: 15-45 years). Mean age of patients with CTE came to be 28.14 years while mean age of patients with FPHL came to be 41.25 years.

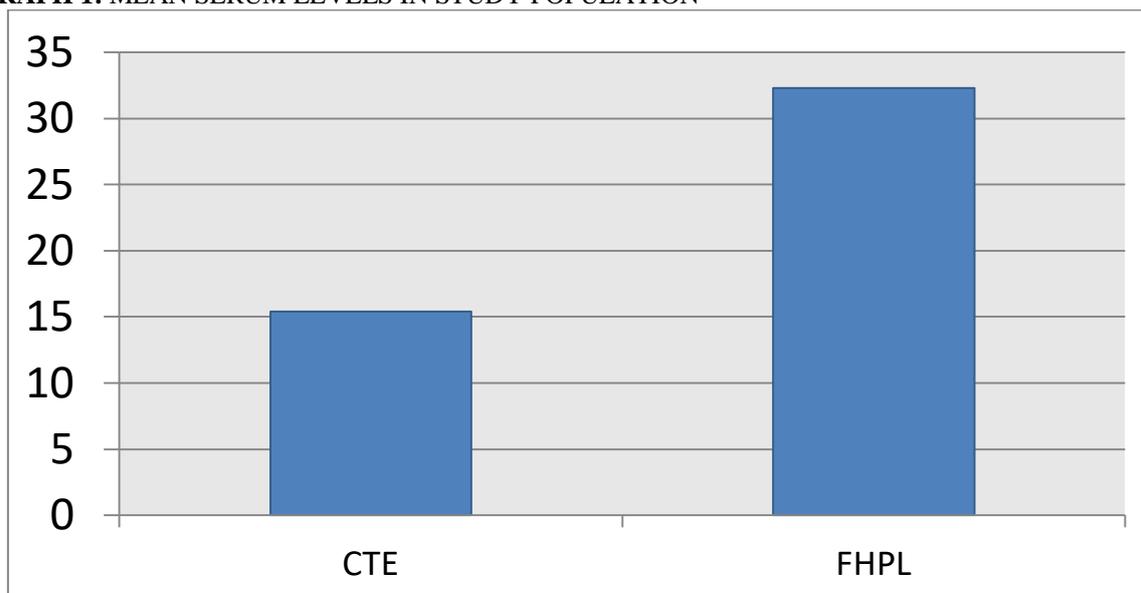
Hair-pull test was positive in all participants with CTE but it was negative in all women with FPHL. When Severity of hair loss in FPHL was assessed using Ludwig's scale, it was observed that 70% (n=35) participants had Grade II hair loss and 30% (n=25) of participants had Grade III hair loss.

Mean ferritin level of the whole study population was 19.4 µg/l. Mean serum ferritin levels in women with CTE came to be 15.4 µg/l. while Mean serum ferritin levels in women with FPHL came to be 32.32 µg/l. On the difference was statistically between the values were found to be statistically also significant (p<0.05)

TABLE1 : MEAN SERUM LEVELS IN STUDY POPULATION

MEAN SERUM FERRITIN LEVELS	CTE	FHPL
	15.4 µg/l	32.3 µg/l.
P VALUE	<0.05*	

GRAPH 1: MEAN SERUM LEVELS IN STUDY POPULATION



We used a cutoff of value of 41 µg/L for serum ferritin as at this cutoff specificity is best as mentioned in literature². Hence it was seen that 80% (N=36) of women with CTE had serum ferritin levels <41 µg/L while 40 % (N=4) cases of FPHL had serum ferritin levels <41 µg/L.

DISCUSSION:

Iron deficiency represents the most common nutritional deficiency with a prevalence of 12–16% in adolescent girls and women of childbearing age (16–49 years of age) and 6–9% in women 50 years of age and older in the USA⁷. We evaluated the relationship between serum ferritin levels and hair loss activity in our study.

Mean serum ferritin levels of our study was 19.4 µg/l, which is low as compared to the studies conducted by Bregy and Trueb who reported Mean serum ferritin levels of 53.14 µg/L in their study.⁸

Kantor et al.⁹ found in their androgenetic alopecia (or FPHL) and TE groups mean serum ferritin concentrations of 37.3 and 50.1 g/l, respectively, versus 59.5 g/l in controls. In patients with FPHL or TE who were <40 years of age, mean serum ferritin concentrations were 15.0 and 23.8 g/l, respectively, versus 62.3 g/l in controls.

Mean serum ferritin level of our study for CTE patients came to be 15.4 µg/l. Mean serum ferritin levels in the studies conducted by Bregy and Trueb (40.09 µg/L), and Olsen et al (51.81 µg/L) in case of CTE were found to be higher, as compared to our study.^{8,10}

Our results agree with previous reports demonstrating the association between low iron stores assessed by serum ferritin concentrations and hair loss in women.^{9,11,12} On the other hand, other studies found no significant link between iron deficiency and hair loss.^{10,13}

Variations in laboratory values of serum ferritin concentrations of 10–15 µg/L have been observed, while it is observed that a cutoff of 41 µg/L yields a sensitivity of 98% and a specificity of 98%. Serum ferritin levels above 70 µg/L are considered as normal. Hence, same criteria were also used in this study.

Kantor et al. The data presented herein show no correlation between hair loss activity and serum ferritin levels > 10 g/l in otherwise healthy women with FPHL, TE, or a combination of both.⁹ Therefore, it remains debatable whether therapeutic iron supplementation in these women is useful. Bregy A et al⁸ concluded that the role of tissue iron status in female hair loss has probably been overestimated since we found that a majority (61.9%) of women with hair loss due to FPHL, TE, or a combination of both have serum ferritin levels above the cutoff point with 92% sensitivity. Sinclair et al¹⁴ also found that only 12/194 (6.2%) of women with alopecia had serum ferritin levels < 20 g/l, and Aydingoz et al¹⁵ found no significant difference in the prevalence of depleted iron stores found in total subjects with diffuse or female pattern alopecia versus controls (32.5 vs. 45.6%).

CONCLUSION:

Hence, we demonstrate that association exists between hair loss and ID in the participants of this study. Further scientific studies are required with

larger sample size to postulate quantitative association between different etiological factors and hair loss in iron deficient female.

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