

Telogen Effluvium: Potential causes in Iraq

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Abstract :

Background: Telogen Effluvium (TE) among women is a challenging common problem for Dermatologists and data on its prevalence among Iraqi women is limited hair loss is a distressing problem for women because femininity and attractiveness is linked to women's hair.

Aim of study: To find out the main risk factors of Telogen Effluvium among women in Thi-Qar Province (Iraq). Some of these risk factors are investigated before in Iraq but not in Thi-Qar province such as TSH while others such as Vitamin D are barely investigated in Iraq.

Patients and methods: A descriptive cross sectional study carried out in Dermatology Outpatient Clinic of Al-Hussein Teaching Hospital, Nassiriah City (Thi-Qar Province Center), Iraq through the period from 1st of March, 2014 to the end of June, 2015 on random sample of 100 women with Telogen Effluvium and convenient sample of 100 healthy controls. Thyroid stimulating hormone, serum Ferritin and Vitamin D₃ levels of both groups were measured.

Results: There was a significant association between positive family history of hair loss and women with Telogen Effluvium ($p < 0.001$). No significant difference in thyroid stimulating hormone level was observed between cases and controls ($p = 0.6$). There was a significantly lower serum Ferritin and Vitamin D₃ levels among women with Telogen Effluvium ($p < 0.05$).

Conclusion: Low serum Ferritin and Vitamin D₃ levels among women might play a major role in etiology of Telogen Effluvium.

Keywords: Hair loss, Telogen Effluvium, Thyroid Stimulating Hormone, Serum Ferritin, Vitamin D₃.

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 countries¹. The most frequent causes of hair loss are Telogen Effluvium (TE) and female pattern hair loss (FPHL)². TE (acute and chronic) is developed by shift of high number of Anagen hairs to

Telogen hairs on scalp (the Anagen / Telogen Ratio) changes from 90/10 to 70/30) and in general, the main risk factors of TE are major illness, stress, nutritional deficiencies and medications³. FPHL (familial disease) had an androgen and genetics basis in its etiology⁴.

Iron deficiency anemia is the most prevalent nutritional risk factor that faces the dermatologists in daily clinical practice⁵. A serum Ferritin level is used for hair loss assessment and iron supplement is used routinely for hair loss treatment. In spite of this, other authors failed to prove that the iron has an effect on hair loss⁶. Many observational studies have found the association between decreased Ferritin levels and hair loss⁷⁻¹⁰. The Ferritin is an acute-phase reactant and elevated as a result of many inflammatory diseases, therefore, a normal C-reactive protein (CRP) is useful to exclude elevated Ferritin caused by acute-phase reactions¹¹.

Vitamin D has a novel role in calcium regulation and bone metabolism and 1, 25-dihydroxyvitamin D₃ [1, 25(OH)₂ D₃] affects other important physiological effects, as immunoregulation and protection against UV radiation, infectious agents, oxidative stress, and cancer¹². Vitamin D activates hair follicle differentiation, without affecting proliferation. It was shown that the patients with hereditary vitamin D receptor (VDR) deficiency have a high probability of developing alopecia¹³. Early onset type of FPHL among females has a stronger family history

of male family members with significant male pattern baldness. Those women are more likely than those with late onset FPHL to have a history of hirsutism, adult acne that is persistent, or irregular periods and all potential signs of either androgen excess or androgen hypersensitivity. Late onsets FPHL among females had less androgen excess features and their blood androgen levels related to menopause with uncertain etiology of hair loss¹⁴.

Literatures on TE among Iraqi women are scarce although it's medical, aesthetic and social impact. Consequently, our study aimed to find out the main risk factors of TE among women in Thi-Qar Province (Iraq).

Patients and Methods

A descriptive cross sectional study carried out in Dermatology Outpatient Clinic of Al-Hussein Teaching Hospital, Nassiriah City (Thi-Qar Province Center), Iraq through the period from 1st of March, 2014 to end of June, 2015. The sample size of the study was calculated by the equation (Sample size= $Z_{1-\alpha/2}^2 P (1-P)/d^2$)¹⁵ with previous proportion extracted by a pilot study. The controls were selected with a case control ratio as 1:1. The study enrolled 15 to 50 year old women who were in generally good health, complained of self-perceived diffuse hair loss of at least one hundred hairs a day for at least six months. Women who were excluded were those with patchy hair loss, scarring hair loss, central scalp hair loss, frontal accentuation (female pattern hair loss), negative hair-pull test; a history of

using hair dye, perm or straightener within the last six months; women who were going on diet for the previous six months; women who had started taking drugs that affect hair cycles such as chemotherapy or hormonal therapy for birth control and infertility for the last six months; women with a pre-existing thyroid diseases or autoimmune diseases; women who were or had been pregnant or nursing within the previous one year; women currently taking iron or Vitamin D supplements (prior supplements is not an exclusion criterion). A sample of 100 women with TE was collected by systematic random sampling and a convenient sample of 100 healthy controls who presented to the same Dermatology Clinic for another complain such as wart, psoriasis, etc., and who were agreed to participate. Diagnosis of TE was done by researcher and based on the chief complain of self-perceived hair loss of at least one hundred hairs a day for at least six months in addition to the examination of scalp and performing a

hair-pull test. Questionnaire designing was based on previous literatures^{1, 2}. The investigations (TSH, 1, 25(OH)₂D₃ and Ferritin) were done in laboratory of the hospital.

The study was approved by health authority in of Al-Hussein Teaching Hospital. All patients' data were entered using computerized statistical software; Statistical Package for Social Sciences (SPSS) version 21. Kolmogorov Smirnov analysis verified the normality of the data set. Descriptive statistics presented as (mean \pm standard deviation) and frequencies as percentages. Multiple contingency tables conducted and appropriate statistical tests performed, Chi-square used for categorical variables and Independent Samples t-test was used to compare between two means. Partial correlation test was used to assess the relationship between variables after controlling one variable. In all statistical analysis, level of significance (p value) set at ≤ 0.05 and the result presented as tables and/or graphs.

Results

A total of one hundred women having TE were included with mean age as 28.6 ± 8.1 years. No significant difference in age was observed between women with TE and controls ($p=0.3$). 63% of studied women with TE had a positive family history of the hair loss and 27% of healthy controls had a positive family history of hair loss. There was a significant association between positive family history of hair loss and women with TE ($p<0.001$). All these findings were shown in table 1 and figure 1.

Table 1: Age and Family History for patients with TE and Healthy Controls.

Variable	TE	No TE	P
	No. (%)	No. (%)	
Age			
<20 years	8 (8.0)	8(8.0)	0.08
20-29 years	53 (53.0)	37 (37.0)	
30-39 years	25 (25.0)	41 (41.0)	
≥ 40 years	14 (14.0)	14(14.0)	
Total	100 (100.0)	100 (100.0)	
Mean±SD (years)	28.6±8.1	29.6±9.4	0.3
Family history			
Positive	63 (63.0)	27 (27.0)	<0.001
Negative	37 (37.0)	73 (73.0)	
Total	100 (100.0)	100 (100.0)	

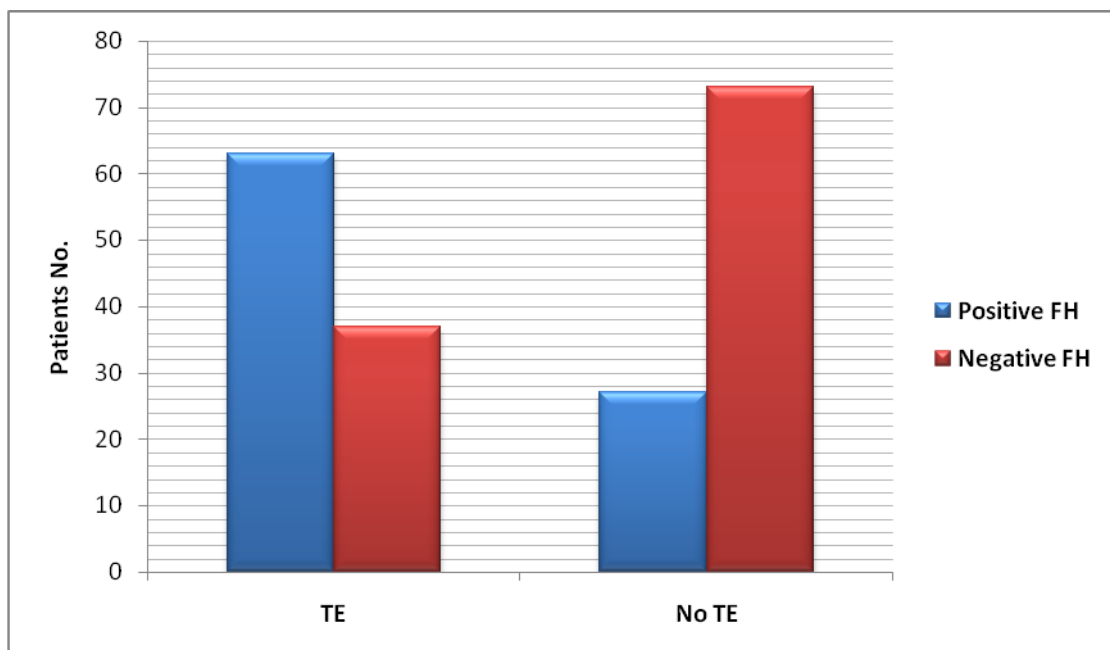


Figure 1: Family History (FH) of hair Loss Distribution according to Study Groups.

No significant effect of TSH on hair loss in patients with TE was detected in present study ($p=0.6$). There was a statistically significant low Vitamin D₃ level among women with TE ($p<0.001$). A significant association was observed between low serum Ferritin and women with TE ($p=0.01$). All these findings were shown in table 2 and figure 2.

Table 2: Distribution of Investigation Results according to Patients with TE and Healthy Controls.

Investigations	TE	No TE	P
	Mean±SD	Mean±SD	
TSH (μU/ml)	1.9±1.5	2±1.1	0.6
Vitamin D ₃ (pg/ml)	7.4±4.9	18.2±12.4	<0.001
Serum Ferritin (ng/ml)	46.1±37.5	66.7±73.8	0.01

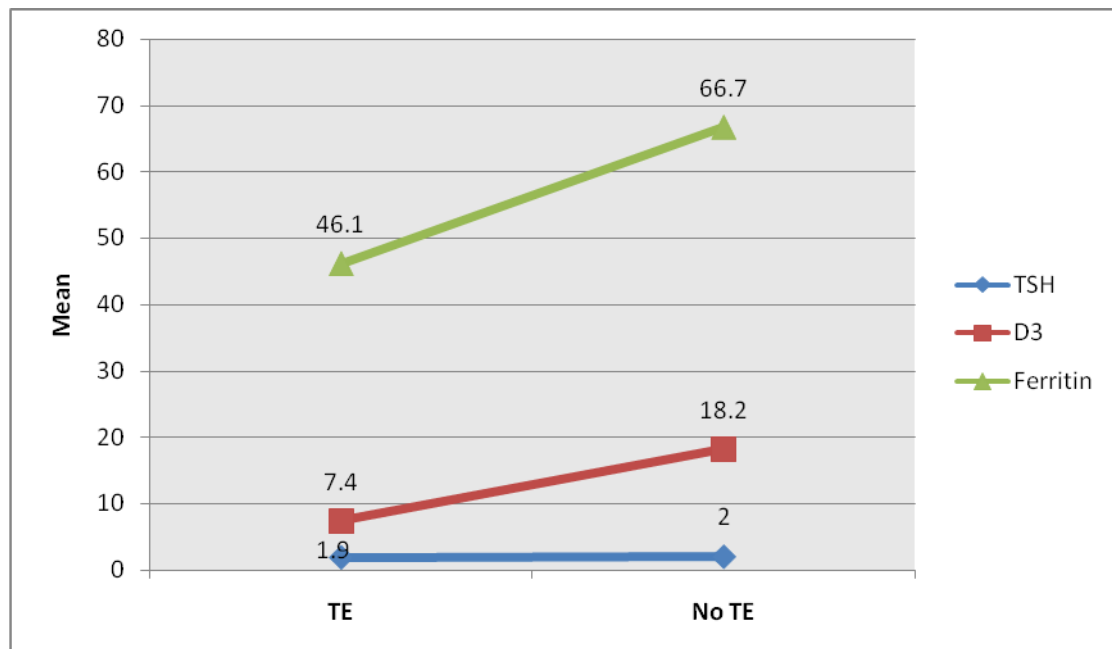


Figure 2: TSH, D₃ and Ferritin according to Cases and Controls.

After controlling family history of hair loss, a significant negative correlation was observed between Vitamin D₃ level and TE (p<0.001). In same way, there was a significant negative correlation between serum Ferritin and TE among studied women (p<0.001) as shown in table 3.

Table 3: Partial correlation of serum Ferritin and Vitamin D₃ levels with TE after controlling family history.

Variables	R	DF	P
Ferritin (ng/ml)	-3.0	197	<0.001
Vitamin D ₃ (pg/ml)	-5.0	197	<0.001

R=Correlation Coefficient, DF=Degree of Freedom.

Discussion

Hair loss is a prevalent problem among both sexes of all ages. The TE is a common cause of diffuse non-scarring alopecia¹⁶. TE hair loss is a multifactorial in origin; nutritional, medications, fever, rapid weight loss, etc¹⁷. Positive family history of hair loss in this study was significantly higher among women with TE than controls. This is similar to results of França et al study which reported that family history may play role in TE hair loss¹⁸. The family history is highly prevalent among female having a female pattern hair loss type that was excluded in current study. In present stud, a family history effect was controlled to reveal the significant effect of Ferritin and Vitamin D₃ level on TE. Serum Ferritin of studied women with TE in current study was

significantly lower than controls which coincide with

many previous literatures^{1, 19}. Iron deficiency is associated with low serum Ferritin concentrations and low serum Ferritin level is predictor for iron deficiency²⁰. The causes of Telogen hair shedding in iron deficiency anemia is not fully understood but might be due to a fact that hair follicle matrix cells as the most rapidly proliferating cells in the body appear to have lower levels of Ferritin and higher levels of free iron²¹. Elledge et al study stated that iron importance for hair originated from its requirement as a cofactor for Ribonucleotide Reductase, the rate-limiting enzyme for DNA synthesis. Therefore, iron deficiency inhibits this

enzyme, resulting in inhibition of hair proliferation²². Another associated problem with anemia is Zinc deficiency and a previous study reported the effect of Zinc deficiency on hair loss¹⁷. However, effect of iron on TE is still controversial. Sinclair study found no effect of iron as a replacement therapy for TE⁹.

In present study vitamin D₃ level was significantly low among women with TE. This finding is consistent with results of Rasheed et al study² and Amor K, et al study²³. Vitamin D is necessary to delay aging phenomena, including hair loss²²; in addition to an important role in the hair follicle cycle, specifically Anagen initiation²⁴ and regulation of genes expression required for hair follicle cycling, including the hedgehog signaling pathway²⁵. This finding regarding Vitamin D₃ is inconsistent with results of Karadağ et al study which found higher Vitamin D₃ level among hair loss women with no acceptable explanation⁵.

Thyroid stimulating hormone level of women with TE was not significantly different from TSH level of controls. This finding agreed with results of Moeinvaziri et al study¹. This was not in agreement with Vincent et al study which reported the importance of TSH for assessment of hair loss among women.

The limitations of present study were its cross sectional design that failed to assess the temporal relationship, concentrating the work in one center so that the study cannot be generalized on Iraqi women and confounding effect of other variables lowering serum Ferritin and Vitamin D₃ levels that were not

excluded in present study. Besides, this study did not investigate other risk factors of TE such as Zinc deficiency, proteins deficiency, etc.

In conclusion, Present study revealed that decreased serum Ferritin and Vitamin D₃ among women might play a major role in TE hair loss. There is a demand for universal screening of serum Ferritin and Vitamin D₃ not only for women presented with TE but also for women and men presented with other dermatological diseases such as psoriasis, skin cancer, etc., in which Vitamin D and iron might play a role. Further national large sized studies on risk factors of TE are needed.

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تساقط الشعر : الاسباب المحتملة في العراق

علاء عبدالحسن نايف

الخلاصة

الخلفية: يعتبر تساقط الشعر لدى النساء مشكلة شائعة وتعتبر تحدياً للعديد من اخصائيي الامراض الجلديه. لا احد يعرف على وجه الدقة مدى انتشارها في العراق. كما ان تساقط الشعر هو من المشاكل المؤرقة لدى النساء لارتباط الشعر بالصورة النمطية للانوثه والجاذبيه.

هدف الدراسة: لمعرفة الاسباب الرئيسيه لتساقط الشعر لدى النساء في محافظة ذي قار. بعض من هذه الاسباب تم التطرق لها مسبقا ولكن في مناطق اخرى من العراق غير محافظة ذي قار والبعض الاخر لم يتم التطرق لها من قبل او نادرا ماتم التطرق لها مثل فيتامين دال.

المرضى والطرق: تم اجراء دراسة مسحية على المرضى الوافدين الى استشارية الامراض الجلديه في مستشفى الحسين التعليمي في محافظة ذي قار خلال الفتره من اذار ٢٠١٤ الى نهاية شهر تموز ٢٠١٥. الدراسه تمت على عينه عشوائيه مكونه من مئة امراه تعاني من تساقط الشعر وعينه اخرى مكونه من مئة امراه سليمه لغرض المقارنه. تم قياس الهرمون المحفز للغده الدرقيه ومخزون الحديد اضافة الى فيتامين دال لدى كلا العينيتين.

النتائج: هناك ارتباط وثيق بين تساقط الشعر والتاريخ العائلي لتساقط الشعر. ليس هناك علاقه تذكر بين مستوى الهرمون المحفز للغده الدرقيه وتساقط الشعر لدى النساء. كما اننا وجدنا مستويات منخفضه من مخزون الحديد وفيتامين دال في دم النساء التي تعاني من تساقط الشعر.

من الممكن ان يكون لمستوى مخزون الحديد ومستوى فيتامين دال في الدم دور مهم في تساقط الشعر لدى النساء في محافظة ذي قار.

الكلمات المفتاحية: تساقط الشعر، فيتامين دال، مخزون الحديد، هرمون الغدة الدرقيه المحفز.