

Prevalence of Anemia, Iron Deficiency and Abnormal Thyroid Function in Diffuse Hair Loss in Adult Women

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ABSTRACT

Introduction: The exact etiopathogenesis of disorders of diffuse hair loss in adult women is poorly understood. Several studies have revealed a high prevalence of anemia, low serum iron and thyroid disorders in patients with alopecia. The present study is undertaken to critically evaluate these associations

Aims and objectives: To evaluate the prevalence of anemia, low serum iron and thyroid disorders in adult women in the age group of 15 -45 years, presenting with non scarring diffuse hair loss.

Materials and Methods: This was case-control study carried out on patients in the skin OPD of a tertiary-level urban hospital, wherein 200 consecutive women who attended the skin OPD with the complaints of diffuse loss of hair from the scalp. Fifty age matched healthy women were selected as a control group. All patients and control groups underwent laboratory screening including CBC, urine for routine and microscopic examination, serum ferritin and thyroid function screening (TSH).

Results: The number of patients who recorded a serum ferritin label of less than 10 ng/mL (normal range 10-126 ng/mL) were 48 (68.57%), 30 (65.21), 45(63.38%), 1 (100%), nil (%), 6 (55.54%), 130 (65%) and 63 (63%) for FPHL, TE, CTE, AA, Anagen effluvium, CTE / FPHL, Total patients and Control group respectively. The number of patients who recorded a hemoglobin level of less than 12 gm were 22 (31.42)%, in FPHL, 18 (39.13)% in TE, 30 (42.25%) in CTE, 1 (100%) in Anagen effluvium, 4 (36.36%) in CTE / FPHL, 78 (39%) in Total patients and 48(48%) in Control group. Abnormal thyroid functions were recorded in 6 (8.57%), 5 (8.86%), 11 (15.49%), 1 (100%), Nil (0%), Nil 0(%), 23 (11.50%), 4 (4%) cases of FPHL, TE, CME, AA, Anagen effluvium, CTE / FPHL, Total patients and Control group respectively.

Conclusion: There were significant differences between cases and control groups regarding prevalence of abnormal thyroid function (TSH), however no significant difference in prevalence was noted in the prevalence of anemia and iron deficiency in cases and control groups. Based on our observations, we recommend that all patients coming with alopecia should be screened for abnormal thyroid functions.

Key words: Anemia, iron deficiency, abnormal thyroid function, diffuse hair loss.

INTRODUCTION

Women presenting with diffuse hair loss is a very common and challenging problem for dermatologists. Anemia,

especially iron-deficiency anemia, and thyroid hormone disorders are the two common conditions often associated with diffuse hair loss, and most of the time, there

are no apparent clinical features to suggest them, so these must be investigated in all cases of diffuse hair loss in women. Furthermore there are conflicting reports of association between iron deficiency and hair loss. Some suggest a definitive association, while others deny it. This further necessitate the need for investigation The purpose of this study was to find out the prevalence of anemia, iron deficiency and thyroid abnormalities in chronic diffuse hair loss in women of reproductive age group (15–45 years) and to present an overview on the subject

MATERIALS AND METHODS

This was case-control study carried out on patients in the skin OPD of a tertiary-level urban hospital wherein 200 consecutive women who attended the skin OPD with the complaints of loss of hair from the scalp were classified into various types of non-scarring diffuse hair loss based on their distinguishing features. [1] Cases of congenital alopecia and cicatricial alopecia were excluded from the study. Fifty age matched healthy women were selected as a control group. All patients and control groups underwent laboratory screening including CBC, urine for routine and microscopic examination, serum ferritin and thyroid function screening (TSH). Biopsy was undertaken only in rare cases when the clinical diagnosis was in doubt and the patient consented for it. Serum ferritin is an early and specific marker for iron deficiency (ID), so it is used for detecting ID. Thyroid stimulating hormone (TSH) was used to

screen patients and control group for abnormal thyroid function.

RESULTS

The results of the study are summarized in Table 1. Out of the total 200 patients, 70 were diagnosed as FPHL, 71 as CTE, 46 as TE, 11 as CTE / FPHL, 1 alopecia areata (AA) and 1 as anagen effluvium.. The mean age of the subjects was 35, 28, 31, 25, 40, 32, 31.5 AND 31 years for FPHL, TE, CME, AA, Anagen effluvium, CTE / FPHL, Total patients and Control group respectively. The number of patients who recorded a serum ferritin label of less than 10 ng/mL (normal range 10–126 ng/mL) were 48 (68.57%), 30 (65.21), 45(63.38%), 1 (100%), nil (%), 6 (55.54%), 130 (65%) and 63 (63%) for FPHL, TE, CTE, AA, Anagen effluvium, CTE / FPHL, Total patients and Control group respectively. The number of patients who recorded a hemoglobin level of less than 12 gm were 22 (31.42)%, in FPHL, 18 (39.13)% in TE, 30 (42.25%) in CTE, 1 (100%) in Anagen effluvium, 4 (36.36%) in CTE / FPHL, 78 (39%) in Total patients and 48(48%) in Control group. Abnormal thyroid functions were recorded in 6 (8.57%), 5 (8.86%), 11 (15.49%), 1 (100%), Nil (0%), Nil 0(%), 23 (11.50%), 4 (4%) cases of FPHL, TE, CME, AA, Anagen effluvium, CTE / FPHL, Total patients and Control group respectively. Out of these 23 patients with abnormal thyroid function test, 21 were having hypothyroidism. So, hypothyroidism alone accounted for 10.5% of total cases.

Table1. Types of diffuse hair loss and their relation with Hb, S ferritin and Thyroid disorders

Type of hair loss	Mean age of pts in yrs	Number of pts with Hb < 12gm (with %)	Number of pts with S ferritin <10 ng / ml (with %)	Number of pts with abnormal thyroid function (with %0)
FPHL(n=70)	35	22 (31.42)%	48 (68.57%)	6 (8.57%)
TE (n=46)	28	18 (39.13)%	30 (65.21%)	5 (8.86%)
CTE (n=71)	31	30 (42.25%)	45(63.38%)	11 (15.49%)
AA (n=1)	25	1 (100%)	1 (100%)	1 (100%)
Anagen effluvium (n=1)	40	Nil	Nil	Nil
CTE /FPHL (11)	32	4 (36.36%)	6 (55.54%)	Nil
Total pts (n= 200)	31.5	78 (39%)	130 (65%)	23 (11.50%)
Control group	31	48(48%)	63 (63%)	4 (4%)

FPHL (female pattern hair loss), TE (telogen effluvium), CTE (chronic telogen effluvium), AA (anagen effluvium),

DISCUSSION

CTE, FPHL and TE are the most common causes of non-scarring alopecia in women. Together they account for most of the cases of diffuse hair loss. [1-4] In this study also, these three entities accounted for 93.5% (187/200) of total cases. Anemia, especially iron-deficiency anemia, and thyroid hormone disorders are the two common conditions often associated with diffuse hair loss, and most of the time, there are no apparent clinical features to suggest them, so these must be investigated in all cases of diffuse hair loss in women. [5] The percentage of patients with serum ferritin of less than 12gm in case group was found to be lower than in the control group (Table 1). This is in variance with another study in which anemia was mentioned as a cause for diffuse loss. [5] Similarly the percentage of patients with serum ferritin of less than 10 ng/mL in case group 130 (65%) and control group 63 (63%) also did not reveal any significant differences. These findings regarding serum iron are more or less similar with the findings of Oleson et al, [6] who concluded that there was no statistically significant increase in the incidence of iron deficiency in women with FPHL or CTE versus control subjects. Similar inferences were drawn in other studies. [7-9] However there are studies which concluded that low serum ferritin/iron deficiency is strongly associated with hair loss. [10-12] The relationship between non-scarring scalp alopecia in women and iron deficiency continues to be a subject of debate, [5,13] and the differences in various studies may be due to different study designs, absence of randomized controlled protocols, studies with smaller number of patients, etc.

There were significant differences between cases and controls regarding prevalence of abnormal thyroid function (TSH). A high prevalence of abnormal thyroid function (11.50%) was recorded in the study. This when compared with the prevalence in the control group (4%), as well as in the general population [14] was

quite significant, making it mandatory to investigate thyroid function test in all cases of diffuse hair loss in adult women. [5]

CONCLUSION

The study did not find any association between hemoglobin, low serum ferritin (iron deficiency) and chronic diffuse hair loss in women of reproductive age group. Abnormal thyroid functions (23/200, 11.50%) were noted in a significant number of cases of diffuse hair loss (23/200, 11.50%), making it mandatory to investigate them in all cases of diffuse hair loss.

REFERENCES

1. Shrivastava SB. Diffuse hair loss in adult female: Approach to diagnosis and management. *Indian J Dermatol Venereol Leprol* 2009; 75: 20-28.
2. Sinclair RD, Banfield CC, Dawber RP. Diffuse hair loss. In: Sinclair RD, Banfield CC, Dawber RP, editors. *Handbook of Diseases of the Hair and Scalp*. UK: Blackwell Science Ltd 1999; 64-74.
3. Rustom A, Pasricha JS. Causes of diffuse alopecia in women. *Indian J Dermatol Venereol Leprol* 1994; 60: 266-71.
4. Jain VK, Kataria U, Dayal S. Study of diffuse alopecia in females. *Indian J Dermatol Venereol Leprol* 2000; 66: 65-68
5. Trost LB, Bergfeld WF, Calogeras E. The diagnosis and treatment of iron deficiency and its potential relationship to hair loss. *J Am Acad Dermatol* 2006; 54: 824-44.
6. Olsen EA, Reed KB, Cacchio PB et al. Iron deficiency in female pattern hair loss, chronic telogen effluvium, and control groups. *J Am Acad Dermatol* 2010; 63(6): 991-99.
7. Sinclair R. There is no clear association between low serum ferritin and chronic diffuse telogen hair loss. *Br J Dermatol* 2002; 147: 982-84.
8. Bregy A, Trueb RM. No association between serum ferritin levels >10 microg/l and hair loss activity in women. *Dermatology* 2008; 217: 1-6.
9. Gonul M, Cakmak SK, Soyulu S et al. Serum vitamin B12, folate, ferritin, and iron levels in Turkish patients with alopecia areata. *Indian J Dermatol Venereol Leprol* 2009; 75: 552.

10. Moeinvaziri M, Mansoori P, Holakooee K et al. Iron status in diffuse telogen hair loss among women. *Acta Dermatovenerol Croat* 2009; 17: 279-84.
11. Deloche C, Bastien P, Chadoutaud S et al. Low iron stores: A risk factor for excessive hair loss in non-menopausal women. *Eur J Dermatol* 2007; 17: 507-12.
12. Kantor J, Kessler LJ, Brooks DG et al. Decreased serum ferritin is associated with alopecia in women. *J Invest Dermatol* 2003; 121: 985-88.
13. St Pierre SA, Vercellotti GM, Donovan JC et al. Iron deficiency and diffuse nonscarring scalp alopecia in women: more pieces to the puzzle. *J Am Acad Dermatol* 2010; 63(6): 1070-76.
14. A Garmendia Madariaga et al The Incidence and Prevalence of Thyroid Dysfunction in Europe: A Meta-Analysis *The Journal of Clinical Endocrinology & Metabolism*, Volume 99, Issue 3, 1 March 2014, Pages 923–931

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