

A Study of Non Cicatrical Diffuse Hair Loss in Female at Tertiary Care Center

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Abstract:

Introduction: Hair loss is a common concern for women, affecting their self-esteem and quality of life. Understanding the factors behind non-cicatrical diffuse hair loss is crucial for effective management.**Materials and Methods:** In this study, we examined 50 female participants with hair loss. We collected data on Demographics, Medical history, and conducted various investigations to analyze potential contributing factors. This helped us gain insights into the patterns and causes of non-cicatrical diffuse hair loss in females.**Results:** The study included 50 participants with non-cicatrical diffuse hair loss. Most were in the 18-25 age group (52%), with various occupations. Hair fall was the predominant complaint (100%), with itching (32%), visible thinning (24%), and lack of volume (18%) also noted. Hair loss duration varied, with 54% experiencing it for less than 6 months. Medical history revealed factors like diabetes (4%), thyroid dysfunction (8%), and stress (14%). Laboratory findings indicated abnormal Hb levels (38%) and low Vitamin B12 (18%). Daily hair loss ranged from 300 to 600 hairs. Diagnoses included Chronic Telogen Effluvium (42%), Acute Telogen Effluvium (28%), and Female Pattern Hair Loss (30%).**Conclusion:** Non-cicatrical diffuse hair loss affects women across ages. Factors like hormonal imbalances, nutrition, genetics, and environment contribute. Our study highlights varied patterns, including Chronic Telogen Effluvium, Acute Telogen Effluvium, and Female Pattern Hair Loss. Addressing factors like anemia, thyroid dysfunction, and nutritional deficiencies is crucial for effective management.**Key words:** Female hair loss, Non-cicatrical diffuse, Contributing factors.

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Introduction

Hair loss, scientifically termed alopecia, is far more than a mere medical anomaly. It traverses the boundaries of age, gender, and culture, making its impact deeply resonant. [1] The threads that weave into one's sense of self-esteem, self-image, and psychological equilibrium are intricately tied to the lushness of their locks. When these threads unravel, whether gradually or abruptly, they can give rise to a profound emotional tremor that reverberates across various facets of life. Hair loss isn't merely a medical condition; it's a transformative experience that has the potential to redefine how one perceives oneself and how others perceive them. [2]

"Various factors contribute to the occurrence of Diffuse Hair Loss (DHL), including conditions like Telogen Effluvium (TE), Female Pattern Hair Loss (FPHL), Chronic Telogen Effluvium (CTE), Anagen Effluvium (AE), loose anagen hair syndrome, and the diffuse variant of Alopecia Areata (AA). [3] DHL can

be triggered by a range of causes, such as childbirth, fevers, acute or chronic illnesses, kidney disorders, chronic liver conditions, thyroid problems, deficiencies in iron and other nutrients, as well as certain medications. [4]

Non-cicatrical diffuse hair loss in women, often referred to as "telogen effluvium, [5]" represents a distinctive hair loss pattern characterized by widespread shedding across the scalp without permanent follicular damage or scarring. [6] This condition leads to a visibly thinning appearance and is associated with a temporary disruption in the natural hair growth cycle. [7] It encompasses a complex interplay of factors, including hormonal fluctuations, nutritional deficiencies, psychological stress, genetics, and environmental influences. Non-cicatrical diffuse hair loss poses a significant challenge due to its multifactorial nature and its impact on self-esteem, often necessitating a

comprehensive and holistic approach to diagnosis and management. [8]

Among the various types of hair loss, non-cicatricial diffuse hair loss in females stands out as a challenging condition that requires comprehensive understanding and management. [9] This study aims to delve into the various aspects of non-cicatricial diffuse hair loss in females, focusing on its prevalence, underlying causes, clinical presentation, and potential treatment modalities.

Material and Methods

A cross-sectional study design was employed, aiming to comprehensively elucidate the clinical and etiological facets of non-cicatricial diffuse hair loss in females. The study cohort consisted of 50 female patients, seeking care at the Department of Skin and Venereal Diseases at tertiary care center, Silvassa, DNH. These patients exhibited clinical manifestations indicative of non-cicatricial diffuse hair loss and diffuse hair thinning.

All consenting female patients aged 18 to 50 years presenting with non-cicatricial diffuse hair loss and diffuse hair thinning were included in the study. Participants who declined participation, those currently undergoing iron therapy or medications for systemic disorders, individuals with trichotillomania, alopecia areata, or anagen effluvium were excluded from the study.

Informed consent was obtained from participants, following which detailed histories were recorded. Questionnaires were employed to capture age, duration, onset, and progression of hair loss, family history, systemic ailments, and associated symptoms such as scalp itching, pain, and seborrhea. A thorough exploration of trigger factors, stressors, febrile episodes, blood loss events, hair care product usage, recent childbirth, abortions, hospitalizations, and surgeries was undertaken. Previous instances of

analogous hair loss, menstrual history, and obstetric history were documented. Additionally, Hamilton anxiety and depression scoring were administered.

A comprehensive general physical and systemic examination was conducted to identify potential abnormalities. Scalp examination involved categorizing hair loss type, hair thinning extent, temporal recession, and executing the hair pull test for all participants. Diagnoses were established based on clinical histories and observed hair loss patterns. Patients were classified into categories including Acute Telogen Effluvium, Chronic Telogen Effluvium, and Female Pattern Hair Loss (FPHL). Sub-groups were then created within the FPHL category, categorizing patients into patterns (Ludwig type, Olsen type, Hamilton type), and the Sinclair scale was employed for grading. The investigation phase encompassed key laboratory assessments to delve into potential underlying factors. Hemoglobin levels, serum ferritin, serum vitamin B12, serum vitamin D3, thyroid function tests (TSH, T3, T4), liver function tests (LFT), and renal function tests (RFT) were systematically measured.

Descriptive statistics were employed to characterize the demographic profile, clinical features, and laboratory findings of the participants with non-cicatricial diffuse hair loss. Frequencies and percentages were used for categorical variables.

Results

In the study, the demographic profile of 50 participants with DHL revealed that the majority were in the age group of 18-25 years (52%), followed by 25-30 years (32%), 31-40 years (10%), and those above 40 years (6%). In terms of occupation among the 50 subjects, the majority were housewives (34%), followed by individuals in labor roles (22%), those in government jobs (10%), participants engaged in private jobs (26%), and others (8%).

Table1: Demographic profile (n=50)

Age group (years)	Number of cases	Percentage
18-25	26	52%
25-30	16	32%
31-40	5	10%
>40	3	6%

For our study, figure 1 summarizes the presenting chief complaints among the participants. Hair fall was the predominant issue, reported by all cases (100%). Itching over the scalp was observed in 32% of cases, dandruff in 8%, visible thinning in 24%, and lack of volume in 18%. The majority of the patients experienced hair loss for less than 6 months (54%), followed by 6-12 months (28%), and more than 12 months (18%).

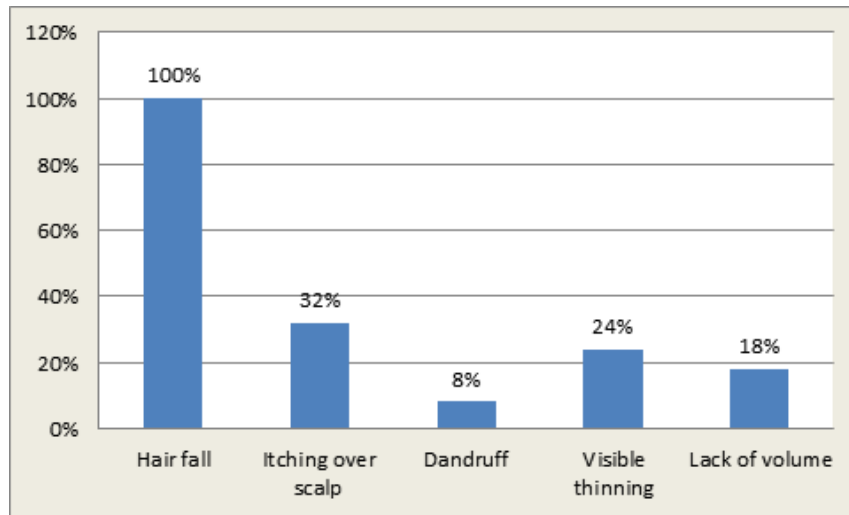


Figure 1: Presenting chief complaints

In our study, the majority (86%) had a normal menstrual history, while 14% reported an abnormal menstrual pattern. Table 2 presents the past medical history of the study participants (n=50). Diabetes Mellitus (DM) was reported by 2 individuals (4%). Thyroid dysfunction was noted in 4 subjects (8%). Febrile illnesses such as Dengue or Malaria were

observed in 3 cases (6%). A history of childbirth was recorded in 3 participants (6%). Crash dieting was reported by 11 subjects (22%). Surgery, including hysterectomy or cesarean section, was documented in 3 cases (6%). Stress, both psychological and emotional, was experienced by 7 individuals (14%).

Table 2: Past history of patients (n=50)

Past history	Number of subjects	Percentage
DM	2	4%
Thyroid dysfunction	4	8%
Febrile illness (Dengue, Malaria)	3	6%
Child birth	3	6%
Crash diet	11	22%
Surgery (Hysterectomy/Cesarean section)	3	6%
Stress (Psychological/Emotional)	7	14%

Out of the 50 participants, 38% exhibited abnormal hemoglobin levels (Hb <12g/dL), indicating potential anemia. Approximately 14% had low serum ferritin levels (<10 ng/mL), which could suggest reduced iron stores. An 8% prevalence of thyroid abnormalities was observed, possibly impacting hormonal balance. In our study, low levels of Vitamin D (<12 ng/mL) were observed in 2% of participants, while low

Vitamin B12 levels (<200 pg/mL) were recorded in 18% of cases. Conversely, 40% of subjects demonstrated normal laboratory data. This comprehensive analysis of investigations contributes to our understanding of the underlying factors contributing to non-cicatricial diffuse hair loss in the study cohort of females.

Table 3: Laboratory Investigations

Investigations	Abnormal tests (n)	Percentage(%)
Hb (<12gm%)	19	38%
Serum ferritin <10mg/ml	7	14%
Thyroid abnormality	4	8%
Low Vitamin D level (<12ng/ml)	1	2%
Low Vitamin B12 level (<below 200 pg/mL)	9	18%
Normal lab data	20	40%
Total	50	100%

In our study, a substantial portion of the female participants encountered a daily hair loss of approximately 300 hairs (30%), closely followed by

around 200 hairs (27%). Around 100 hairs lost per day was observed in 19% of patients. Hair loss of around 400 hairs daily accounted for 15%, while 7%

experienced around 50 hairs lost. A smaller percentage had around 500 hairs (4%) and around 600 hairs (2%) lost daily.

Table 4 outlines the diagnosis distribution among the subjects (n=50). Chronic Telogen Effluvium (CTE) was the most prevalent diagnosis, affecting 42% of

participants. Acute Telogen Effluvium (ATE) accounted for 28%, while Female Pattern Hair Loss (FPHL) was diagnosed in 30% of cases. Variants of FPHL, including Male Type, Olsen Type, and various grade levels (II-V), collectively represented smaller percentages of the diagnoses.

Table 4: Diagnosis of the subjects (n=50)

Diagnosis of subjects	Number of subjects (n=50)	Percentage (%)
Acute telogen effluvium (ATE)	14	28%
Chronic telogen effluvium (CTE)	21	42%
Female pattern Hair Loss (FPHL)	15	30%
Female pattern Hair Loss Male type (FPHL (M))	1	2%
Female pattern Hair Loss Olsen type (FPHL (O))	2	4%
Female pattern Hair Loss Grade II (FPHL II)	4	8%
Female pattern Hair Loss Grade III (FPHL III)	5	10%
Female pattern Hair Loss Grade IV (FPHL IV)	2	4%
Female pattern Hair Loss Grade V (FPHL V)	1	2%

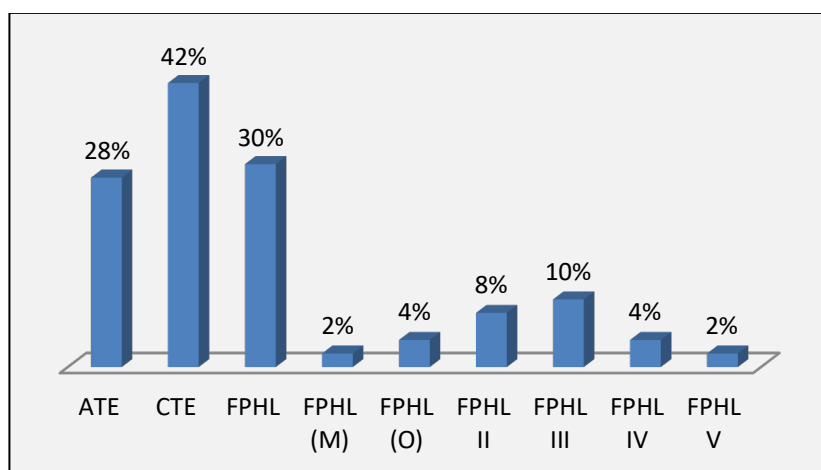


Figure 2: Diagnosis of patients (n=50)

Discussion

Non-Cicatricial diffuse hair loss in female, characterized by widespread hair shedding without scarring, affects females across various age groups. It often poses both cosmetic and psychological concerns, impacting self-esteem and quality of life. Understanding its multifaceted nature involves unraveling the interplay of hormonal imbalances, nutritional factors, genetics, and environmental influences.

In our study, the age distribution of 50 participants showcased a predominant representation in the 18-25 years age group (52%), followed by 25-30 years (32%), 31-40 years (10%), and those above 40 years (6%). In the study conducted by Vandana et al. [3], a

distinct pattern emerged with 75% of patients presenting within 2 months of onset in the 18-25 years group, while in the 36-45 years age range, 16.7% sought assistance. Furthermore, in this study, a significant proportion of patients (57.1%) presented within 2-6 months of onset in the 18-25 years age category. A diversified spectrum of age distribution emerged from Agrawal et al. [10] 's study, with the highest proportion (36.4%) within 30-40 years, followed by 29.9% in 18-30 years.

In our study, hair fall emerged as the predominant complaint (100%), followed by visible thinning (24%), itching (32%), and lack of volume (18%). Patel et al. [11] 's study also observed diffuse hair loss (DHL) as a common presentation (46%), along with visible thinning (VT) (21%). Kebbab et al. [12] 's

investigation further demonstrated positive hair pull tests in varying proportions between their two groups, along with reduced hair density in most patients (86% and 90% respectively). Vandana et al.'s findings echoed the prominence of diffuse hair loss (99%) and visible thinning (24%) as presenting complaints. Similarly, Agrawal et al. [10] identified diffuse hair loss (57.6%) and visible thinning (17.7%) as prominent patterns, with diverse combinations such as DHL plus visible thinning, decreased hair density, or patchy hair loss. These studies [7,10,12] collectively underscore the pervasive impact of non-cicatricial diffuse hair loss in females. Hair fall, visible thinning, and related concerns emerge as consistent complaints across investigations, while variations in the prevalence of associated factors and patterns demonstrate the intricate interplay of multiple factors contributing to this condition.

Analyzing the duration of hair loss among various studies, including our own, provides insights into the temporal aspects of non-cicatricial diffuse hair loss in females. Our study revealed that the majority experienced hair loss for less than 6 months (54%), followed by 6-12 months (28%), and more than 12 months (18%). Patel et al. [11] observed diverse durations, with a significant number experiencing hair loss within the first 6 months. Kebbab et al. [12]'s findings showed stark contrasts in duration between two groups, underscoring the wide variation in hair loss experiences. Poonia et al. [13]'s study focused on the mean duration, while Vandana et al. [3] presented a distribution with the majority experiencing hair loss for more than 6 months. The variations in the duration of hair loss across studies highlight the dynamic nature of this condition. Some individuals experience short-term hair loss, while others face more prolonged challenges.

In our study, past medical histories revealed varying factors contributing to hair loss. Diabetes Mellitus (DM) and thyroid dysfunction were noted in 4% and 8% of participants respectively. Febrile illnesses were observed in 6% of cases, while a history of childbirth, crash dieting, and surgery were each recorded in 6% of participants. Stress, both psychological and emotional, was experienced by 14% of individuals. Comparatively, Patel et al. [11] explored etiological factors and identified a diverse range, including febrile illnesses, stress, anemia, thyroid dysfunction, and more. Agarwal et al. [10] emphasized the role of family history, suggesting genetic involvement in the transmission of diffuse hair loss. Poonia et al. [13]'s investigation highlighted vegetarianism, psychological stress, acute illness, and major surgery as contributing factors. These comparative findings underscore the importance of considering a multitude of factors contributing to non-cicatricial diffuse hair loss. Genetic predisposition, stress, systemic illnesses, and lifestyle choices all interplay in varying degrees, necessitating a comprehensive approach to diagnosis and management.

Our study investigated various abnormal parameters among participants, including hemoglobin (Hb) levels, serum ferritin, thyroid abnormalities, Vitamin D, and Vitamin B12 levels. Among our participants, 38% had Hb levels below 12 gm%, 14% had serum ferritin levels below 10 mg/mL, 8% exhibited thyroid abnormalities, 2% had low Vitamin D levels (<12 ng/mL), and 18% had low Vitamin B12 levels (<200 pg/mL). Pattar et al. [3] observed thyroid abnormalities in 3.7% of cases and severe anemia in 10.3%. Poonia et al. [13] found that 57% of patients in their study were anemic, indicating a possible link between anemia and hair loss. Similarly, other studies like Deo et al. [14] reported high incidences of anemia in patients with hair loss, suggesting a potential role in the condition. Belgaumkar et al. [4] noted low serum ferritin levels in 23% of patients, indicating possible iron deficiency. Kebbab et al. [12] discovered significant differences in thyroid-stimulating hormone (TSH) concentrations between different groups, highlighting thyroid involvement.

Severe anemia and thyroid dysfunction were also noted in Patel et al.'s study, emphasizing their relevance in hair loss. While the relationship between these factors and hair loss is complex, these findings collectively underscore the significance of investigating and addressing these parameters when managing non-cicatricial diffuse hair loss. Anemia, thyroid dysfunction, and nutritional deficiencies may contribute to the condition, warranting comprehensive assessments and tailored interventions.

Our study delved into the diagnosis patterns of subjects with non-cicatricial diffuse hair loss. Notably, Chronic Telogen Effluvium (CTE) emerged as the most frequent diagnosis at 42%, closely followed by Female Pattern Hair Loss (FPHL) at 30% and Acute Telogen Effluvium (ATE) at 28%. This observation echoes findings from studies conducted by Poonia et al. [13], Patel et al. [11], Vandana et al. [3], Malkud S et al. [15], and Deo K et al. [14], all of which highlighted the significance of CTE, FPHL, and ATE in the spectrum of non-cicatricial diffuse hair loss. Poonia et al. [13] reported CTE as the dominant diagnosis at 62%, followed by FPHL at 22%, and ATE at 16%. Patel et al. [11] found ATE to comprise 31% of cases, CTE 22%, and FPHL 10%. Vandana et al. [3] noted ATE at 39%, CTE at 37%, and FPHL at 24% of diagnoses. In Malkud S et al. [15]'s study, 15.55% of cases had CTE, 11.66% had FPHL, and 0.55% had AE. Similarly, Deo K et al. [14] found common types of alopecia to be TE (62.2%) and FPHL (23.7%). These variations in pattern prevalence across studies could stem from diverse study populations, demographic factors, and geographic differences. While our study echoes the prominence of CTE, FPHL, and ATE, it's essential to account for these disparities when interpreting results and drawing comprehensive conclusions. Collectively, these studies underscore the relevance of CTE, FPHL, and

ATE as pivotal contributors to non-cicatricial diffuse hair loss.

Conclusion

In conclusion, our study sheds light on the complexity of non-cicatricial diffuse hair loss in females, emphasizing its multifaceted nature influenced by age, underlying factors, and diagnostic patterns with highest incidence in 18 to 25 years of age group. The prevalence of Chronic Telogen Effluvium, Female Pattern Hair Loss, and Acute Telogen Effluvium underscores their significance in this condition. Furthermore, various factors such as anemia, thyroid dysfunction, and nutritional deficiencies contribute to the overall picture of hair loss.

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