Original Research Article

"The comparison of Trichoscopic findings in female pattern hair loss (FPHL) and chronic telogen effluvium (CTE) in female patients"

ABSTRACT:

BACKGROUND: Chronic hair loss is a major complaint in middle-aged females. It is difficult to differentiate between female pattern hair loss (FPHL) and chronic telogen effluvium (CTE) in female patients. Trichoscopy is non invasive technique that can help to distinguish between FPHL and CTE.

Aims: To compare the trichoscopic findings in female pattern hair loss (FPHL) and chronic telogen effluvium (CTE) in female patients.

Material and Methods: It is a cross sectional prospective comparative study carried out in the department of dermatology, Acharya Vinoba Bhave Rural Hospital affiliated to Jawaharlal Nehru Medical College, Wardha, Maharashtra. Adult female patients between age group of 30 to 60 years complaining of diffuse hair loss were included in the study. Patients with scarring alopecia were excluded from the study. Patients were divided into two groups consisting of 20 patients in each group. In group A and B, female patients with female pattern hair loss and chronic telogen effluvium were included respectively. Trichoscan (SIF hair analysis system) was done on frontal region of the scalp.

Results: Hair diameter variability was significantly seen in FPHL. Hair diameter was reduced in FPHL (0.045) as compared to chronic telogen effluvium (0.063) with statistical difference between them. Hair density was significantly reduced in FPHL (32 ± 12.24) as compared to CTE (60.66 ± 18.12). Vellus hair density was significantly more in FPHL (22.4 ± 14.3) as compared to chronic telogen effluvium (7.73 ± 6.71). Single hair unit was more in FPHL (65 ± 17.08) as compared to chronic telogen effluvium. Density of yellow dots is more significantly observed in female pattern hair loss as compared to chronic telogen effluvium.

Conclusion: Trichoscopic features based on hair shaft diameter, hair follicular density, vellus hairs, yellow dots and variability in hair shaft diameter can easily help to distinguish female pattern hair loss from chronic telogen effluvium. This differentiation can help dermatologists to plan better and specific management of hair loss in female patients.

INTRODUCTION:

Hair loss can be damaging for the self-image and well-being. Diffuse non scarring hair loss is a common problem in women and major reason for consultation for hair related disorders. Young

girls to old women have varying degree of hair fall which can be acute or chronic onset diffuse hair loss. It is considered to be multifactorial problems ranging from telogen effluvium, chronic telogen effluvium and female pattern hair loss. Telogen effluvium(TE) is the most common cause of diffuse hair loss followed by chronic telogen effluvium(CTE) and female pattern hair loss(FPHL). [(1)]

In early stage, female pattern hair loss and chronic telogen effluvium presents in similar ways. The chronic telogen effluvium has to be differentiated from female pattern hair loss as the management approach is different in both the conditions. Trichoscopy is a reliable, non invasive, easy to use bed side technique that allows visualization of hair density, hair diameter, and epidermal portion of hair follicle, vellus hairs, and yellow dots and to study the surface of the scalp. It can be helpful in diagnosis of female pattern hair loss and chronic telogen effluvium without the use of biopsy.[(2)]

Material and Method: It was a prospective cross sectional comparative study carried out in the department of Dermatology, Acharya Vinoba Bhave Rural Hospital, afflicted to Jawaharlal Nehru Medical College, Wardha, Maharashtra. Institutional ethical committee clearance was taken before start of the study. Informed written consent was taken from each patient before enrolling in the study. Study was carried out between 25 to 60 years age groups of female patients. Female patients with acute telogen effluvium, alopecia areata, cicatricial alopecia, trichotilomania and traction alopecia were excluded from the study. Patients were randomly selected and enrolled in the study. Patients were distributed in A and B groups. In group A, clinically diagnosed cases of female pattern hair loss were enrolled while in group B, clinically diagnosed cases of chronic telogen effluvium were enrolled. Female patients with thinning and widening of central part of the scalp (Christmas tree pattern) with bitemporal recession were clinically diagnosed as female pattern hair loss and included into the Group A. Diffuse hair loss for more than 6 months without any obvious cause with no central parting or bitemporal recession were clinically considered as chronic telogen effluvium. Detailed history regarding onset, duration, severity was taken. Detailed history was taken to rule out other causes of hair loss in women.

Trichoscan used in present study was SIF hair analysis system which allows visualization of hair shaft thickness, hair density, percentage of vellus hairs, follicular units per unit area, yellow dots. Frontal region of the scalp were examined in each patient. Magnification ranging from 50x to 300x was used to visualize details of hair shaft and scalp epidermis. Result was analyzed using unpaired T test with significant level of P value < 0.05.

Result:

Table 1. Trichoscopic features in FPHL and CTE

	FPHL	CTE	p value
Anisotrichosis >20% (% of patients)	90	22	< 0.0001

Hair diameter	0.045 ± 0.006	0.0590 ± 0.008	< 0.002
Density(per unit area)	32 ± 12.24	60.66 ± 18.12	< 0.001
Vellus Hair (%)	22.4 ± 14.3	7.73 ± 6.71	< 0.001
Single hair unit (%)	65 ± 17.08	39 ± 11.08	< 0.003
Yellow dot	4.66 ± 1.72	1.33 ± 0.58	< 0.002

Variability in hair diameter more than 20% were seen in 90% of patients of female pattern hair loss(FPHL) which were statistically significant as compared to chronic telogen effluvium in which less than 20% variability of hair diameter was seen in 22% of the CTE patients. [Table 1] [Figure 1] Mean diameter of hair shaft in FPHL was 0.045 ± 0.006 while in chronic telogen effluvium mean it was 0.059 ± 0.008 with statistical significant difference of 0.001. [Table 1] Density of hair follicular units per unit area were significantly reduced in FPHL (32.54 ± 12.24) as compared to chronic telogen effluvium (60.66±18.12). [Figure 2] Percentage of vellus hairs were 22.4±14.3 in FPHL as compared to 12.73 ± 6.71 in CTE with significant difference of 0.001. Percentage of single hair follicular units were higher in FPHL (65.03 ± 17.08) as compared to chronic telogen effluvium (39.35 ± 11.08) with statistical significance of 0.003. [Table 1][Figure 3] Yellow dots per field of vision were significantly more in FPHL (4.66 ± 1.72) as compared to chronic telogen effluvium (1.33 ± 0.58). [Table 1] [Figure 4]

Discussion:

Acute Telogen effluvium is characterized by diffuse sudden onset, rapid shedding of club hairs mostly proceeds any triggering events like febrile illness, accidental trauma, major surgery, emotional trauma, drug intake, post partum and poor diet.[3] It is a self limiting condition and last only for 3 to 6 months which also can be improved with treatment of underlying condition. As described by David Whitings, chronic telogen effluvium is an idiopathic, chronic diffuse hair loss without central parting in middle aged women lasting for more than 6 months duration with normal histology. [4] It becomes evident clinically when more than 25% volume of hairs is reduced. [5] Pathogenesis of chronic telogen effluvium is unknown and the diagnosis are made only after exclusion of other causes of hair loss including thyroid disorder, other systemic disorders, anemia, chronic illness, emotional trigger by clinical and laboratory examinations.[6]

Female pattern hair loss is diffuse, slowly progressive, gradual onset predominantly affecting the frontoparietal region of scalp leading to widening of central parting. FPHL is characterized by miniaturization of hair follicles with normal anagen to telogen hair ratio with marked variation in hair diameter affecting frontal, central and parietal region of the scalp. [7] [8]

Female pattern hair loss is considered to be a major hair problem faced by mainly middle-aged women and also it is challenging for dermatologist to treat this condition. Prevalence of female pattern hair loss is not known in India, various studies done in China and Korea have mentioned the prevalence of about 5-6 % in middle aged women. [9] [10] The prevalence of female pattern hair loss increases with age with higher prevalence in post menopausal women of more than 60 years age and it shows inconsistent response to treatment.[11]

The main important differential diagnosis of female pattern hair loss is chronic telogen effluvium in an early stage of the disease. They are difficult to differentiate as both the disorders present with similar complaints of diffuse and episodic hair loss.[12] Distinction between these two conditions has to be made as natural history, pathogenesis, prognosis and management differs. [13] [14] The chronic telogen effluvium is a self limiting condition and can never cause baldness while FPHL is progressive causing significant decrease in hair density over time period which may leads to cosmetically unacceptable baldness. Biopsy can definitely help to differentiate between them as CTE shows classical histopathalogical findings and FPHL showed miniaturization of terminal hair with lower terminal to vellus hair ratio. Biopsy is an invasive procedure which cannot be practiced routinely. Trichoscopy can be used to differentiate between these two conditions as it is non invasive, easily available, simple to use which can visualize and assess scalp and hair characteristic. [15] It can give valuable clue to diagnosis, predict the course of the disease and avoid unnecessary need of invasive biopsy. [16] [17]
Variability in hair diameter (anisotrichosis) is definitive sign of FPHL. About 90% of the female pattern hair loss patients showed more than 20% variability in hair diameter while 22% of the patients in chronic telogen effluvium patients showed anisotrichosis. The findings of our study is in concordance with findings is reported by Bhamla et al. [18] Thin hairs are seen in chronic telogen effluvium but in FPHL, thin hairs with variability of diameter are more characteristically seen in FPHL.

Density of hairs in FPHL was significantly lower as compared to CTE patients. Similar finding was noted by Hatice et al study. [19] The percentage of vellus hairs was significantly higher in FPHL as compared to CTE. 22 percent of the hairs per unit area of the trichoscopy were vellus hairs in 90% of FPHL patients as compared to 7.73 % in 22 percentage of CTE. Sinclair showed telogen to vellus hair ratio of 4:1 in FPHL and 8:1 in chronic telogen effluvium suggesting consistency of finding in tricoscopy with that of biopsy.[12] Numbers of single hair units was predominately present in frontal region in FPHL as compared to CTE. Though the yellow dot is not specific trichoscopic finding in FPHL but percentage is significantly more as compared to chronic telogen effluvium. Similar findings on trichoscopy were found in Rakowska et al study.[20]

Rakowska et al has devised the trichoscopic criteria for the diagnosis of female pattern hair loss (FPHL). Lower mean hair thickness, more than 10% thin hairs in frontal area and more than 4 yellow dots per unit area is considered major criteria to diagnose FPHL. Tricoscopic findings are more pronounced in fontal area as compared to occipital area. This criterion is said to be 98% specific in diagnosing FPHL. No specific trichoscopic findings are observed in CTE other than short sharply ended hairs. [20]

Miniaturization of terminal hairs into vellus like hairs is main pathogenic mechanism in FPHL with lower terminal to vellus hair ratio. These vellus like follicles have shortened anagen cycle leading to production of fine, nonpigmented and short hair shaft.[21] Pathophysiologic

mechanisms of FPHL are considered to be multifactorial including the role genetic, androgen and micro inflammation.[21]

Trichoscopy can establish the diagnosis of FPHL based on various features without the help of invasive biopsy technique. Trichoscopy can bridge the gap between clinical and histopathological diagnosis. Early diagnosis of FPHL is possible with the help of trichoscopy. It also can help in monitoring treatment response in patients of female pattern hair loss.[2]

Conclusion:

Trichoscopic characteristic like hair density, variability in hair shafts, percentage of vellus hair, percentage of single hair unit and yellow Dots can help to diagnose FPHL and to distinguish it from chronic telogen effluvium which pose diagnostic dilemma in clinical practice.

FIGURE 1: Variability in hair diameter on trichoscopy

FPHL	CTE
	

Figure 2: Hair density in FPHL and CTE

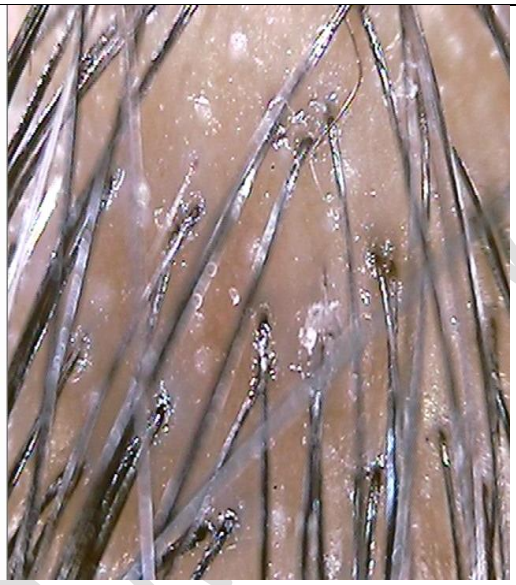
FPHL	CTE
	

Figure 3: Follicular hair units on trichoscopy:

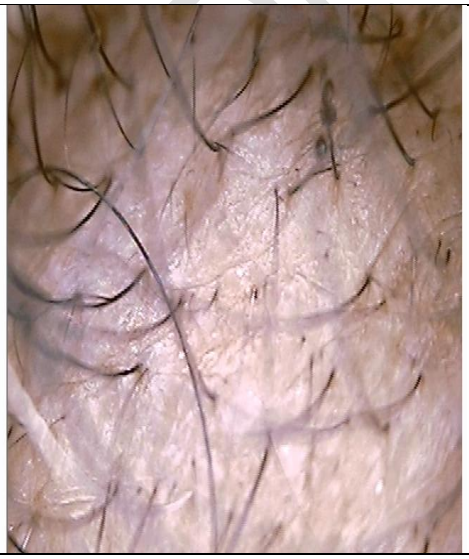
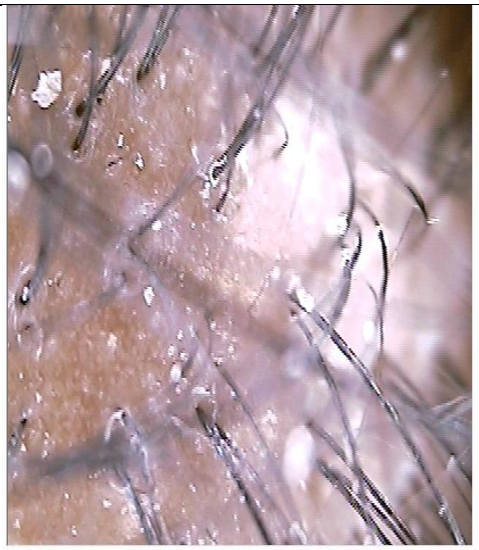
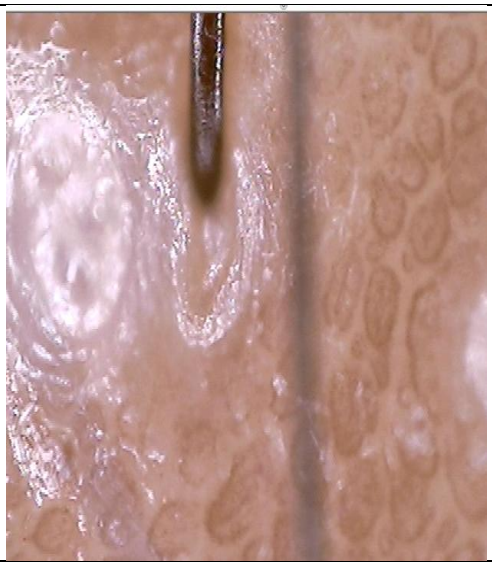
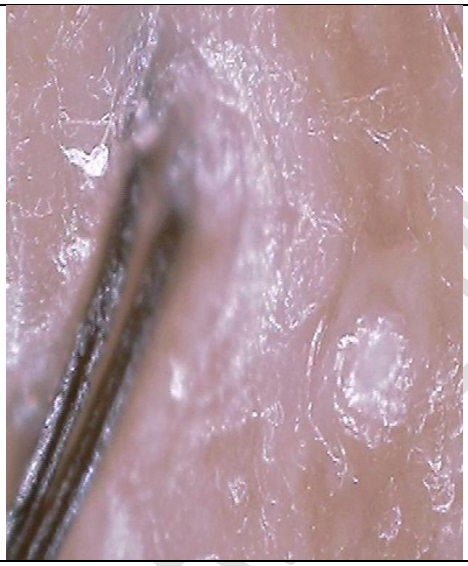
FPHL	CTE
	

Figure 4: Yellow Dots:

FPHL	CTE
	

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