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Original Research Article

Skin care physicians insight on epidemiological patterns, diagnosis and treatment modalities for female pattern hair loss

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ABSTRACT

Background: Female pattern hair loss (FPHL) is a common cause of hair loss in women characterized by a diffuse reduction in hair density over the crown and frontal scalp with retention of the frontal hairline. The underlying pathophysiology is multifactorial. There are no universally agreed treatment guidelines available. The objective of the study was to understand the diagnosis and treatment pattern of female pattern hair loss and the role of minoxidil topical formulation and its combination in the management of FPHL.
Methods: Predesigned questionnaire on FPHL was prepared based on review of literature and was filled by 80 consultant dermatologists. Recorded data was statistically analyzed.
Results: Common age of onset of FPHL was between 20 to 30 years. Majority (96.25%) have reported FPHL in association with psychological morbidity. The most preferred treatment in mild and severe FPHL was minoxidil 5% and platelet rich plasma (PRP) plus minoxidil respectively. Most dermatologists (47.5%) treated with minoxidil for over 6 months. Majority (27.5%) reported flaking as the most common side effect with minoxidil followed by dryness, scalp irritation and itching. Majority (27.5%) observed that long treatment duration was contributing to non-compliance followed by medication cost and side effects. Majority of the dermatologists (90%) felt the need for treatment guidelines in the current Indian scenario.
Conclusions: Minoxidil was the most common preferred treatment for mild and severe FPHL. PRP is the most common choice of combination therapy with minoxidil. Minimizing side effects, patient education and universal treatment guidelines can help manage FPHL better.

Keywords: Female pattern hair loss, Minoxidil, PRP

INTRODUCTION

The term female pattern baldness was used for diffuse alopecia in women since it was thought to be a variant of androgenetic alopecia in women.[1] The role of androgens in female pattern baldness development has not been fully demonstrated; hence, the term "female pattern hair loss (FPHL)".[2]

FPHL is a non-scarring progressive thinning of hair with a gradual decrease in the number of hair especially in the frontal, central and parietal scalp. The loss of terminal hairs is usually incomplete and the frontal hairline is often spared.[3] The incidence increases with advancing age, it may begin at any age following puberty and it is widely acclaimed that the prevalence increases post-menopause with a possible hormonal influence.[4]

The etiopathogenesis of FPHL is complex with genetic, hormonal, and environmental factors playing a pivotal role in it. FPHL tends to occur in genetically predisposed patients with altered hair follicle cycling and miniaturization of hair follicles leading to the transformation of the terminal to shorter and finer vellus hair follicles. The role of androgen in FPHL is not entirely understood and most women with FPHL show no clinical or biochemical evidence of androgen excess.[5]

The duration of anagen shortens dramatically from 3 to 6 years to a few weeks or months. In contrast telogen duration remains the same or lengthens to more than three months resulting in an accelerated turnover of anagen hair and a significant increase in the proportion of telogen hair.[6]

Three types of FPHL patterns have been described.[7]

Diffuse central thinning (Ludwig type)

The diffuse hair loss is concentrated over the frontoparietal region leading to thinning/rarefaction over the central scalp with the entire frontal hairline. Ludwig graded it into three stages depending upon whether the central thinning is mild (stage I), moderate (stage II) or severe, that is near-complete baldness of the crown (stage III).[8]

The 5-point sinclair scale is also used to describe this pattern.[9]

Frontal accentuation (Olsen type)

It leads to widening of the central parting line and after that to Christmas-tree pattern.[10]

Frontotemporal recession/vertex loss (male pattern/Hamilton type)

It leads to recession of the frontotemporal hairline or bitemporal recession and/or thinning at the vertex.

The first two types are common, and the third type is seen infrequently.

Diagnosis of FPHL is usually straightforward from the history and examination of the hair and scalp. Various methods to evaluate hair loss are6- daily and 60-s hair count, standardized and modified wash test, hair pull test and trichogram. Hormonal screening is indicated in cases with hyperandrogenism features, in women with sudden onset FPHL, rapidly progressive, severe or associated with the severe bitemporal recession and to rule out any underlying cause for androgen excess. A more complete screening panel for hyperandrogenism consists of free and total testosterone, dehydroepiandrosterone sulfate (DHEA-S), luteinizing hormone (LH), follicle stimulating hormone (FSH), triiodothyronine (T3), thyroxine (T4), thyroid stimulating hormone (TSH), prolactin and ultrasound ovaries and adrenal glands.[7]

Topical 2% minoxidil was approved by the Food drug administration (FDA) in 1991 for FPHL and 5% minoxidil foam once daily was approved in 2014.[3] Topical therapies with prostaglandin analogs, ketoconazole, melatonin and systemic treatment with cyproterone acetate, spironolactone, finasteride, dutasteride, flutamide and other treatment modalities including platelet rich plasma (PRP), micro needling, low level light therapy (LLLT), mesotherapy and hair transplantation have been used for treating FPHL.

In this study, we present the epidemiologic patterns, diagnosis, various treatment modalities and their side effects encountered during the management of FPHL by consultant dermatologists.

METHODS

It is a descriptive study. A questionnaire on epidemiologic patterns, diagnosis and various practices in the management of female pattern hair loss based on review of literature was designed. All doctors specialized in the field of dermatology in the city of Vijayawada were included in the study and asked to fill the survey based on their experience and the findings were recorded on a computer database and descriptive statistics were used to present the findings. This study was conducted in a period of 3 months from January to March 2020. Ethical clearance was obtained from institutional ethics committee of NRI Academy of Sciences.

RESULTS

Data was collected from 80 dermatologists. Of 80 dermatologists 29 (36.25%) see less than 10 cases of FPHL per month followed by 24 (30%) dermatologists who see 10 to 20 cases per month, 10 (12.5%) see 20 to 30 cases per month, 12 (15%) see 30-40 cases and 5 (6.25%) dermatologists see more than 40 cases per month. Of 80 dermatologists 37 (46.25%) have reported that the most common age of onset of FPHL among their patients was between 20 to 30 years followed by 32 (40%) dermatologists who reported 30-40 years age group, 8 (10%) reported in above 40 years age group, 1 (1.25%) reported in less than 20 years age group, 1 (1.25%) reported in less than 20 years and also 20 to 30 years age group and 1 (1.25%) reported 20 to 30 years age group and in above 40 years age group.

Majority of the dermatologists 77 (96.25%) have reported that FPHL is associated with psychological morbidity of varying severity. Hair loss was the most common presenting complaint reported by majority of dermatologists (39/80, 48.75%) followed by hair thinning (30/80, 37.5%), hair loss and hair thinning (7/80, 8.75%), hair loss with other complaints (3/80, 3.75%) and hair loss, hair thinning and baldness by 1 (1.25%) dermatologist.

Thyroid profile and anemia capsule were the most common investigations done by majority of the

dermatologists (24/80, 30%), followed by only anemia capsule (21/80, 26.25%), hormonal levels, thyroid profile and anemia capsule (12/80, 15%), only thyroid profile (7/80, 8.75%), hormonal levels, thyroid profile, anemia capsule and other investigations (4/80, 5%), hormonal levels and anemia capsule (3/80, 3.75%), hormonal levels and thyroid profile (3/80, 3.75%), hormonal levels (3/80, 3.75%), anemia capsule and other investigations by 1 (1.25%), thyroid profile, anemia capsule and other investigations by 1 (1.25%), hormonal levels and other investigations were done by 1 (1.25%) dermatologist.

Table 1: Preferred treatment of choice in mild FPHL by dermatologists.

Number of dermatologists (%)	Preferred treatment of choice by them
39 (48.75)	Minoxidil 5%
28 (35)	Minoxidil 2%
9 (11.25)	PRP plus minoxidil
1 (1.25)	Minoxidil 10%
1 (1.25)	Minoxidil 2% plus androgen-dependent medications
1 (1.25)	Minoxidil 5% plus androgen-dependent medications
1 (1.25)	Minoxidil plus PRP plus androgen-dependent medications

Most of the dermatologists (17/80, 21.25%) had used plain minoxidil in <10% of FPHL patients followed by 15 (18.75%) who used in 40-50%, 14 (17.5%) used in 10-20%, 12 (15%) used in 20 to 30%, 12 (15%) used in 30-40% and 10 dermatologists (12.5%) used in over 50% of patients. Preferred treatment of choice in mild FPHL was minoxidil 5% by most of dermatologists (39/80, 48.75%) followed by minoxidil 2% (28/80, 35%), PRP with minoxidil (9/80, 11.25%), minoxidil 10% (1/80, 1.25%), minoxidil 2% and androgen dependent medications (1/80, 1.25%), minoxidil 5% and androgen dependent medications (1/80, 1.25%), PRP, minoxidil and androgen dependent medications by 1 (1.25%) dermatologist. Shown in table 1.

Preferred treatment of choice in severe FPHL was PRP and minoxidil by most of the dermatologists (52/80, 62.5%) followed by androgen dependent medications (13/80, 16.25%), minoxidil 5% (7/80, 8.75%), PRP, minoxidil and androgen dependent medications (4/80, 5%), minoxidil 2% by 1 (1.25%), minoxidil 10% by 1 (1.25%), minoxidil 5%+ androgen dependent medications by 1 (1.25%) and PRP by 1 (1.25%) dermatologist. Shown in graph 1.

Preferred combination therapy in mild FPHL was topical minoxidil and peptides by majority of dermatologists (34/80, 42.5%) followed by minoxidil and PRP (25/80, 31.25%), minoxidil and finasteride (10/80, 12.5%), minoxidil and aminexil (8/80, 10%), minoxidil plus PRP and minoxidil plus aminexil by 2(2.5%), minoxidil plus aminexil and minoxidil plus peptides by 1 (1.25%).

Preferred combination therapy in mild FPHL was topical minoxidil and peptides by majority of dermatologists (34/80, 42.5%) followed by minoxidil and PRP (25/80, 31.25%), minoxidil and finasteride (10/80, 12.5%), minoxidil and aminexil (8/80, 10%), minoxidil plus PRP and minoxidil plus aminexil by 2 (2.5%), minoxidil plus aminexil and minoxidil plus peptides by 1 (1.25%). Preferred combination therapy in severe FPHL was minoxidil and PRP by majority of the dermatologists (47/80, 58.75%) followed by minoxidil and peptides (17/80, 21.25%), minoxidil and finasteride (7/80, 8.75%), minoxidil and aminexil (6/80, 7.5%), minoxidil plus PRP and minoxidil plus aminexil by 1 (1.25%), minoxidil plus PRP and minoxidil plus finasteride by 1 (1.25%), minoxidil plus finasteride and minioxidil plus peptides by 1 (1.25%).

Majority of the dermatologists (56 /80, 70%) noticed side effects in 10 to 20% of their patients, followed by 12 (15%) in 20 to 30%, 8 (16%) in 30 to 40%, 3 (3.75%) in 40 to 50% and only 1 (1.25%) in over 60% of patients.

Majority of dermatologists (22/80, 27.5%) reported flaking as the most common side effect with conventional minoxidil followed by dryness (15/80, 18.75%), scalp irritation (12/80, 15%), itching (8/80, 10%), itching and flaking (4/80, 5%), dryness and flaking (3/80,3.75%), irritation, itching, dryness and flaking in varying frequencies and combinations(10/80,12.5%) and no side effects reported by 2 (2.5%) dermatologists. Shown in graph 2.

Majority of the dermatologists (38/80, 47.5%) prescribed minoxidil for a period of 6 months to 1 year, followed by 3 to 6 months (24/80, 30%), for over 1-year (11/80, 13.75%) and for 1 to 3 months by 7 (8.75%) dermatologists. More number of dermatologists (31/80, 38.75%) observed that only 30-40% of patients were adherent to prescribed duration of therapy and 20 (25%) dermatologists observed only 10 to 30% while 17 (21.25%) observed 40 to 50%, 10 (12.5%) observed 50 to 60% and only 2 (2.5%) dermatologists observed 60 to 70% of their patients were adherent to treatment.

Most of the dermatologists (30/80, 37.5%) observed that only 30 to 40% of patients were coming for follow up visits while 16 (20%) observed 50 to 60% of their patients were coming for follow up, 13 (16.25%) observed 10 to 30%, 11 (13.75%) observed 60 to 70% and only 10 (12.5%) dermatologists observed that 40 to 50% of their patients were coming for follow up.

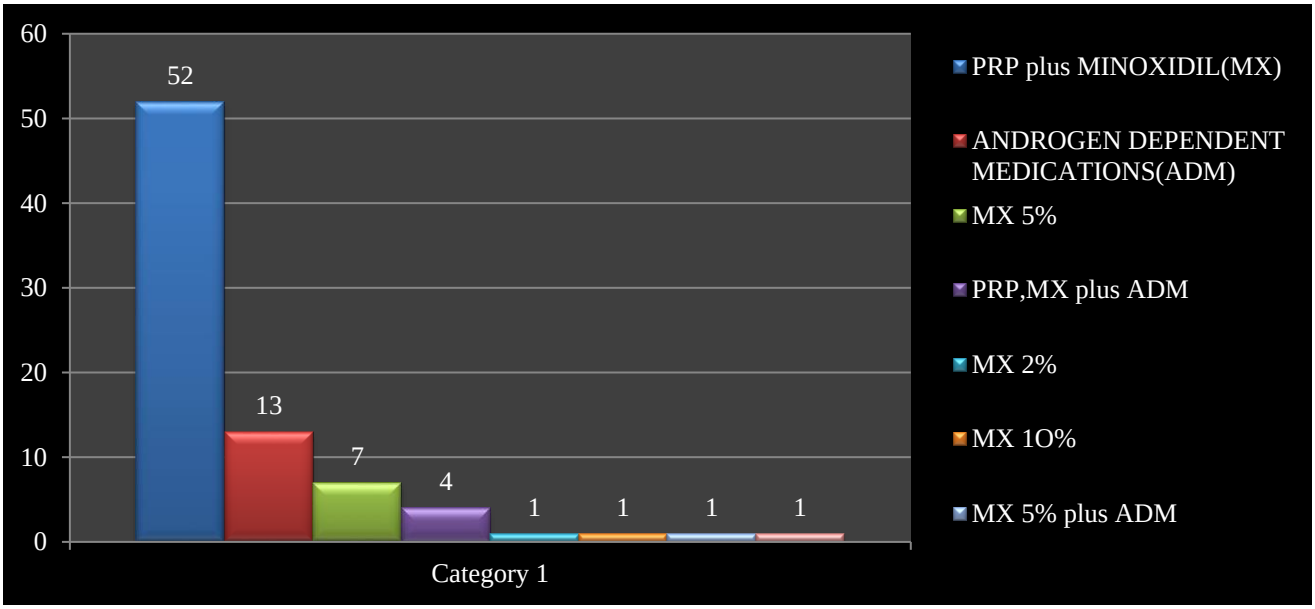

Figure 1: Preferred treatment of choice in severe FPHL by various dermatologists.

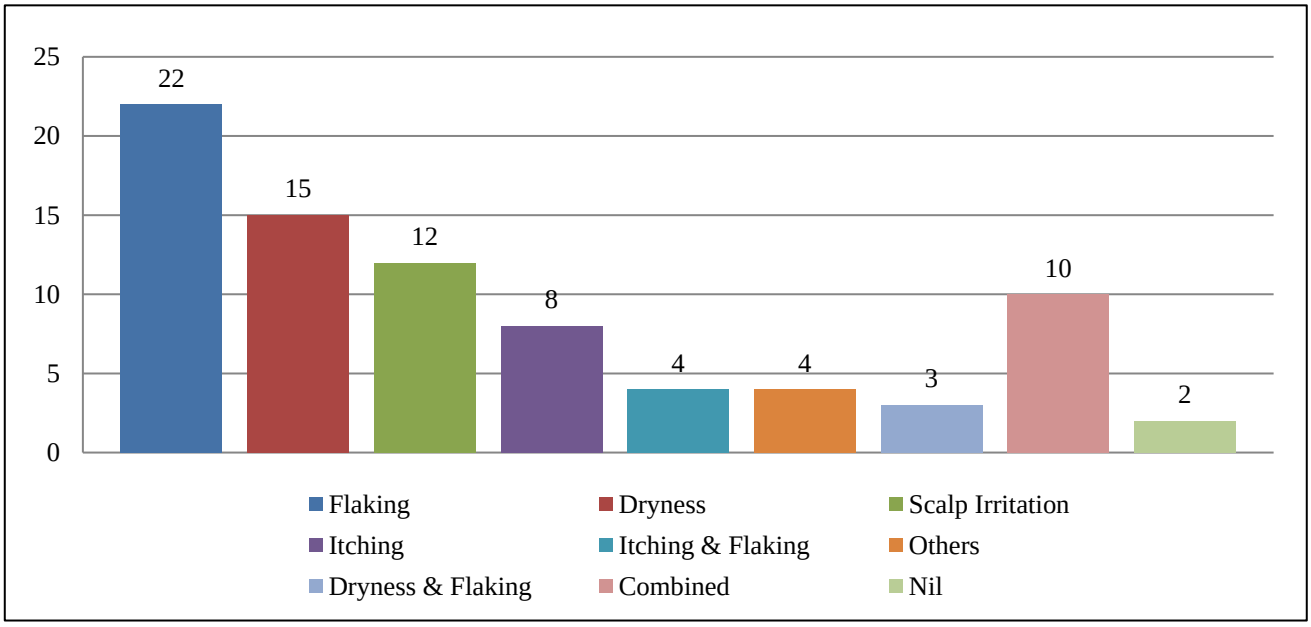

Figure 2: Common side effects noted with conventional minoxidil by various dermatologists.

Majority of the dermatologists (77/ 80, 96.25%) felt that the penetration capacity of the topical formulation is the most important factor for better clinical outcomes.

Of the 80 dermatologists, 22 (27.5%) observed that duration of treatment was mostly contributing to non-compliance of treatment followed by cost of medications (15/80, 18.75%), Side effects (13/80, 16.25%), lack of counseling (6/80, 7.5%), 6 (7.5%) observed only initial symptom relief, 6 (7.5%) observed duration of treatment and cost, 6 (7.5%) observed duration of treatment and side effects, 2 (2.5%) observed duration of treatment and only initial symptom relief, 4 (5%) observed varying combination of all these factors.

40 (50%) dermatologists were of the opinion that patient education in the form of hand-outs in regional language and incorporating patient education tips in the pack itself would help improve patient adherence to treatment and clinical outcomes. Followed by educational videos (13/80, 16.25%), In clinic posters (7/80, 8.75%), patient education in the form of hand-outs in regional language and in clinic posters (4/80, 5%).

29 out of 80 dermatologists (36.25%) felt the need for focused group discussions (FGD) to better understand and manage FPHL, followed by 18 (22.5%) opined on awareness programs, 11 (13.75%) opined on CMEs, 4 (5%) opined on FGD, CMEs, awareness programmes, 3

(3.75%) opined on case reports, 3 (3.75%) opined on FGD and advisory board meetings, 3 (3.75%) opined on case reports and FGD, 2 (2.5%) opined on CMEs and patient awareness programs, 1 (1.25%) opined in advisory board meetings and 6 (7.5%) thought that varying combination of these activities would help in better management of FPHL.

Most dermatologists (72/80, 90%) believed that there is a need for treatment guidelines in the current Indian scenario.

DISCUSSION

Women presenting with diffuse hair loss is a very common and challenging problem for dermatologists. One of the commonest causes for diffuse alopecia in women is FPHL.

In our study the majority of dermatologists see less than 10 cases of FPHL per month. Shen et al reported that the prevalence of the FPHL seems to be lower in the Asian population.[11] A Korean study shows that the prevalence of FPHL in Korean women at all ages was only 5.6%.[12] In our study, the most dermatologists observed that the most common age of onset of FPHL was in the age group of 20 to 30 years. Tosti et al reported that FPHL has its onset during the reproductive years and second peak was seen at menopause between 50 and 60 years of age. There is also a greater demand for treatment of FPHL among patients aged 25 to 40 years.[13,14]

In this study, most dermatologists have reported FPHL in association with psychological morbidity of varying severity. In a study done by cash F in Norfolk where 70 percent of affected women said they were very extremely upset about their hair loss.[15] Donk et al research show 88 percent of females with FPHL have associated psychological morbidity.[16] In our study, Hair loss was the most common presenting complaint, as noticed by the maximum number of dermatologists, followed by hair thinning. In Dinh et al study, hair loss was common, but severe hair loss as defined by Ludwig grade III or Sinclair grade 5 is uncommon and affected less than 1% of women.[17]

In our study, thyroid profile and anemia capsule were the common investigations done by 30% of dermatologists followed by only anemia capsule by 26.25%, hormonal levels, thyroid profile and anemia capsule by 15% of dermatologists. Zhang et al reported investigations like complete blood count, anemic profile, gonadal steroid hormones, thyroid function test and trichoscopy in his study. No association was found between the severity of FPHL and laboratory values.[18]

In our study, the preferred treatment of choice in mild FPHL was minoxidil 5% by 48.75% of dermatologists followed by minoxidil 2% by 35%. The preferred therapy of choice in severe FPHL was PRP plus minoxidil by 62.5% of dermatologists followed by androgen-dependent medications by 16.25%. Minoxidil is the only FDA approved drug for FPHL. Sinclair et al in his study used minoxidil topical solution 2% for mild to moderate FPHL without hyper androgenism. Minoxidil 2% plus anti-androgens for mild to moderate FPHL with hyper androgenism.[19]

Preferred combination therapy in mild FPHL was minoxidil with peptides by most dermatologists (42.5%) followed by minoxidil with PRP by 31.25, minoxidil with finasteride by 12.5%. Preferred combination therapy in severe FPHL was minoxidil with PRP by most dermatologists (58.75%). Other combinations used are minoxidil with peptides and minoxidil with finasteride. Siah et al in his study treated FPHL with a combination of 5% minoxidil, finasteride and spironolactone.[20] The superior benefit of using combination treatment which involves instituting two agents with a different mode of action has been reported in literature.[21,22]

In our study, 27.5% of Dermatologists reported flaking over scalp being the most common side effect with minoxidil followed by dryness, irritation and itching. Siah et al reported side effects from the treatments are uncommon and most are due to scalp irritation from using a minoxidil solution. The irritation is often resolved following discontinuation or switching to foam preparation.[21] In Olsen et al study itching, erythema, desquamation, folliculitis, contact dermatitis, and facial hirsutism in both men and women have been reported as adverse events caused by minoxidil.[23]

In our study, majority of dermatologists (47.5%) prescribed minoxidil for a period of 6 months to 1 year. Sinclair et al observed that treatment needs to be continued indefinitely. If treatment is stopped, clinical regression occurs within six months. The degree of alopecia will return to the level that would have occurred if there was no treatment.[24] Friedman et al observed that treatment should be continued for at least 12 months before an accurate appraisal of efficacy can be made.[25]

More number of dermatologists (38.75%) observed that only 30-40% of their patients were adherent to prescribed duration of therapy. Majority of dermatologists (37.5%) observed that only 30-40% of their patients were keeping their follow up appointments. In study by Siah et al patients with FPHL appear to have poor attendance at follow up appointments. As high as 59% of the patients failed to attend any follow up. Only 19% of patients managed to attend three follow up visits at 4 to 6 month intervals. Unrealistic expectations of treatment outcomes, dissatisfaction with the current treatment options and treatment side effects contributed to the poor attendance rate at follow up visits.[20]

In our study, 96.25% of the dermatologists felt that penetration capacity of the topical formulation is the most important factor for better clinical outcome. Eman et al. observed a significant enhancement of skin permeation when minoxidil was applied in nano-emulsion formulations containing penetration enhancers like

oleicacid and eucalyptol.[26] This is consistent with previous reports of enhanced delivery of both hydrophilic and lipophilic drugs from nano- and microemulsions containing chemical penetration enhancers.[27]

In our study, majority of dermatologists (27.5%) observed that long duration of treatment was contributing to noncompliance of treatment. Other factors were high cost, side effects, lack of counseling. In our study, 50% of the dermatologists felt that providing educational hand outs in regional languages and incorporating patient education tips in the pack itself would help in educating the patients and thereby improving treatment adherence and clinical outcomes. Tele counseling, in clinic-posters, patient education videos, were other interventions that would help as per dermatologists in this study.

Most of dermatologists felt that focused group discussions and awareness programs on FPHL would help in better management. Other activities such as CMEs, advisory board meetings, case reports were advised by few dermatologists. Most dermatologists (90%) were of the opinion that there is a need to develop treatment guidelines in the current Indian scenario.

Limitation of the study

This study is limited to dermatologists in one location. More such studies in different locations would be needed to better understand the paradigms in the management of female pattern hair loss.

CONCLUSION

Minoxidil was the most common preferred treatment for mild and severe FPHL. PRP is the most common choice of combination therapy with minoxidil. Combination of various drugs was used by dermatologists in the management of FPHL with variable outcomes. Psychological morbidity was significantly associated with FPHL and should be addressed. There is a strong consensus to develop universal treatment guidelines for FPHL in the current Indian scenario.

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