`A comparative study between topical minoxidil and systemic finasteride in treatment of female pattern hair loss

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Abstract

Background: Female pattern hair loss (FPHL) is the most common type of hair loss, affecting approximately 50%of women older than 40 years. Women with hair loss are more likely to have a lowered self-esteem and lowered quality of life than men. **Objective:**Comparison of the efficacy and safety of topical minoxidil 5%, topical minoxidil 2 % and systemic finasteride 1 mg in treatment of female pattern hair loss.

Patients and Methods: Study included 80 patients with history of female pattern hair loss (FPHL) of more than one year duration. Patients were divided randomly into 4 treatment groups and each patient received treatment for 6 months, group (A) topical **minoxidil 5%** (n=20), group (B) topical **minoxidil 2%** (n=20) and group (C) **systemic finasteride 1 mg daily** (n=20) and lastly group (D) **topical placebo** (alcohol 10%) (n=20). Efficacy was evaluated by Ludwig's grade of frontal hair thinning, patient self-assessment and investigator's assessment.

Results: Both 5% and 2% topical minoxidil showed more statistically significant difference than placebo in promoting hair growth in women with FPHL. Consistent statistical advantage of 5% topical minoxidil over 2% topical minoxidil was not demonstrated. The highest prevalence of drug-related adverse events of a dermatologic nature (such as pruritus, dermatitis, dryness, scaling) were showed with placebo, followed by minoxidil 5% then minoxidil 2%. Finasteride was no more effective than placebo except in slowing down hair loss. Oral finasteride was well tolerated by the women without evidence of systemic adverse effects except breast tenderness and menstrual irregularity.

Conclusion: Daily applications of minoxidil 5% or minoxidil 2% were found to be more effective than oral finasteride 1mg in treatment of FPHL.

Keywords: Female pattern hair loss, topical minoxidil, oral finasteride.

Introuduction

The term androgenetic alopecia (AGA) is often used to describe the patterned loss of scalp hair in genetically susceptible men and women. Female alopecia with androgen increase is called female androgenetic alopecia (FAGA) and without androgen increase is called FPHL [(1)]. FPHL may begin at any age following puberty and it is widely acclaimed that the prevalence increases post-menopausal with a possible hormonal influence [(2)].

FPHL is characterized by diffuse thinning in the frontal and parietal areas of the scalp; preservation of the frontal hairline is the normal. Hair over the occipital scalp is preserved in both sexes. Unlike MPHL in men, complete baldness in affected regions of the scalp is rarely observed in premenopausal women with FPHL, postmenopausal women, however, may develop, or progress to, a pattern of hair loss more characteristic of men with MPHL [(3)].

Pattern hair loss (PHL) can be classified into several patterns. Currently, the Hamiltone Norwood classification system for men and the Ludwig grade system for women are commonly used to describe patterns of hair loss [(4)]. The Ludwig Scale uses 3 different classifications, or Types, to diagnose the severity of female hair

loss. These Types include Type I, Type II, and Type III [5].

Until recently, the only US FDA-approved medication for women was 2% minoxidil solution, while both 2% and 5% solutions are available for men. FDA approved 5% minoxidil foam for FPHL only in 2014 [6].

Minoxidil appears to increase the duration of the anagen phase, and its angiogenic effects reverse miniaturization of hair follicles. Minoxidil has been shown to increase the proliferation of dermal papilla cells of the human hair follicle. Lastly, it is possible that minoxidil plays an immunoregulatory role in the hair follicle. In vitro studies demonstrate that minoxidil had a suppressive effect on normal human T-lymphocytes [7].

Finasteride, an inhibitor of 5α-reductase type II enzyme, suppresses systemic as well as hair follicular androgen activity by inhibiting conversion of T to its more active form, DHT. In women finasteride treats hirsutism and hair loss. The optimal dose of finasteride for male AGA has been identified as 1 mg/day. Doses of 1 mg/d - 2.5 mg/d were effective in premenopausal and postmenopausal women without hyperandrogenism and in hyperandrogenic women [8].

Patients and methods

This study has been conducted from April 2010 to April 2012. The study was approved by Research Committee at Faculty of Medicine, Sohag University. Patients with FPHL were randomly selected from those attending the dermatology outpatient clinic at Sohag University Hospitals. Prior to initiation of the study, every subject was informed about the aim of the study and gave a written consent.

Study population

This study included 80 patients with a complaint of progressive hair thinning or loss for more than one year duration and diagnosed clinically as FPHL**.** Women eligible for inclusion in this study were 17 to 60 years old with FPHL.

Exclusion criteria included:

1. Patients having other hair loss disorders, such as cicatricial alopecia, traction alopecia, trichotillomania, or alopecia areata, and those with evidence of systemic illnesses (e.g., cardiac, psychiatric, or metabolic disease).

2. Women who were pregnant, less than 12 months postpartum, or breast feeding.

3. Patients known to be hypersensitive to minoxidil.

4. Patients who concomitantly used hair restorer or systemic drugs (steroids, cytotoxic agents, vasodilators, antihypertensives, anticonvulsant drugs, B-blockers, diuretics, or any of the following specific agents: spironolactone, cimetidine, diazoxide, cyclosporine, ketoconazole, or replacement hormonal therapy).

5. Patients treated for hair growth within 6 months before enrollment in the study.

Methods:

Patients were divided randomly into 4 treatment groups and each patient received treatment for 6 months, group (A) topical **minoxidil 5%** (n=20), group (B) topical **minoxidil 2%** (n=20) and group (C) **systemic finasteride 1 mg daily** (n=20) and lastly group (D) **topical placebo** (alcohol 10%) (n=20).

Each patient was subjected to:

1. Proper history taking including personal history, female history, family history, history of hair care, previous medical treatment, and any present medications.
2. Each patient was subjected to complete physical examination and especially to any signs of anemia e.g.

pallor, tachycardia and red glassed tongue.

3. Local scalp examination was done to detect main site of hair loss, scalp visible or not, hair density, lice infestation, nets in scalp, and scar in scalp.

4. A picture of the frontal–parietal region is obtained in each patient before starting treatment (baseline) and at the end of treatment. Before the photograph was taken the patient's hair was combed in a consistent manner for each patient so that the balding area could be optimally viewed.

5. Patients were requested to maintain the same hairstyle, hair color and hair length throughout the Study. After the baseline visit (week 0), patients returned to the clinic for efficacy evaluation, safety evaluation of short term complications as erythema and itching and long term complications as breast tenderness s , or both every 4 weeks through the end of the 24 weeks trial.

Evaluation procedures:

a. Ludwig's grade of frontal hair thinning which was first applied before treatment and at the end of trial. Ludwig grade is categorized as, grade I, II, or III.

b. Hair growth questionnaire Patient's self assessment using a questionnaire consisting of questions, appearance of the hair, growth of hair , slowing down of hair loss, and general satisfaction with the therapy. Subjects were asked to fill out a questionnaire at week 24 that rate their overall hair loss condition in parietal or frontovertical areas compared to baseline. To facilitate answering the questionnaire, subjects were provided by standardized photographs of frontovertical areas of scalp taken at baseline and week 24[(9)].

c. Investigator assessment: The hair density in the frontoparietal region was compared to that observed before treatment using a 7-point rating scale: greatly decreased (-3), moderately decreased (-2), slightly decreased (-1), no change (0), slightly increased (+1), moderately increased (+2), and greatly increased (+3).

Statistical analysis

Statistical analysis was carried out using statistical package for the social sciences (SPSS Version 20). Numerical data were explored for normality by checking the data distribution, calculating the **SPSS,** with mean and median values and using Kolmogorov-Smirnov and Shapiro-Wilk tests. Age data showed parametric distribution while all other numerical data showed non-parametric distribution. Data were presented as mean and standard deviation (SD) values. For parametric data, one-way ANOVA was used to compare between the four groups. For non-parametric data, Kruskal-Wallis test was used to compare between the four groups. Mann-Whitney U test with Bonferroni's adjustment was used for pair-wise comparisons when Kruskal-Wallis test is significant. Wilcoxon signed-rank test was used to compare between Ludwig's classification scores before and after treatment. P value was statistically significant at < 0.05.

Results

Demographic data:

In this study, all of patients were in the age group of 17-55 years. The mean age of patients was 30.3±8.80 years with a mean duration of hair loss 3.4±2.96 (1-15) years. There was no statistically significant difference between mean age values, education and marital status in the four groups. As regard to residence there was a

statistically significant difference between the four groups, group (A) and group (D) showed the highest prevalence of subjects from rural areas (table 1).

Family history:

In this study 72.5% of patients had positive family history with mean age of hair loss was 23.78±6.87. There was a statistically significant difference between mean age of hair loss in patients with positive family history and those with negative family history (table 2).

Table (1): Demographic data in the four groups

	Group (A) (n = 20)	*Group (B) (n = 20)*	*Group(C) (n = 20)*	*Group(D) (n = 20)*	*P-value*
Age					
Mean ± SD	**28.8 ± 9.0**	**28.7 ± 6.1**	**32.6 ± 10.9**	**31.2 ± 8.8**	**0.430**
Range	**18-49**	**18-37**	**17-55**	**19-50**	
Residence (n, %)					
Rural	**14 (70%)**	**6 (30%)**	**9 (45%)**	**14 (70%)**	**0.024***
Urban	**6 (30%)**	**14 (70%)**	**11 (55%)**	**6 (30%)**	
Education (n, %)					
Illiterate	**3 (15%)**	**3 (15%)**	**6 (30%)**	**4 (20%)**	**0.972**
Read & Write	**3 (15%)**	**3 (15%)**	**2 (10%)**	**4 (20%)**	
Primary school	**1 (5%)**	**3 (15%)**	**3 (15%)**	**3 (15%)**	
High school	**10 (50%)**	**9 (45%)**	**7 (35%)**	**7 (35%)**	
University	**3 (15%)**	**2 (10%)**	**2 (10%)**	**2 (10%)**	
Marital status (n, %)					
Single	**8 (40%)**	**6 (30%)**	**6 (30%)**	**6 (30%)**	**0.683**
Married	**12 (60%)**	**14 (70%)**	**14 (70%)**	**14 (70%)**	
Divorced	**1 (5%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**	
Widowed	**0 (0%)**	**0 (0%)**	**0 (0%)**	**1 (5%)**	

**: Significant at P ≤ 0.05*

Table (2): Mean of age and duration of hair loss in patients with positive and negative family history

Positive family history	**Age (Years)**			**P-value**
	NO (%)	mean ±SD	Range	
Yes	58 (72.5%)	23.78 ±6.87	17.0- 55.0	**0.000***
NO	22 (27.5%)	38.62 ± 5.86	18.0-45.0	
Total	80 (100.0%)	30.30 ± 8.86	17.0-55.0	

**: Significant at P ≤ 0.05*

Evaluation assessment :

- **Ludwig's classification**

At the beginning of the study 25% (20) of the patients were Ludwig grade I, 47.5% (38) Ludwig grade II and 27.5% (22) Ludwig grade III.

Changes of Ludwig's classification after treatment in each group

As regard of Ludwig's classification after treatment, in group (A), (B) and group (C), there was a statistically significant change in Ludwig's classification after treatment. As regards group (D), there was no statistically significant change in Ludwig's classification after treatment (table 3, figure 1)**.**

Table (3): Comparison between Ludwig's classification before and after treatment in each group

Ludwig's classification	*Before treatment (n = 20)*		*After treatment (n = 20)*		*P-value*
	No	*%*	*No*	*%*	
Minoxidil 5%					**0.001***
Normal	**0**	**0.0%**	**2**	**10.0%**	
Grade I	**4**	**20.0%**	**8**	**40.0%**	
Grade II	**9**	**45.0%**	**6**	**30.0%**	
Grade III	**7**	**35.0%**	**4**	**20.0%**	
Minoxidil 2%					**0.001***
Normal	**0**	**0.0%**	**3**	**15.0%**	
Grade I	**6**	**30.0%**	**8**	**40.0%**	
Grade II	**9**	**45.0%**	**7**	**35.0%**	
Grade III	**5**	**25.0%**	**2**	**10.0%**	
Finasteride					**0.025***
Normal	**0**	**0.0%**	**0**	**0.0%**	
Grade I	**1**	**5.0%**	**5**	**25.0%**	
Grade II	**11**	**55.0%**	**8**	**40.0%**	
Grade III	**8**	**40.0%**	**7**	**35.0%**	
Placebo					**1.000**
Normal	**0.0**	**0.0%**	**0**	**0.0%**	
Grade I	**9**	**45.0%**	**9**	**45.0%**	
Grade II	**9**	**45.0%**	**9**	**45.0%**	
Grade III	**2**	**10.0%**	**2**	**10.0%**	

**: Significant at $P \leq 0.05$*

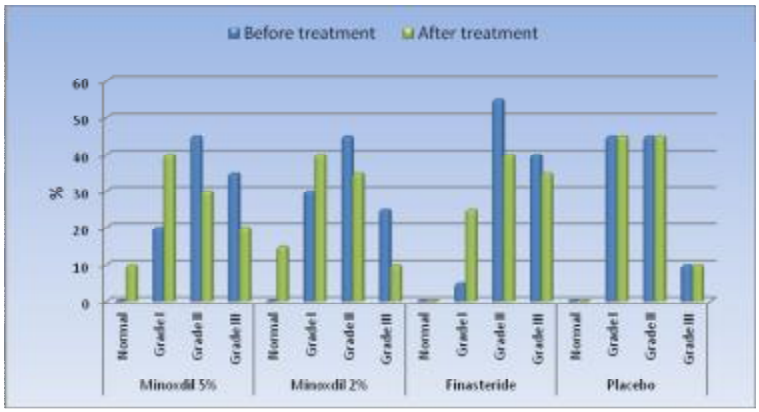

Figure (1): changes in Ludwig's classification after treatment in each group

- **Investigator assessment**

There was statistically significant difference between group (A) and group (B) and group (D) in investigator assessment. There was no statistically significant difference between group (C) and group (D) as well as between group (A) and group (B) (table 5).

Table (4): Comparison between investigator's assessments in the four groups

Investigator's assessment	*Group (A) (n = 20)*		*Group (B) (n = 20)*		*Group (C) (n = 20)*		*Group (D) (n = 20)*	
	n	***%***	***n***	***%***	***n***	***%***	***n***	***%***
Slightly decreased	0	0.0%	1	5.0%	0	0.0%	0	0.0%
No change	6	30.0%	6	30.0%	14	70.0%	15	75.0%
Slightly increased	10	50.0%	9	45.0%	5	25.0%	5	25.0%
Moderately increased	4	20.0%	4	20.0%	1	5.0%	0	0.0%

Group (A) vs group (D) **p1 = 0.000**, group (B) vs. group (D) p2 = **0.003**, group (C) vs. group (D) p3= 0.114, group (A) vs. group (B) p=0.559

- **Hair growth questionnaire:**

There was statistically significant difference between placebo group (group D) and both minoxidil 5% and 2% groups (groups A and B). In patient self assessment questionnaire of finasteride group (group C) as regard to slowing down hair loss finasteride group (group C) showed statistically significant difference in comparison with placebo group (group D).There was no statistically significant difference between finasteride group (group C) and placebo group (group D) as regard to bold spot getting smaller, hair appearance, hair growth, all items of satisfaction. As regard to hair growth, slowing down hair loss, hairline at the front satisfaction, hair on top of head satisfaction minoxidil 5%group (group A) showed statistically significant difference in comparison with 2% topical minoxidil group (group B).

Table (5): Comparison between hair growth questionnaires in the four groups

	Group (A) (n= 20)	**Group (B) (n= 20)**	**Group (C) (n= 20)**	**Group (D) (n= 20)**	**P1**	**P2**	**P3**	**P4**
Bald spot getting smaller	1.05 ± 0.60	0.60 ± 0.99	-0.40 ±.99	-0.55 ± 0.60	**0.000***	**0.000**	0.843	0.160
Hair appearance	1.65 ± 0.88	1.15 ± 1.04	0.30 ± 0.80	0.00 ± 0.86	**0.000***	**0.001 ***	0.250	0.113

Hair growth	1.70 ± 0.57	1.00 ± 0.86	0.50 ± 0.95	0.30 ± 0.57	**0.000***	**0.005***	0.445	**0.002 ***
Slowing down hair loss	2.10 ± 0.45	1.60 ± 0.80	1.55 ± 0.76	1.05 ± 0.55	**0.000***	**0.006***	0.027 *	**0.031 ***
Hairline at the front satisfaction	0.65 ± 0.81	0.05 ± 0.94	-0.90 ±.72	-1.20 ± 0.52	**0.000***	**0.000***	0.147	**0.038 ***
Hair on top of head satisfaction	0.65 ± 0.93	0.05 ± 0.94	-0.65 ±.99	-1.10 ± 0.55	**0.000***	**0.000***	0.128	**0.031 ***
Hair overall satisfaction	0.30 ± 0.98	-0.05 ± 1.23	-1.00 ± .56	-1.20 ± 0.41	**0.000***	**0.001**	0.224	0.226

Group (A) (5% minoxidil) vs. Goup (D) (placebo) p1
Group (B) (2% minoxidil) vs. Group (D) (placebo) p2
Group (C) (finistride) vs. group (D) (placebo) p3
Group (A) (5% minoxidil) vs. Group (B) (2% minoxidil) p4

Side effects

Group D showed statistically significant increase in pruritus, dryness and scaling in comparison with other three groups followed by group B. Group (A) was the only group that showed statistically significant increase in hypertrichosis in comparison with other three groups. Group (C) was the only group that showed breast tenderness.

Table (6): Comparison between side effects in the four groups

Side effects	***Group (A) (n = 20)***		***Group (B) (n = 20)***		***Group (C) (n = 20)***		***Group (D) (n = 20)***		***P-value***
	n	***%***	***n***	***%***	***n***	***%***	***n***	***%***	
Pruritus	13	65.0%	4	25.0%	0	0.0%	15	75.0%	**<0.001***
Dryness	9	45.0%	3	15.0%	0	0.0%	12	60.0%	**<0.001***
Headache	4	25.0%	1	5.0%	4	25.0%	2	10.0%	**0.270**
Scaling	6	30.0%	3	15.0%	0	0.0%	12	60.0%	**<0.001***
Hypertrchosis	4	25.0%	0	0.0%	0	0.0%	0	0.0%	**0.006***
Breast tenderness	0	0.0%	0	0.0%	4	25.0%	0	0.0%	**0.006***
Menstrual irregularity **Palpitation**	0 1	0.0% 5.0%	0 0	0.0% 0.0%	1 0	5.0% 0.0%	0 0	0.0% 0.0%	**0.386** **0.386**

****: Significant at P ≤ 0.05***

Discussion

FPHL is the most common type of hair loss affecting women but estimation of its true prevalence varies widely [(10).] This is principally because investigators do not clearly state the diagnostic criteria that have been used in their studies. However, it is generally recognized that the prevalence of FPHL increases with age. Hair loss can have a serious psychological impact on people [(11).]

There is deficiency in the comparative study to evaluate the efficacy between minoxidil and finastride in treatment of female pattern hair lossIn this study we assessed and compared two agents in the treatment of FPHL: topical minoxidil in different concentration 2% and 5%, and oral finastride in a dose of 1mg once daily .

In this study, all patients were in the age group of 17-55 most of them were educated (65%) which could probably be due to the fact that they are more

cosmetically aware and concerned about hair loss. The mean age of hair loss was 30.3±8.80 years with a mean

duration of hair loss was 3.4±2.96 years. These results were near to another studies were done by **Zhang et al (2012)** [12] and **Okram et al (2015)** [13] who reported that the mean age of hair loss were 34.4±10.6, 29.22±13.01 respectively and mean duration of hair loss were 4.49±3.7,2.00±1.88 respectively .

Positive family history was 72.5 % of all patients participated in this study. Our result was in agreement with **Sharquie et al (2009)** [14] who found that family history of FPHL was positive in 70% of patients but our result was higher than **Zhang et al (2012)** [12] who showed that the incidence was 45%, so this remarkably higher incidence in our study than previous studies can be explained by marriage between relatives is common in our community. Patients with family history had an earlier onset of hair loss (23.78± 6.87) as compared to patients without positive family history (38.62±5.86). In accordance with our results **Okram et al (2015)** [13] found that patients with family history had an earlier onset of hair loss (23.49±10.16) as compared to patients without hair loss (29.75±13.10).

As regard of Ludwig classification after treatment, in minoxidil 2% group (B), there was a statistically significant change in Ludwig's classification after treatment. Investigator assessment of minoxidil 2% group (group B) showed the highest prevalence of slight and moderate increase in hair density with statistically significant difference than placebo group (group D). As regard to bold spot getting smaller, hair appearance, hair growth, slowing down hair loss and satisfaction 2% topical minoxidil group (group B) showed statistically significant difference than placebo group (group D).

As regard of Ludwig's classification after treatment, in minoxidil 5% group (A), there was a statistically significant change after treatment. Investigator assessment of minoxidil 5% group (group A) showed the highest prevalence of slight and moderate increase in hair density There was statistically significant difference between minoxidil 5% group (group A) and placebo group (group D) in investigator assessment. As regard to self assessment questionnaire bold spot getting smaller, hair appearance, hair growth, slowing down hair loss and satisfaction 5% topical minoxidil group (group A) showed statistically significant difference than placebo group (group D).

Consistent statistical advantage of 5% topical minoxidil over 2% topical minoxidil was not demonstrated. There was no statistical significant difference in Ludwig's grade of frontal hair thinning and in patient self assessment questionnaire concerning with the bold spot getting smaller and hair overall satisfaction and hair appearance but in hair growth, slowing down hair loss and satisfaction with hair hairline at the front and hair on top of head topical minoxidil 5% showed statistically significant difference than topical minoxidil 2%.

The highest prevalence of drug-related adverse events of a dermatologic nature (pruritus, dermatitis, dryness, scaling) showed with placebo (group D), followed by minoxidil 5% group (group A) then minoxdil 2% group (group B). The most frequent drug related dermatologic event was pruritus. This finding may be related to the higher percentage of propylene glycol in topical minoxdil 5% and alcohol in placebo.

Minoxdil 5% group (group A) was the only group that showed hypertrichosis. The hair growth was on the face; there were no reports of generalized hypertrichosis. Headache was reported as drug-related adverse event, affecting

25% of patients of minoxdil 5% group (group A). Drug related cardiovascular events (palpitation) were reported once only in one of the patient in minoxidil 5% group (group A). So the both concentrations of topical minoxidil were well tolerated by the women without evidence of systemic adverse effects.

These results are consistent with those obtained by **Lucky et al (2004)** [(15)] who compared efficacy of minoxidil 5%, minoxidil 2% and placebo in female patients showed that after 48 weeks of therapy, 5% topical minoxidil was superior to placebo for each of the primary efficacy measures. 2% topical minoxidil was superior to placebo for investigator assessment. Minoxidil 5% showed more stimulation of hair growth with statistical significant difference than minoxidil 2%. Patients in the higher concentration group were more likely to experience treatment-related side effects such as scalp pruritus, irritation, and facial hypertrichosis but no evidence of of systemic adverse effects in both groups.

Blume-Peytavi (2011) [(16)] showed that after 24 weeks of therapy, 5% MTF (Minoxidil topical foam) is non inferior and as effective for stimulating hair growth as twice-daily 2% MTS in women with androgenetic alopecia and this is inconsistent with our results which show statistical adventage of 5% minoxdil for stimulating hair growth. This may be due to application of minoxdil 5% once daily versus twice daily in our study. **Blume-Peytavi (2011)**[(16)] also showed that women randomized to 5% MTF experienced significantly lower rates of local intolerance (P = .046) especially in pruritus and dandruff compared with 2% MTS, and this also inconsistent with our results where patient in the higher concentration group were more likely to experience treatment-related side effects such as scalp pruritus, iritation, but this also may explained by the foam formula which was used by Blume-Peytavi (**2011)** [(16).]

In finasteride group (group C), there was a statistically significant difference in Ludwig's classification after treatment but no significant difference in investigator assessment after treatment compared to placebo group (group D). In patient self assessment quesionnaire as regard to slowing down hair loss finasteride groups (group C) showed statistically significant difference in comparison with placebo groups (group D).There was no statistically significant difference between finasteride group (group C) and placebo group (group D) as regard to bold spot getting smaller, hair appearance, hair growth and all items of satisfaction. This can be explained by that anagen phase of scalp hair growth has duration of several years (2-8 years) and is much longer than that on the face (about 3 months). Therefore, it is possible that a protocol involving a very much longer observation period is needed to obtain significant findings of regrowth of scalp hair.

Consistent statistical significant difference of 5% and 2% topical minoxdil over oral finistride was demonstrated in promoting hair growth in women with FPHL for investigator assessment, and patient self assessment questionnaire except slowing down hair loss and Ludwig's grade of frontal hair thinning, where finistride showed statistically significant difference from placebo but still less significant than minoxdil 2% and 5%.

In finasteride group (group C) headache was the most commonly reported drug-related adverse event, affecting 25% of the patients also this group was the only group that showed breast tenderness and menstrual irregularity. Oral finasteride was well

tolerated by the women without evidence of systemic adverse effects except breast tenderness and menstrual irregularity.

Price et al (2000) [17] agreed with our results as regard to finasteride**.** He reported that finasteride at 1 mg/day for1 year in postmenopausal women with FPHL failed to show increasing growth or improved appearance of hair. Participant- and investigator-rated assessments were largely in agreement that finasteride was no more effective than placebo. Finasteride was generally well tolerated but disagree with us in that finasteride in his study showed no slowing down hair loss. **Carmina and Lobo (2003)** [18] reported that finasteride 5 mg/day is not effective in FPHL in postmenopausal women, this is consistent with our results except that in our results finasteride showed slowing down hair loss in self assessment questionnaire and this may be explained by enrollment of different age groups and is not restricted to postmenopausal women (non-exclusively postmenopausal population).

Results of this study are not consistent with **Iorizzo et al (2006)** [19] who showed some improvement in 62% of patients with finasteride 2.5 mg daily. **Soares et al (2013)** [20] showed that finasteride 5 mg/day for 18 months is effective and safe for the treatment of FPHL in postmenopausal women in the absence of clinical or laboratory signs of hyper-androgenism .this can be explained by higher dose of finasteride used and also the longer duration of treatment and more number of patients.

We can speculate as to why finasteride did not show any efficacy in improving hair growth in women with FPHL and it was effective in male with androgenic alopecia. Women and men with AGA have increased levels of 5-α redeuctase in frontal follicles compared with occipital follicles, but women have only about one third the amounts that men have. Other factors, in scalp hair follicles besides 5α- reductase may also be important in the pathophysiology of AGA, including the level of aromatase, the enzyme that converts testosterone to estradiol, and the number of androgen receptors **(Sawaya and Price, 1997)** [21].

There may be another explanation; women and men in the later decades of life may develop thinning scalp hair, which may not be 5α-reductase or DHT-dependent. This late onset decrease in scalp hair density (senescent hair thinning). Senescent scalp hair thinning may appear as a continuum with earlier-onset AGA or may appear for the first time in someone who had dense hair until the later decades. It is possible that some of the women in this study had late-onset or senescent thinning that will not respond to finasteride, a highly specific inhibitor of type 5α-reductase.

The main limitations of this study were subjective assessment, short duration of treatment and small number of participant in each group. Low dose of finastiride used in this study may affect the results of efficacy. Further studies should be performed to a better understanding of the minimal finasteride effective dose as well as to predict non-responder patients. Greater efforts are needed to classify women accurately into appropriate subsets for which this treatment option may be beneficial. Long-term adverse effects are also a fundamental concern.

In conclusion, daily applications of minoxdil 5% then minoxdil 2% were found to be more effective than oral finistride 1mg in treatment of FPHL in the absence of clinical or laboratory signs of hyper-androgenism.

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الملخص العربى

دراسة مقارنة بين محلول مينوكسيديل و وعقار الفينيستريد في علاج الحاصة ألأندروجينية لدى السيدات

الحاصة الأندروجينية (الصلع الوراثي): هي أكثر أشكال فقدان الشعرشيوعاً ، وتحدث لدى كلا الجنسين في أي وقت بعد البلوغ ، ولكن الذروة تكون في عمر ٢٠ ـ ٣٠سنة. تؤدي عند الذكور إلى صلع جزئي أو كامل ، وعند الإناث إلى تباعد أو خفة الشعر. آلية الحدوث هي نقص تدريجي في الجريبات الشعرية بتأثير الأندروجينات. أول ما تلاحظه النساء المصابات هو تساقط تدريجي لشعرهن ، غالباً في قمة الرأس، بحيث يصبح جلد الفروة أكثر قابلية للرؤية ، ومع مرور الوقت يمكن أن يخف الشعر في الجوانب أيضاً . وقد تشكو المصابة من أن "ذيل حصانها"صغير جداً .تتباين شدة هذا التساقط المنتشر بين مصابة وأخرى ، ولكن من النادر جداً عند النساء أن يحدث صلع تام في قمة الرأس . يظهر فحص الفروة أن فقدان الشعر يتبع نماذج معينة، حيث يبقى خط الشعر سليماً ولكن الجزء المركزي، وأحياناً الصدغي، يكون متوسعاً بالمقارنة مع الناحية القذالية.
المعالجة الرئيسية للحالة هي محلول مينوكسيديل الذي يعمل على زيادة التروية الدموية مؤديا لتنشيط بصيلات الشعر . وحديثا يمكن للرجال في حال وجود تساقط شعر من منشأ هرموني استخدام الأدوية التي توقف عمل الهرمونات على الأشعار نتيجة لتأثيرها على خميرة تدعى ٥ألفا ريدوكتاز مؤدية لتوقف تساقط الشعر مثل مركبات الفيناستراياد وعقار الفينيستريد هو عقار مثبط لإنزيم ٥- الفا ريداكتاز النوع الثاني ، وهو الذي يمنع تحويل هرمون التيستوستيرون إلى الدايهيدروتيستوستيرون (الماده النشطه لهرمون الأندروجين).

نتائج البحث:

١. ٧٥,٥ % من المشاركين فى الدراسة لديهم تاريخ أسرى أيجابى وهؤلاء يعانون من بداية مبكرة لفقدان الشعر بالمقارنة مع الذين ليس لديهم تاريخ أسرى أيجابى.

٢. أكثر ألأماكن شيوعا لفقدان الشعر من فروة الرأس المنطقة ألأمامية يليها فقدان موزع على فروة الرأس ثم فقدان فى قمة الرأس مع المنطقة الامامية.

٣. عقارمينوكسديل الموضعى ٢% و٥% لديه فاعلية أكثر من البلاسيبو فى وقف التساقط وتحفيز نمو الشعر لدى النساء المصابات بالحاصة ألأندروجينية.

٤. عقار مينوكسديل ٥% لديه فاعلية أكثر من ٢% فى ابطاء فقدان الشعر و وتحفيز نمو الشعر لدى النساء المصابات بالحاصة ألأندروجينية.

٥. وجد ان دواء الفينستريد ليس اكثر فاعلية من البلاسيبو فى علاج الحاصة الاندروجينية ألأ فى تقليل معدل سقوط الشعر ولكن يظل اقل فاعلية من المينوكسديل ٢% و ٥%.

٦. النسبة ألأكبر لحدوث اعراض جانبية مثل الحكة، الجفاف وقشور فروة الرأس حدثت مع البلاسيبو يليها مينوكسديل ٥% ثم ٢%.