A 47-year-old woman presented to the clinic with complaints of excessive hair loss and thinning of hair from the past one and a half year; no family history of hair loss was reported. She had been prescribed minoxidil solution 2%, which she used for a few months but failed to get any improvement, and therefore, subsequently discontinued the usage. She also denied the use of new medications or any recent emotional stress. On physical examination, diffuse thinning on the majority of scalp was noted. A hair pull test was positive, with more than 8 telogen-appearing hairs pulled out. Digital microscopics examination also revealed 80% miniaturization of hair follicles diffusely, with around 10% macroradicular on the frontal scalp. All laboratory tests, including androgen levels were found to be within the reference range. A punch biopsy revealed 22 hair follicles: 13 terminal, 8 vellus, and 1 telogen/vellus hair follicle. The terminal to vellus ratio was found to be 1.0 to 1. The peribulbar or peri-microfollicular infiltrates were absent. Mucin, interface change, or scarring was not noted.

The findings were suggestive of female androgenetic alopecia. The study was continued for 3 years. The women were divided in 2 categories; one containing women of 30 years and above and the other including women below 50 years of age. A statistically significant increase in hair thickness was observed from baseline over the 3-year period, which was 63.5% in above 50 years group and 80% in below 50 years age group, with overall effectiveness of 81.7%.

A good scalp coverage and hair structure (SCSH) assessments and effectiveness were seen after 3 years of treatment with finasteride, as shown in Table 1.

It is known that nutrition influences hair loss and hair conditions, as illustrated by the hair problems associated with disorders caused by severe malnutrition, such as anemia, anorexia nervosa, bulimia, and kwashiorkor. Vitamins, minerals, and other nutrients are frequently used in a large range of products that claim to be efficient in the treatment of hair loss.

A study was conducted by Le Floc’h et al. to evaluate the efficacy of a nutritional supplement on hair loss and hair condition versus control. A total of 120 healthy women were enrolled in a double-blind, placebo-controlled, multicenter, randomized clinical trial. Patients in both groups were administered either a placebo or a nutritional supplement containing vitamins and minerals such as zinc, biotin, and iron.

The study showed that the nutritional supplement contained biotin, and iron added to the placebo significantly improved hair density, which is often seen after puberty in females. Although FPHL does not cause any serious health consequences, it is distressing and is reported to affect approximately 50% of females over 50 years of age. Some FPHL-affected females are observed to respond to anti-androgens or 5-reductase inhibitors. This is indicative of an androgen-related pathology in female alopecia.

Bosma et al., conducted a study to evaluate the efficacy of finasteride 1.25 mg on hair loss in women with androgenetic alopecia. The study was conducted for 3 years.

The terminal to vellus ratio was found to be 1.6 to 1. The peribulbar or peri-microfollicular infiltrates were absent. Mucin, interface change, or scarring was not observed.

Hair pull test was positive, with more than 8 telogen-appearing hairs pulled out. Digital microscopics examination also revealed 80% miniaturization of hair follicles diffusely, with around 10% macroradicular on the frontal scalp. All laboratory tests, including androgen levels were found to be within the reference range. A punch biopsy revealed 22 hair follicles: 13 terminal, 8 vellus, and 1 telogen/vellus hair follicle. The terminal to vellus ratio was found to be 1.0 to 1. The peribulbar or peri-microfollicular infiltrates were absent. Mucin, interface change, or scarring was not noted.

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A good scalp coverage and hair structure (SCSH) assessments and effectiveness were seen after 3 years of treatment with finasteride, as shown in Table 1.
Role of nutritional supplements in hair growth

Amino acids
Chemically, hair comprises 97% protein and is thus primarily made up of amino acids, which are the building blocks of proteins. Leucine aids in preventing hair fall and promoting blood supply to the scalp. Thus, it can considerably strengthen the hair structure. Lysine, the amino acid prevalent in vegetables and legumes, inhibits 5α-reductase type II.

Biotin
Gamma-linolenic acid has shown to stop the thinning of hair. Biotin plays an important role in a number of enzymatic reactions within the body, and it is required for proper metabolism of protein, fat, and carbohydrates. A period of time, poor metabolism of nutrients can lead to undernourished hair follicle cells. Biotin deficiency can result in hair loss. A study conducted at Harvard University suggested that biotin is one of the most crucial nutrients for preserving hair strength, texture, and function.

Vitamin B6, niacin and pantethonic acid
Reduced levels of riboflavin (vitamin B2), niacin, and pantethonic acid can result in the undernourishment of hair-follicle cells.

Psychological factors
Toxins in the hair

Folic acid
A reduction in folic acid may contribute to decreased hair-follicle cell division and growth. Folic acid is also important for the maintenance of healthy methionine levels in the body. Signs of folic acid deficiency are amenorrhea, fatigue, and graying of hair.

Insolot
Insolot is a precursor for phospholipids. Phospholipids are considered to be important for healthy hair follicle development.

Finasteride in androgenetic alopecia

Finasteride is the first and only oral medication to be approved by the Food and Drug Administration in treatment of male-pattern hair loss. Finasteride is a specific inhibitor of type II 5α-reductase, which converts testosterone into dihydrotestosterone that affects the hair follicle regression. By decreasing scalp tissue levels of dihydrotestosterone, finasteride aids in suppressing male-pattern hair shedding. Various public health reports have listed the usefulness of this drug in the treatment of androgenetic alopecia. A systematic review of 12 studies has presented moderate quality evidence which suggests that the daily use of oral finasteride assists in increasing hair count. Long-term use of finasteride for up to 5 years has shown to reduce the likelihood of developing further visible hair loss. A study of 370 men with high levels of serum 5α-di-hydrotestosterone noted that initiating the drug in younger patients had a better response. A double-blind study conducted recently revealed that the therapeutic effects of 1% finasteride gel applied twice daily and oral finasteride, 1 mg daily were relatively similar. Topical finasteride can be considered as a choice for hair density maintenance after initial improvement with oral finasteride, thus avoiding the need for using oral finasteride indefinitely.

A study conducted to evaluate the effects of finasteride on hair weight and count over 4 years in men with AGA revealed good results of finasteride over placebo in terms of hair count and hair weight as shown in Figure 1.

These studies revealed that the drug is efficacious in treatment of hair loss. It shows better effects when started early, and the effect is sustained for long-term use for up to 10 years.

Topical finasteride can be considered as a choice for hair density maintenance after initial improvement with oral finasteride, thus avoiding the need for using oral finasteride indefinitely.

SNIPPETS

- Alopecia is a psychologically damaging condition that results in intense emotional suffering.
- Finasteride is clinically proven to be effective in the treatment of AGA.
- Nutritional supplements play a vital role in promoting hair growth and preventing hair loss.

References


Skin biopsy of a fluid-filled vesicle on the great toe of foot. High-power view of the contents of the vesicle.

Biotin is one of the most crucial nutrients for preserving hair strength, texture, and function.

COAL TAR AND SALICYLIC ACID IN SCALP PSORIASIS

Scalp Psoriasis

Psoriasis of the scalp is known to be a frequently occurring condition. Scalp is considered to be the first site of involvement in approximately 25% of the patients with psoriasis. Around 75% of patients with chronic plaque psoriasis may present with scalp involvement. The sharply demarcated erythematous scaly lesions with white-silver scaling are the characteristics of scalp psoriasis. The quality of life can be seriously hampered by this condition, leading to a requirement of long-term treatment in most patients.

Coal Tar and Salicylic Acid in the Treatment of Scalp Psoriasis

Coal tar is considered to be an effective and a cheap treatment option for scalp psoriasis. Topical tar solution, such as Iranian picric carbolic (SPC) or liquor carbonis detergens (LCD), is the widely available choice, commonly used for scalp psoriasis. Newer preparations specifically meant for scalp psoriasis comprises of coconut oil and salicylic acid. Compound emollient tar solution with precipitated sulfur, salicylic acid, coconut oil, yellow soft paraffin and emulsifying wax and tar powders (containing LCD), Tawan 20 and salicylic acid in a pharmaceutical form. Compound emollient tar needs to be applied once at night and washed off in the morning with the use of coal tar shampoo. Coal tar shampoos have 1–20% coal tar extract. They should be used twice a week. Newer preparations specifically meant for scalp psoriasis comprises of coconut oil and salicylic acid. Compound emollient tar solution with precipitated sulfur, salicylic acid, coconut oil, yellow soft paraffin and emulsifying wax and tar powders (containing LCD), Tawan 20 and salicylic acid in a pharmaceutical form. Compound emollient tar needs to be applied once at night and washed off in the morning with the use of coal tar shampoo. Coal tar shampoos have 1–20% coal tar extract. They should be used twice a week.

Salicylic acid to 10% is associated with a pronounced keratolytic effect and is used in combination with other topical modalities. Salicylic acid formulated in an ointment forms is easy to wash off.

References

Biotin is one of the most crucial nutrients for preserving hair strength, texture, and function.

**Role of nutritional supplements in hair growth**

- **Amino acids**
  - Chemically, hair comprises 97% protein and thus is primarily made up of amino acids, which are the building blocks of proteins. 1. Methionine aids in preventing hair fall and promoting blood supply to the scalp. Thus, it can considerably strengthen the hair structure. 2. Tyrosine, the amino acid prevalent in vegetables and legumes, inhibits 5 α-reductase type II.

- **Gamma-linolenic acid**
  - Gamma-linolenic acid has shown to stop the thinning of hair.

- **Biotin**
  - Biotin plays an important role in a number of enzymatic reactions within the body, and is required for proper metabolism of protein, fat, and carbohydrates. Over a period of time, poor metabolism of nutrients can lead to undernourished hair follicle cells. Biotin deficiency can result in hair loss. A study conducted at Harvard University suggested that biotin is one of the most crucial nutrients for preserving hair strength, texture, and function.

- **Vitamin B₆, niacin and pantethic acid**
  - Reduced levels of vitamin B₆, niacin, and pantethic acid can result in the undernourishment of hair follicle cells.

**Treatment**

**Folic acid**
- A reduction in folic acid may contribute to decreased hair follicle cell division and growth. Folic acid is also important for the maintenance of healthy menstruation levels in the body. Signs of folic acid deficiency are anemia, fatigue, and graying of hair.

**Inositol**
- Inositol is a precursor for phospholipids. Phospholipids are considered to be important for healthy hair follicle development.

**Finasteride in androgenetic alopecia**
- Finasteride is the first and only oral medication to be approved by the Food and Drug Administration in treatment of male-pattern hair loss. Finasteride is a specific inhibitor of type II 5 α-reductase, which converts testosterone into dihydrotestosterone that affects the hair follicle regression. By decreasing scalp tissue levels of dihydrotestosterone, finasteride aids in suppressing male-pattern hair shedding.

Various publications have listed the usefulness of this drug in the treatment of androgenetic alopecia. A systematic review of 12 studies has presented moderate quality evidence which suggests that the daily use of oral finasteride assists in increasing hair count. Long-term use of finasteride for up to 5 years has shown to reduce the likelihood of developing further visible hair loss. A study of 270 men with high levels of serum 5 α-dihydrotestosterone noted that initiating the drug in younger patients had a better response. A double-blind study conducted recently revealed that the therapeutic effects of 1% finasteride gel applied twice daily and oral finasteride, 1 mg daily were relatively similar. Topical finasteride can be considered as a choice for hair density maintenance after initial improvement with oral finasteride, thus avoiding the need for using oral finasteride indefinitely.

A study conducted to evaluate the effects of finasteride on hair weight and count over 4 years in men with AGA revealed good results of finasteride over placebo in terms of hair count and hair weight as shown in Figure 12.

These studies revealed that the drug is efficacious in treatment of hair loss. It shows better effects when started early, and the effect is sustained with long-term use for up to 10 years.

**Topical finasteride can be considered as a choice for hair density maintenance after initial improvement with oral finasteride, thus avoiding the need for using oral finasteride indefinitely.**

**COAL TAR AND SALICYLIC ACID IN SCALP PSORIASIS**

**Scalp Psoriasis**
- Psoriasis of the scalp is known to be a frequently occurring condition.
- It contains fungal hyphae, fungal spores and neutrophils. Fungal hyphae are filamentous and fungal spores are roundish structures. Neutrophils are present as a main feature.

**References**
9. Q: What do you think of the findings in the stratum corneum?

**Toxicity in the Liver**

**Psychological factors**

**Quiz Answer**

- **Erythroderma**
- **Subcorneal Stratum**
- **Am J Clin Dermatol.**

**Treatment**

- **Folic acid**
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These studies revealed that the drug is efficacious in treatment of hair loss. It shows better effects when started early, and the effect is sustained with long-term use for up to 10 years.

- **Topical finasteride can be considered as a choice for hair density maintenance after initial improvement with oral finasteride, thus avoiding the need for using oral finasteride indefinitely.**

**SNIPPETS**

- **Allopoea is a psychologically damaging condition that results in intense emotional suffering.**
- **Finasteride is clinically proven to be effective in the treatment of AGA.**
- **Nutritional supplements play a vital role in promoting hair growth and preventing hair loss.**

**References**
Case Profile
A 47-year-old woman presented to the clinic with complaints of excessive hair loss and thinning of hair from the past one and a half year; no family history of hair loss was noted. She had been prescribed minoxidil solution 2%, which she used for a few months but failed to get any improvement, and therefore, subsequently discontinued it. Under the impression of female androgenetic alopecia, a punch biopsy was done, and histopathological evaluation was done. She was referred to the dermatologist to assess her condition. The patient was a known case of anemia, anorexia nervosa, bulimia, and kwashiorkor. Vitamins, minerals, and other nutritional supplements, including iron and calcium, were prescribed. The patient was also referred to a dietician for a thorough nutritional assessment, which revealed that the patient was in a malnourished state.

On physical examination, diffuse thinning on the majority of scalp was noted. A hair pull test was positive, with more than 8 telogen-appearing hairs pulled on 4 attempts. Digital microscopic evaluation displayed about 80% miniaturization of follicles, with around 10% miniaturization on frontal scalp. All laboratory tests, including androgen levels, were found to be within the reference range. The differential diagnoses of female androgenetic alopecia included telogen effluvium, diffuse alopecia areata, and diffuse androgenic alopecia. A punch biopsy revealed 22 hair follicles: 13 terminal, 6 vellus, and 3 telogen/canterior hair follicle. The terminal to vellus ratio was found to be 1.6 to 1. The peribulbar or peri-bulbar hair follicles were noted. The biopsy showed a marked increase in the number of vellus hairs, the terminal to vellus ratio was 1.6 to 1. The patient was diagnosed with female androgenetic alopecia.

The patient was referred to the dermatologist for further evaluation and treatment. The patient was prescribed finasteride 1.25 mg and vitamins. The patient was also referred to a dietician for a thorough nutritional assessment. The patient was also referred to a psychologist for psychological evaluation.

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Discussion
Female pattern hair loss (FPHL) is a broad term used for the reduction in central scalp density, which is often seen after puberty in females. Although FPHL does not cause any serious health concerns, it is distressing and is reported to affect approximately 50% of females over 50 years of age. Some FPHL-affected females are observed to respond to anti-androgens or 5α-reductase inhibitors. This is indicative of an androgen-related pathology in a small group of females. Some studies have shown that FPHL is associated with a reduced terminal to vellus ratio, higher peribulbar vellus hairs, and a higher scalp blood flow. The studies focusing on the prevalence of alopecia in females are shown in Table 1. Aforementioned studies have mostly used generally accepted scales of classification.

Table 1: Prevalence of alopecia based on previous studies.

<table>
<thead>
<tr>
<th>Study, Year</th>
<th>Design</th>
<th>Study population</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch et al. 2001</td>
<td>Clinical</td>
<td>377 females, 18–59 years pre/postmenopausal</td>
<td>6/38</td>
</tr>
<tr>
<td>Pothoven et al. 2002</td>
<td>Clinical</td>
<td>312 males, 18–49 years</td>
<td>39</td>
</tr>
<tr>
<td>Severini et al. 2003</td>
<td>Population</td>
<td>2380 males, 18–65 years</td>
<td>75</td>
</tr>
<tr>
<td>Chumyuk et al. 2004</td>
<td>Population</td>
<td>254 males, 18–49 years</td>
<td>55</td>
</tr>
<tr>
<td>Groover et al. 2005</td>
<td>Clinical</td>
<td>2445 males, 20–75 years</td>
<td>31</td>
</tr>
</tbody>
</table>

It is known that nutrition influences hair loss and hair conditions, as illustrated by the hair problems associated with disorders caused by severe malnutrition, such as anemia, anaemia, nervosa, bulimia, and kwashiorkor. Vitamins, minerals, and other nutrients are frequently used in a large range of products that claim to be efficient against hair loss.

A study was conducted by Le Floch et al., to evaluate the efficacy of a nutritional supplement on hair loss and hair condition versus control. A total of 120 healthy female volunteers, aged 18–65 years and presented with stage 1 hair loss, were recruited in the study. After 6 months of treatment, photograph assessment demonstrated a superior improvement in the supplemented group (p > 0.01). A large majority of supplemented subjects reported a reduction in hair loss (89.3% of subjects at 6 months), as well as an improvement in hair diameter (66.2%) and hair density (87.7%).

Thus, nutritional supplements along with finasteride provide an effective treatment option for androgenetic alopecia.

References

Why alopecia needs to be taken seriously?
Alopecia is a psychologically damaging condition that results in intense emotional suffering, and causes personal, social, and work-related problems. It is observed that they also experience poor quality of life, lower self-esteem, and poor body image.

Factors contributing to alopecia
There is no general agreement regarding the main factors behind hair loss. There may be one or multiple factors resulting in hair loss, which are summarized as follows.

- Deficient nutrition
- Emotional stress
- Hormonal changes
- Medications
- Genetic factors
- Autoimmune disorders
- Telogen effluvium
- Androgenetic alopecia
- Alopecia areata
- Trichotillomania
- Traction alopecia
- Seborrheic dermatitis
- Psoriasis
- Lichen planus

Alopecia is a psychologically damaging condition that results in intense emotional suffering, and causes personal, social, and work-related problems. Disorders are found to be more common in individuals with alopecia than in the general population. This suggests that people with alopecia are at a higher risk for developing a serious depressive episode, anxiety disorder, paranoid disorder, or social phobia. It is observed that they also experience poor quality of life, lower self-esteem, and poor body image.