

Nutraceuticals



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KEYWORDS

• Alopecia • Hair loss • Supplements • Nutrition • Nutraceuticals

KEY POINTS

- Several herbal products and vitamins have beneficial effects when used as oral supplements to treat hair loss.
- Numerous trials have demonstrated the clinical efficacy of proprietary nutraceutical products for treating hair loss in women and men.
- The overall safety of these nutraceuticals is very good.

INTRODUCTION

Although there are drugs approved by the US Food and Drug Administration for treating male and female pattern hair loss, some individuals are more comfortable using nonprescription medications. Frequently, they assume that these products are safer with fewer side effects than prescription drugs. Because the process of hair loss is affected by both intrinsic and extrinsic factors, companies are now expanding research efforts with the goal of creating natural supplements. In addition, they are combining over-the-counter ingredients to promote hair growth and regrowth for all forms of hair loss, including nonscarring and scarring alopecia.

It is increasingly clear that hair loss has a multifactorial etiology that includes an imbalance of the body's immune system and defects in several metabolic pathways. Internal triggers include diet and nutrition, the natural aging process, genetic hormones (dihydrotestosterone), and stress hormones (cortisol). External factors include extreme training and exercise, pollution, hair products and styling, and UV exposure. These triggers can cause an increase of free radicals, oxidative stress and microinflammation at the site of hair follicles. Combined, these factors can lead to dysregulation of complex follicle biology and immunology, as well as release of proapoptotic, profibrotic and proinflammatory cytokines and reactive oxygen species, all of which promote follicular regression, growth inhibition, and disruption of follicle stem

cell cycling.^{1–6} Because the hair follicle is closely regulated by very specific molecules released to initiate hair growth, regression, and rest, any disruption or dysregulation can tip the scale toward regression and hair loss.

The old adage, “you are what you eat” was never more appropriate than when discussing hair health. As individuals are living longer, it becomes increasingly important to understand the importance of diets rich in amino acids and certain botanicals, as well as the benefits of oral supplementation. The objective of this article was to describe the beneficial ingredients used to treat hair loss and the clinical evidence supporting their use.

HAIR SUPPLEMENT INGREDIENTS

Ashwagandha

This plant has its origins in Ayurvedic medicine used thousands of years ago, when it was thought to create balance in the body, increase energy, and improve stress resistance. Ashwagandha is an adaptogenic botanic containing steroidal lactones (withanolides) that can interact with steroid receptors by mimicking certain corticosteroids, thereby modulating cortisol levels and improving the stress response.^{1,2}

Astaxanthin

Astaxanthin is a carotenoid that gives salmon and other seafood their pink color. As an antioxidant, it is 6000 times more potent than vitamin C, 550

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times more potent than green tea, and 550 times more potent than vitamin E.³ Like all antioxidants, it decreases oxidative stress levels in mitochondria while decreasing proinflammatory cytokines such as IL-8.^{4,5} Called the cell membrane antioxidant, it protects against oxidative mitochondrial dysfunction, allowing hair follicles to advance into growth cycle more readily. Oral astaxanthin is derived from the red algae *Haematococcus pluvialis* and it has been shown to improve the appearance of aging skin.^{6,7}

Marine Collagen

Hydrolyzed marine collagen helps to build the structural integrity of the hair follicle and its environment. Hydrolyzing protein allows for lower molecular weight and better bioavailability, as well as improved diffusion of nutrients. It has been shown to have beneficial effects on aging skin.⁸

Turmeric (*Curcuma longa*)

Turmeric has anti-inflammatory, antimicrobial, antioxidant, and antineoplastic properties.⁹ The active component of turmeric is curcumin, believed to be a 5 α -reductase inhibitor that prevents conversion of testosterone to dihydrotestosterone. It inhibits nuclear factor- κ B, proapoptotic inflammatory cytokines, tumor necrosis factor- α , and IL-1, which can induce follicular regression, as well as being (17–18 nutrafol reference) a free radical scavenger.¹⁰ Oral and topical turmeric and curcumin products and supplements can provide therapeutic benefits for skin health.¹¹

Red Clover (*Trifolium pratense*)

Red clover and other legumes are a rich source of the flavonoid biochanin A, a known inhibitor of 5 α -reductase, which converts testosterone to 5 α -dihydrotestosterone.¹²

Maca Root (*Lepidium meyenii*)

Maca root is found in Peru, where it has been cultured for centuries. It is a rich source of essential amino acids, fatty acids, and other nutrients, including vitamin C, copper, iron, and calcium.¹³ Other constituents include glucosinolates, macaenides, macaenes, alkaloids, and sterols.¹⁴ The imidazole alkaloid lepidilins has been identified as the key active. It seems to improve the balance of endogenous sex hormones and increased fertility by its effect on 17 β -hydroxysteroid dehydrogenase.¹⁵ Maca root also has adaptogenic effects, reducing stress-induced elevated levels of corticosterone.¹⁶ It may, therefore, help to

decrease hair loss and miniaturization and increase hair growth.

Methylsulfonylmethane

Methylsulfonylmethane is widely found in food and beverages such as fruits, vegetables, grains, coffee, and cow's milk.¹⁷ Methylsulfonylmethane has anti-inflammatory, antioxidant, and free radical scavenging activity and can modulate immune function.¹⁷ A controlled study demonstrated methylsulfonylmethane significantly improved facial wrinkles, skin firmness, elasticity, and hydration.¹⁸

Amino Acids (*L*-cysteine, *L*-Methionine, and Taurine)

The most prevalent amino acids in keratin are *L*-cysteine and *L*-methionine, which are critical precursors for keratin hair protein synthesis. Because hair loss may be related to poor nutrition, it may be highly beneficial to provide supplemental amino acids.¹⁹ Methionine has antioxidant activity that can protect protein²⁰ and is also vital for the synthesis of the precursor to collagen called procollagen. Additionally, cysteine is essential to produce the powerful antioxidant glutathione. Thus, cysteine also indirectly assists with protecting hair follicles from oxidative stress.

In vitro studies showed taurine is taken up by the connective tissue sheath, proximal outer root sheath, and hair bulb and promoted hair survival preventing transforming growth factor- β 1-induced damage on hair follicles.²¹ Several studies have confirmed that cysteine supplementation can decrease the symptoms of androgenic alopecia.²²

Piperine (*Piper nigrum*)

Piperine is derived from black pepper. It has significant and dose-dependent immunomodulating, anti-inflammatory, antioxidant, and anticancer activity.^{23,24} Piperine has demonstrated 5 α -reductase inhibitory activity and increased hair growth in an animal model.²⁵ It possesses direct antioxidant activity against various free radicals, protecting tissues from peroxidative damage.²⁶ Piperine can also enhance the bioavailability of other nutraceuticals. For example, it can increase the antioxidant, anti-inflammatory, antimicrobial, and antineoplastic effects of curcumin.²⁷

Saw Palmetto (*Serenoa repens*)

Saw palmetto is derived from the fruit of a small palm tree. It inhibits 5 α -reductase and prevents the conversion of testosterone to dihydrotestosterone.²⁸ A small placebo-controlled, double-blind

study assessed the benefit of saw palmetto for treating androgenetic alopecia.²⁹ The results demonstrated that 60% of study patients dosed with the active study formulation were rated as improved.

Horsetail (Equisetum spp.)

An extract from 1 species of horsetail has been shown to have high inhibitory activity against 5 α -reductase, IL-6 secretion, and lipid peroxidation.³⁰

Minerals (Iron and Zinc)

Iron deficiency is the most common nutritional deficiency³¹ and is common among women with hair loss.^{32,33} Iron supplementation is indicated in patients with iron or ferritin deficiency and hair loss.³¹ Zinc deficiency is also associated with hair loss, which can be reversed with zinc supplementation.³⁴ In 1 study, 66.7% of patients with alopecia areata and low zinc levels responded to treatment with zinc gluconate supplementation.³⁵

Vitamins

Because vitamins play an essential role in the hair cycle and immune defense system, hair loss can occur as a result of nutrient deficiency.^{36,37} These include vitamins A, B, C (ascorbic acid, acerola), D, E (tocotrienols), biotin, and folic acid. Patients with alopecia have shown lower levels of endogenous antioxidants and an increase in metabolites of lipid peroxidation.³⁸ Tocotrienols decrease oxidative stress and prevent lipid peroxidation secondary to their superior lipid solubility. Although a link can be demonstrated between some vitamin deficiency and hair loss, the ability of vitamin supplementation to restore hair is less clear.³¹

PROPRIETARY SUPPLEMENTS FOR HAIR LOSS

Several companies have combined these nutritional ingredients to create unique and effective supplements for treating hair loss. In a largely unregulated supplement industry, it is as difficult for physicians as it is for patients to discern clinical efficacy, standardization of dosing, or clean sourcing of ingredients. These nutraceuticals contain ingredients that work on multiple levels of intrinsic and extrinsic causes of hair loss. The following clinical data support the use of these products.

Nutrafol

Ingredients

- Ashwaganda
- Biocurcumin

- Tocotrienols
- Saw palmetto
- Piperine
- Marine collagen

Nutrafol is a nutraceutical supplement with 3 core formulations, all of which contain a proprietary complex of highly purified, bio-optimized botanicals containing exact standardized dosages of phytoactives with shown multimodal clinical efficacy against dihydrotestosterone, inflammation, reactive oxygen species, mediators of psychosocial stress, and intermediary signaling cascades.^{39,40} Nutrafol took advantage of advances in biotechnology, using solvent-free methods to extract the most potent photoactive plant parts and standardizing them to specific dosages, while bio-optimizing for improved bioavailability and absorption.

Nutrafol's formulations are personalized based on age and sex. The 3 core formulations include Men's, Women's and Women's Balance, which is the most recent formulation for women in perimenopause, menopause, and after menopause. The men's and women's formulas contain a signature Synergen Complex with ingredients specifically selected based on their pharmacology and multimodal activity against the multiple molecular and environmental causative factors of hair loss, described in detail by Farris and colleagues in 2017.³⁹

Patients with alopecia have been shown to have lower levels of endogenous antioxidants and an increase in metabolites of lipid peroxidation.³⁸ Several botanic ingredients in Nutrafol formulations have antioxidant properties. The tocotrienol-rich tocotrienol/tocopherol complex in the Synergen Complex was clinically shown to improve hair growth, likely by reducing oxidative stress in the scalp.^{39,41,42} A unique feature in all Nutrafol formulations is the addition of phytoactive stress adaptogens, presenting the only available option for addressing psychosocial stress and its impact on hair follicles.^{39,43} Sensoril ashwagandha in Nutrafol formulations is standardized to a higher percentage of withanolides and was shown clinically to significantly decrease elevated cortisol levels in chronically stressed adults with daily administration.⁴⁴

The Women's Balance formula contains Synergen Complex plus, which is optimized with dosages and additional ingredients that specifically address the hormonal and oxidative changes that occur during the menopausal transition in life and afterward. The hair follicle is sensitive not only to androgens, but also to estrogens, progesterone, and the ratios of these numerous

hormones relative to each other. Decrease in estrogen during menopause is associated with a decreased rate of hair growth, hair diameter and density, as well as percentage of anagen hairs.⁴⁵ Although estrogen and progesterone decrease rapidly after menopause, levels of androgens decrease slowly, resulting in a relative androgen dominance—an imbalance that contributes to the increased appearance of hair loss during this time in women.⁴⁶ To counter the extra effects of androgens during menopause in women, Women's Balance is formulated with significantly more saw palmetto. Additional ingredients include organic maca root and astaxanthin. Traditionally known for its hormone balancing properties, maca is likewise an adaptogen that helps modulate the hypothalamic–pituitary–ovary axis through a variety of clinically shown effects on production of endogenous sex hormones.^{40,43,47} In a clinical trial, the administration of maca to perimenopausal women for 2 months significantly improved endogenous production of estrogen, follicle-stimulating hormone, progesterone, and adrenocorticotrophic hormone levels, as well as mitigated menopausal symptoms.⁴⁷ Astaxanthin is a very potent antioxidant derived from micro algae and included in the formulation to support against age-related decrease in antioxidant defense mechanisms and increased oxidative stress in postmenopausal women.⁴⁸

The efficacy of Nutrafol's complete formulations has been clinically tested in published and ongoing studies. In a recent randomized, double-blind, placebo-controlled trial, daily intake of Nutrafol Women's capsules was shown to significantly improve several hair growth and hair quality parameters in women with self-perceived thinning.

In this 6-month randomized, double-blind, placebo-controlled study, enrolled patients were randomized to receive Nutrafol or placebo for 90 days. The primary end point in this study was the change in the number of terminal and vellus hairs based on phototrichograms obtained through macrophotography analysis of an area of the scalp. Daily administration of Nutrafol increased the baseline number of terminal and vellus hairs in the target area at days 90 and 180 to a significantly greater extent than placebo. A blinded investigator assessment revealed significant improvements in hair growth and overall hair quality. A significant percentage of patients taking Nutrafol also reported improvement in hair growth, volume, thickness, and hair growth rate, as well as decreased anxiety and other wellness parameters. There were no reports of adverse events.

A recently published collection of case reports demonstrated that the efficacy of Nutrafol

Women's formula alone or in combination with other regimens is showing success without ethnic barriers, specifically in darker skin types of African descent.⁴⁹ In a mixed ethnicity study of 87 men and women of Caucasian, Asian, African American, and Hispanic descent, taking respective Nutrafol Men and Nutrafol Women capsules, a significant percent saw improvement in scalp coverage and thickness of hair, as well as other parameters like less shedding and growth. Specifically, 75% of the African American group saw improved hair growth and thickness after 6 months of daily use.⁵⁰ In a study of 30 women with self-perceived hair thinning in perimenopause, during menopause, and after menopause, daily administration of Nutrafol Women's Balance resulted in 73% seeing more scalp coverage and less shedding by 6 months, which increased to 80% and 90% by 9 months, respectively. Furthermore, 80% saw new hair growth by 6 months, increasing to 93% by 9 months. Additionally, 90% reported improvement in texture by 9 months. The phytoactives in Nutrafol have preserved bioactivity after traction with solvents that are bioavailable to the body and free of additives and toxins.

An interim analysis of a 6-month randomized placebo-controlled study was completed recently. The results showed that the daily intake of the nutraceutical supplement resulted in statistically significant improvements for the active treatment group for the number of terminal, vellus, and total hairs and hair shedding after 90 days and further improvement after 180 days (for each, $P < .005$) among women going through menopausal transition.⁵¹ A representative male patient is shown at baseline and after 6 months of treatment in **Fig. 1**. A female patient is shown after treatment at 3 and 6 months in **Fig. 2**.

Viviscal

Ingredients

- AminoMar (28% marine protein complex)
- L-Cysteine and L-methionine
- Vitamin C
- Apple extract (procyanidin B₂)
- Biotin
- Fumed silica

After studying the Innuits, a Scandinavian professor determined their excellent skin and hair quality was the result of their fish- and protein-rich diet, leading to the development of a marine protein-derived proprietary hair thickening supplement. The beneficial effects of this product have been documented in numerous *in vitro* studies and clinical trials.

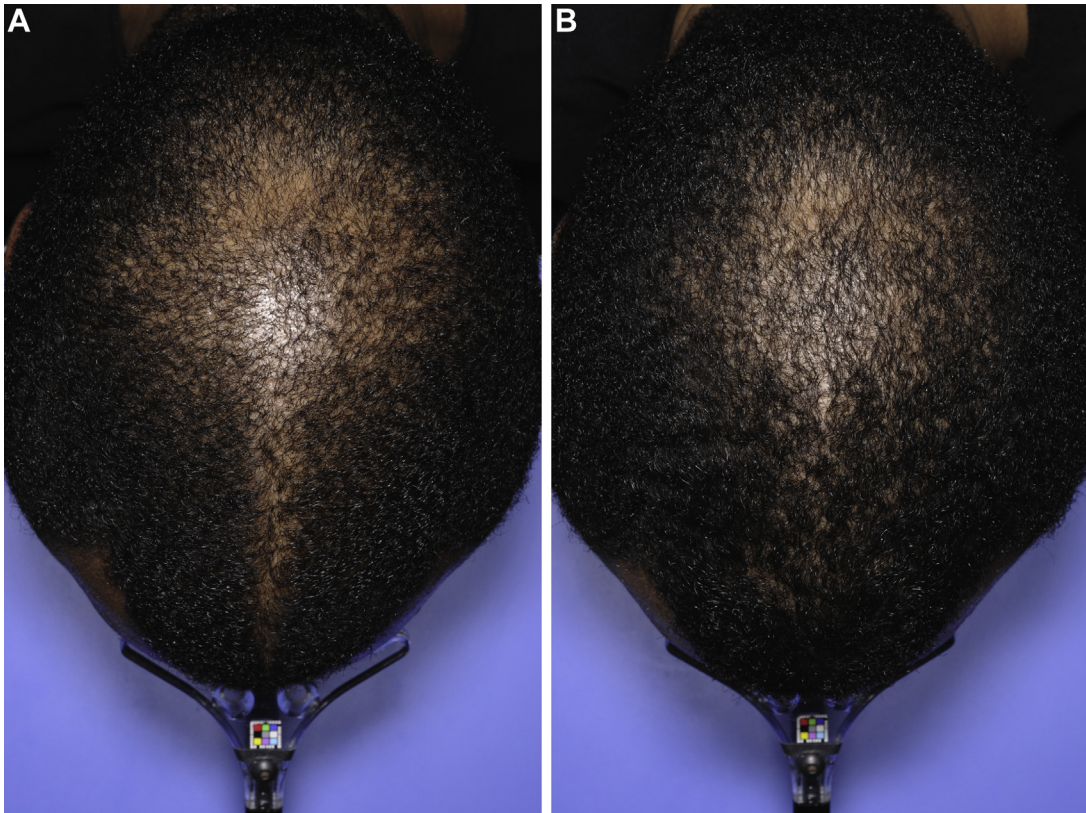


Fig. 1. (A, B). Male patient treated with Nutrafol. Baseline (A) and after 6 months of treatment (B).

Viviscal is an oral marine supplement designed to promote hair growth in women with temporary thinning hair (Viviscal Ltd, Ewing, NJ). This product comprises the key ingredients AminoMar C marine complex (a proprietary blend of shark and mollusk powder derived from sustainably marine sources), *Equisetum arvense* (a naturally occurring form of silica), *Malpighia glabra* (acerola cherry providing vitamin C), biotin, and zinc.

Studies of the dermal papilla, or control center of the hair follicle, demonstrate cell proliferation and cell signaling triggered by Viviscal, leading to a new anagen growth phase. Doubling the alkaline phosphatase in each dermal papilla helps to support healthy hair growth and increased cellular communication.

Viviscal originated as products containing glycosaminoglycans extracted from marine fish⁵² and cartilage polysaccharides.⁵³ Two early double-blind studies assessed the beneficial effects of these ingredients in women with photo-damaged skin.^{52,53} In addition to improvements in skin quality, there were improvements in hair and nails. A subsequent double-blind study specifically assessed the effects marine extracts and a silica compound on men with androgenic

alopecia.⁵⁴ Patients treated with the oral supplement achieved a mean 38% increase in nonvellus hairs and 95% showed a clinical and histologic cure.

The initial study with the current Viviscal formulation was an open-label pilot study.⁵⁵ Female patients with self-perceived thinning hair associated with poor diet, stress, hormonal influences, or abnormal menstrual cycles were enrolled. At baseline, the mean number of shed hairs was 69.1, decreasing to 61.0 and 37.0 after 4 and 10 weeks of treatment, respectively.⁵⁵ At week 10, most patients reported beneficial effects in overall hair volume, scalp coverage, hair thickness, softness, shine, decreased hair shedding, and improved overall skin health.

Based on these positive results, several randomized, placebo-controlled, double-blind studies further evaluated the ability of Viviscal to increase hair growth using objective measures. In the first study, healthy adult women with self-perceived thinning hair were randomized to receive Viviscal or placebo twice daily for 180 days.⁵⁶ A 2 cm² area of scalp was selected for hair counts at baseline and after 90 and 180 days of treatment. Among Viviscal-treated

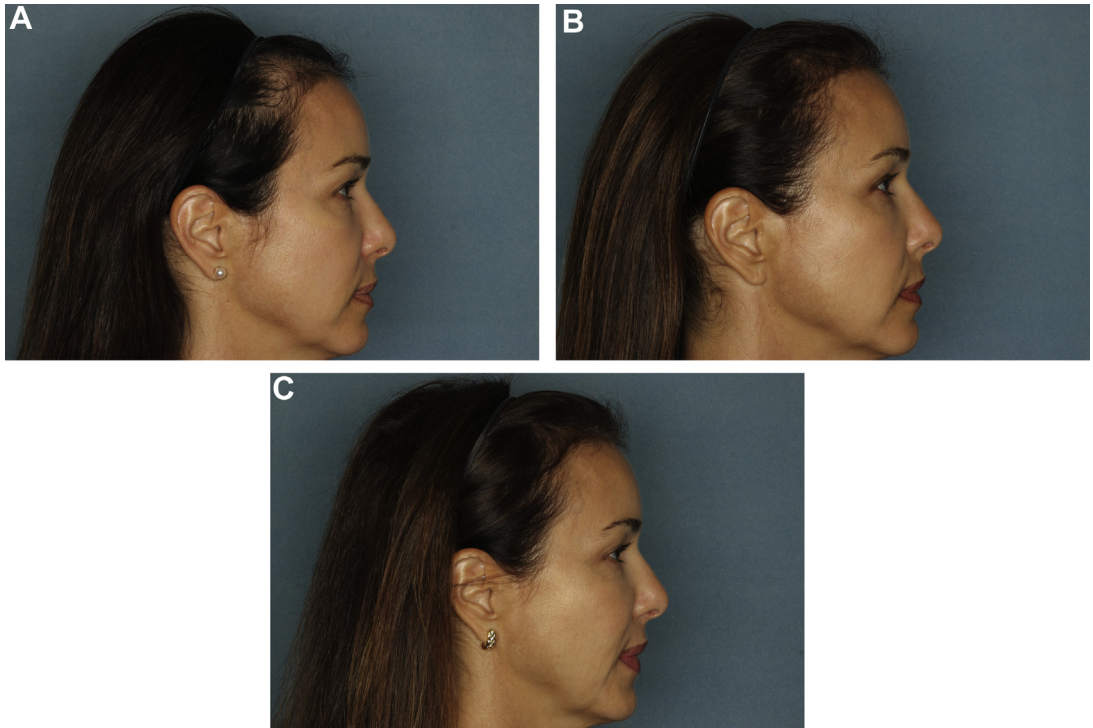


Fig. 2. (A–C). Female patient treated with Nutrafol. Baseline (A) and after 3 (B) and 6 months of treatment (C).

patients, the mean (standard deviation) number of baseline terminal hairs was 271.0 (24.2) at baseline, increasing to 571 (65.7) and 609.6 (66.6) after 90 and 180 days of treatment, respectively, while remaining essentially unchanged among patients treated with placebo.⁵⁶ Viviscal-treated patients reported significantly greater improvements in overall hair volume, scalp coverage, and hair body thickness after 90 days and also hair shine and skin smoothness after 180 days.

The results of 2 other double-blind, placebo-controlled studies confirmed the ability of Viviscal to promote hair growth and increase hair diameter in larger cohorts of women with self-perceived thinning hair.^{57,58} In each study, healthy adult women were enrolled and randomized to receive Viviscal or placebo every morning and evening and were evaluated at baseline and after 90 days⁵⁷ or 90 and 180 days of treatment.⁷ An area of scalp was again selected for phototrichogram analysis. Among patients treated with the active product, there was a significant increase in the mean standard deviation number of terminal hairs from 178.3 (7.8) at baseline to 235.8 (18.4) after 90 days⁵⁷ and from 189.9 (15.2) at baseline to 297.4 (96.1) and 341.0 (60.9) at 90 and 180 days, respectively.⁵⁸ Similarly, there was a significant increase in the number of vellus hairs in patients receiving Viviscal.^{57,58} In contrast, there were no

improvements in placebo-treated patients. Improvements in a 90-day self-assessment questionnaire included overall hair growth and hair volume, scalp coverage, thickness of hair body, hair strength, growth of eyebrow hair, and overall skin health.^{57,58} Viviscal also produced improvements in a 180-day self-assessment questionnaire and quality of life questionnaire.⁵⁸

An additional 180-day double-blind, placebo-controlled study added a shed hair count analysis and a phototrichogram-based hair fiber diameter analysis as efficacy end points.⁵⁹ An area of the scalp was again selected for 2-dimensional digital images and trichoanalysis. Patients were randomized to receive 1 tablet of the active treatment or a placebo 3 times daily and evaluated at baseline and after 2 days and 3 and 6 months of treatment. Among patients randomized to Viviscal, mean hair shedding was significantly reduced from 52.1 (59.5) at baseline to 42.6 (45.2) at 3 months and 42.7 (41.7) at 6 months. The mean hair diameter of vellus-like hair showed a small but significant increase among patients treated with Viviscal after 3 and 6 months of treatment. There was no improvement among placebo-treated patients. Improvements after 6 months of treatment are apparent in the patient shown in **Fig. 3**.

The beneficial effects of Viviscal for restoring thinning hair has also been demonstrated in other

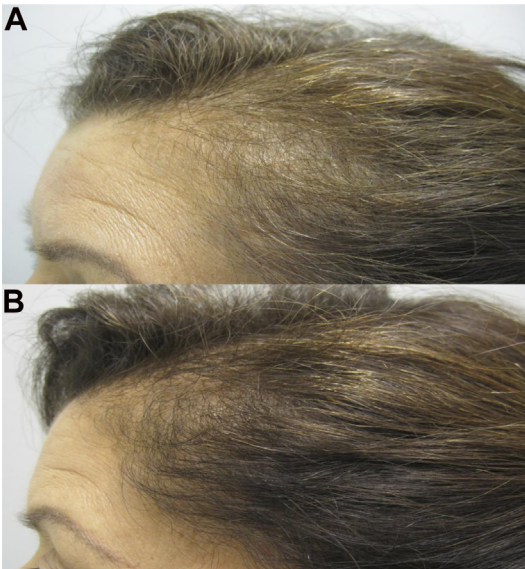


Fig. 3. (A, B) Female patient treated with Viviscal. Baseline (A) and after and 6 months of treatment (B).

patient populations, including men. A double-blind, placebo-controlled study assessed the beneficial effects of a new formulation for men.⁶⁰ Healthy patients with thinning hair, including individuals with androgenic alopecia were randomized to receive Viviscal Man or placebo every morning and evening and were evaluated at baseline and post-treatment days 90 and 180. **Fig. 4** demonstrates improvements in a male patient after 3 and 6 months of treatment.

Like previous studies, a predesignated target area on the scalp was chosen for digital imaging and trichoanalysis. This study introduced the hair pull test,⁶¹ which was performed on the right and left parietal, frontal, and occipital areas of the scalp at baseline and the day 180 visits. The mean (standard deviation) total hair count significantly increased from 162.2 (46.9) at baseline to 169.1 (43.4) and 174.9 (44.0) at days 90 and 180, respectively; the total hair density significantly increased from 159.7 (46.3) at baseline to 166.5 (42.7) and 172.2 (43.3) at days 90 and 180, respectively; the terminal hair density significantly increased from 121.9 (40.0) at baseline to 127.7 (39.21) and 130.3 (38.8) at days 90 and 180, respectively; and the hair pull test was significantly improved at days 90 and 180. There was no improvement in placebo-treated patients. Post-treatment questionnaires revealed significant overall improvement in quality of life and substantial overall satisfaction at day 180.

In an open-label study, the effects of Viviscal were also assessed in women of color.⁶² Study

patients with scarring alopecia, traction alopecia, or self-perceived thinning hair were treated with Viviscal twice daily and were evaluated at baseline and after 2 and 4 months of treatment.

Baseline quality of life questionnaires indicated the effects of thinning hair include embarrassment and diminished self-esteem. Substantial improvements were observed during the initial 2 months of treatment. Based on patient self-assessments, these changes included overall hair volume, scalp coverage, thickness of hair body, hair shine, and daily number of lost hairs.

Throughout these clinical studies, Viviscal demonstrated an excellent safety profile.

Lambdapil

Ingredients

- Saw palmetto
- L-cystine
- Biotin
- Taurine
- Zinc
- Sillicium (horsetail dry extract)
- Vitamins B₃, B₅, and B₆

A single randomized, double-blind, placebo-controlled trial assessed the efficacy of Lambdapil capsules for treating hair loss in female and male patients.⁶³ Enrolled patients had confirmed telogen effluvium or androgenetic alopecia and were randomized to receive Lambdapil or placebo twice daily for 6 months. Product efficacy was assessed using the hair pull test, phototrichogram procedure on a chosen area of scalp, and digital macrophotography. Hair volume and appearance were assessed by a dermatologist using a 7-point clinical score scale and patients responded to self-assessment questionnaires.

To perform the hair pull test, gentle traction is applied to a cluster of approximately 60 hairs on different areas and the number of extracted hairs is counted. In this study, the test was performed frontal, temporal, and occipital areas of the scalp. Growing anagen hairs should remain rooted, whereas telogen hairs come out easily. Normally, fewer than 3 telogen-phase hairs should come out with each pull; however, a loss of more than 9 hairs suggests telogen effluvium.

The number of hairs removed in the pull test decreased steadily for both groups, but was significantly less for the Lambdapil-treated group after 1 month. Among men, there was a significant 23.4% increase in the baseline anagen/telogen ratio in the Lambdapil group and which was significantly greater than placebo-treated patients. Among both women and men, most reported a

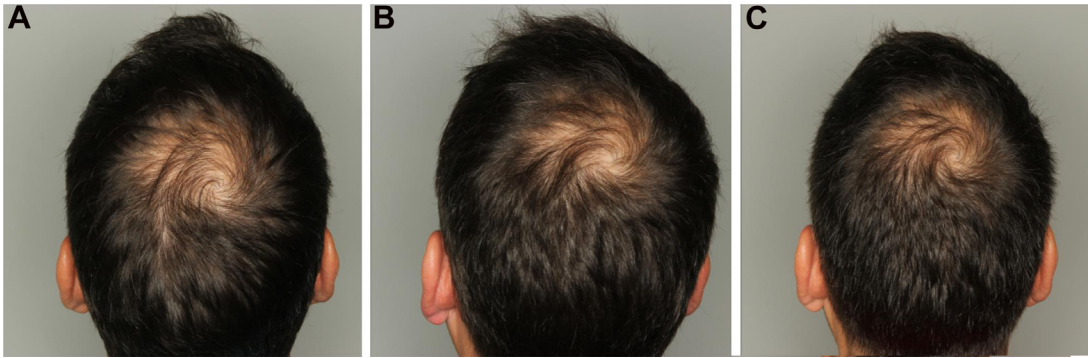


Fig. 4. (A–C) Male patient treated with Viviscal. Baseline (A) and after 3 months (B) and 6 months of treatment (C).

slight or moderate increase in hair volume, which was significantly greater in the Lambdapil group beginning at month 3 and month 6 (Fig. 5). Results from a quality of life questionnaire showed an improvement in baseline scores the Lambdapil-treated group, which was significant at 3 months. In contrast, quality of life scores decreased in the placebo group. Overall, Lambdapil-treated patients noticed a greater improvement in indicators of hair growth compared with the placebo group.

HRS-10 Hair Regrowth System

Ingredients

- Biomimetic peptide (acetyl tetrapeptide-3)
- Red clover extract (biochanin A)

To assess the clinical efficacy of this product, 30 healthy volunteers with mild-to-moderate hair loss enrolled in a 4-month randomized, placebo-controlled study.⁶⁴ As an inclusion criterion, less than 70% of all hair were required to be in the anagen phase. Patients were randomized to receive the medicated hair lotion containing clover extract (15 ppm biochanin A) and 300 ppm acetyl tetrapeptide-3 or placebo. Patients applied 20 drops of their assigned treatment to balding areas and gently massage it into the entire scalp. Each week, patients were provided a plastic bag to collect all hair found on their pillow, comb, and

clothes each day, which was returned for hair counts. Efficacy was objectively assessed using a digital trichogram and total hair density was on a shaved 1.8 cm² area of scalp.

Treatment with the test product significantly increased anagen hair density after 4 months of treatment, whereas there was no change among placebo-treated patients. The number of hairs in the anagen phase increased by a mean of 13% in the treated group versus a 2% decrease in the placebo group. The test product also decreased the mean telogen hair density by 29% versus a 23% increase in the placebo group. Accordingly, the baseline anagen/telogen ration significantly increased by 46% in the treated group while significantly decreasing by 33% in the placebo group. The overall tolerability of the topical formulations was excellent; no adverse events were reported.

Noncommercial Supplement

Ingredients

- Fish oil 460 mg
- Blackcurrant seed oil 460 mg
- Vitamin E 5 mg
- Vitamin C 30 mg
- Lycopene 1 mg

This 6-month, randomized, single-blind study assessed the efficacy of a nutritional supplement



Fig. 5. (A–C). Male patient treated with Lambdapil. Baseline (A) and after 3 months (B) and 6 months of treatment (C).

on patients with Ludwig stage 1 hair loss.⁶⁵ Control patients did not receive any product. The primary efficacy measure was change in hair density based on global digital images. The trichogram method was used to study hair loss and distribution of hair diameter. A self-assessment questionnaire queried patients about hair loss, hair density, and hair shaft condition (hair diameter, shiny appearance, volume, and softness) after 3 and 6 months.

After 6 months, 62.0% of treated patients had increased hair versus 28.2% in the control group. Improvement in hair density among treated patients was also significantly better in than control patients. At the end of the study, 88.6% of patients in the supplement group reported increased hair density of their scalp described as slight (13.9%), moderate (45.6%), and large (29.1%) versus 51.3% among control patients. The percentage of telogen hair decreased in both groups, but significantly more in treated patients. The proportion of nonvellus anagen hair was 79.7% at baseline increasing to 87.7% after 6 months versus no change in control patients. A significant increase in trichometer index at 6 months indicated an increase in hair density and thickness. All patients reported improvements in all assessment parameters and overall satisfaction was 92.4%.

SUMMARY

There are a variety of products used for hair growth. Some require a prescription, but many do not. As the science of hair growth advances and the demand for new products increases, it is likely that we will see many more products that will be marketed for hair regrowth.

DISCLOSURE

Nutrafol: Clinical Research Investigator; Viviscal: Clinical Research Investigator.

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