

Research Article

Antioxidants and Growth Factors in the Treatment of Alopecia with Injectables

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Abstract

Alopecia occurs due to several factors that may be intrinsic (organic) and or extrinsic (environmental) and may occur due to the lack of vitamin complexes, stress, hormonal disorders, genetic inheritance, chemical actions, drugs. In Brazil, the use of antioxidant shampoos and conditioners with hair stimulation has become a common practice. Androgenetic Alopecia (AGA) is the most common, leading to premature fillet unit aging, follicle micro-inflammation and inhibition of hair growth. (AGA) is a slow, painless and silent micro-inflammation triggered by factors such as climbing, chemical action caused by the use of cosmetics, body stress, hormonal disorders, menstrual irregularity, weight loss, systemic disease, use of medication to treat cancer and iron deficiency. Impair the hair fiber growth cycle (catagen, telogen and anagen). So, a diet low in protein and vitamins is worrying, it is necessary a supplement with multivitamins, today the drugs are shown as a watershed in the applications of alopecia, associating a programmed and targeted active induction technique. Microagulching plays an extremely important role with a combination of combined LED and Laser therapies. Calculated as complaints of men and women after exposure to some factors of daily life, reduced production of reactive factors that can cause disruption and fall. It is suggested nutritional supplements with antioxidant and anti-fall action, with potential inhibitor of hair aging and with fall and alopecia, as well as the use of growth factors. This study aimed to perform a literature review on scientific background and how aesthetic applications of antioxidants and growth factors in the treatment of alopecia.

Keywords: Antioxidant nutricosmetics; Growth factors for treatment of alopecia; Injectables for alopecia

Introduction

Hair changes that lead to alopecia due to several factors that may be intrinsic (organic) and extrinsic (environmental) and may occur due to the lack of vitamin complexes, stress, hormonal disorders, genetic inheritance, chemical actions, drugs [1]. In Brazil, the use of shampoos and conditioners with antioxidant action, hair loss with hair stimulation has become a common practice.

Androgenetic Alopecia (AGA) is the most common, leading to premature aging of the pilosebaceous unit, follicle micro-inflammation and inhibition of hair growth. (AGA) is a slow, painless and silent micro-inflammation triggered by factors such as climate change, chemical action caused by improper use of cosmetics, body stress, hormonal disorders, menstrual irregularity, weight loss, systemic disease, use of medication for cancer treatment and iron deficiency. It compromises the hair fiber growth cycle (catagen, telogen and anagen). Therefore, a diet low in protein and vitamins is worrying, requiring a supplement with multivitamins [2]. Today we have injectable monodoses for the treatment of Androgenetic alopecia, Seborrhic alopecia, we have the growth factor rich intradermal actives that will perform hair nutrition,

the nutricosmetics are used as a blend of Nutricosmetic actives known as pill food, and these associated actives a capillary lymphatic drainage oxygenating stimulant drainage 21.

Due to the complaints of men and women who after sun exposure and some factors of everyday life, increasing the production of reactive factors that can lead to disruption and fall. Nutricosmetic supplements with antioxidant and anti-fall action are suggested, with the potential to inhibit hair aging and hair loss and alopecia. As well as the use of growth factors associated with Led and lasers.

Thus, this study aimed to perform a literature review on the scientific foundations and aesthetic applications of antioxidants and growth factors in the treatment of alopecia.

Material and Methods

To achieve the proposed objective, a survey of relevant bibliographies in databases (Google Scholar; PubMed and in secondary sources in the Virtual Health Library (VHL) and LILACS (Latin American Literature in Health Sciences) and in SciELO (Scientific Electronic Library Online) article were used as search terms the words Antioxidants, growth factors, alopecia and were considered for this study (inclusion criteria) theses, dissertations, VictaLab site course, scientific articles, as well as books, published between 2000 and 2017 in Portuguese and English (or only in Portuguese).

Discussion

To have healthy hair we need balanced nutrition, it is also necessary to maintain health. Some vitamins are needed daily. Vitamins C, E, A, Beta Carotene, Foliates and Magnesium (important for collagen synthesis), nutrient and food intake influence the appearance of hair fiber and skin. According to Purba et al. [3] described that sun injuries are associated with poor eating habits. There are studies that ingestion

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of vitamin C, linoleic acid and daily use of multivitamins will improve the appearance of hair fiber. Preventive use of antioxidants will reduce hair damage by increasing the consumption of fruits, vegetables that are antioxidant energy sources.

Nutrient intake with antioxidant action plays an extremely important role in the inhibition of alopecia [4,5]. According to Cosgrove et al. [6] factors that lead to alopecia as: smoking patients, age, sun exposure, and menopause, lose body mass by fast diets, causes fall. With the use of supplements, healthy living, energy intake and multivitamin doses, vitamin C, D3, B2, K2, TGP has found excellent results in the appearance of hair fiber with fruit consumption.

Those who use fat (butter, margarine, lactides) and high carbohydrates have older skin and more damaged hair requiring supplementation of glycosamides (pool of amino acids, minerals and antioxidants). According to Cosgrove et al. [6] and Murad and Tabibian [7], the oral supplementation of nutricosmetics and injections mentioned does not replace healthy eating; the dietary supplement inhibits the capillary dehydration and the breakage or breakage of the capillary fiber 21.

The antioxidants used in the skin have been carried out numerous studies, the cutaneous application of α -lipoic acid, in order to minimize the harmful effects of UV radiation. Studies by Podda and colleagues have concluded that α -lipoic acid is effective in protecting against the loss of skin antioxidants. The authors used cultures of keratinocytes protected initially with tocopherol and ubiquinol, verifying that after exposure to UV radiation, the levels of these antioxidants decreased. Thus, in order to preserve antioxidant levels, the authors increased α -lipoic acid, observing the maintenance of antioxidant levels in cell cultures, with a decrease in the levels of reactive species present, as well as a prevention of oxidative stress.

However, studies by Segall et al. [8] Aimed at evaluating the stability of α -lipoic acid in a cutaneous formulation containing vitamin (E, A) showed that despite its low stability. In the formulation and its rapid degradation its use was effective.

According to Professor Dr Nelson Maurício, nutrient-based supplementation leads to increased yarn rate in the anagen phase and improves overall appearance in healthy women with excessive hair loss. Intake of vitamins and minerals promotes beneficial impact on the health of the hair, helping to reduce hair loss and brittle and opaque appearance [9].

Healthy looking hair is a sign of excellent overall health as well as good practice about hair care. Healthy individuals have adequate nutritional intake through their daily diet. However, many people do not have access to good nutrition, and others have pathologies that lead to predisposition to nutritional deficiency. This is often reflected in changes in the scalp and hair fiber with frequent ruptures leading to alopecia [10].

The existing antioxidant list is large, however, only a few can be used in hair-use formulations. 21 In addition to their antioxidant activity, most have other biological properties. The growth factors and peptides used in treating alopecia, (anti-aging capillary) is scientifically proven. With advancing age, cells begin to produce fewer growth factors. The use of vitamin E, vitamin C, carotenoids, (poliquartenum 6, amisosoft EC22, betaine, starch 90, emulsified amino functional silicone, neolone, glycerin, high molecular weight dimethicone, butters, mineral oils, serisea II, hydrolyzed keratin in

the handling of Hair moisturizers with antioxidant action, we suggest that they are inert, nontoxic and above all should protect the hair against harmful solar action [7,11-15].

Growth factors are natural biological factors that act on the process of skin repair and regeneration, being found in various tissues undergoing healing and/or cell renewal [16-18]. They are considered protein molecules, produced by the body that binds to other cellular components to promote recovery, maintenance of skin integrity and regulation of tissues. However, with increasing age, there is a decrease in the number of these factors in the body. To produce a smaller amount of these factors impairing the communication between them and their functioning of the tissue, thus researches produced the growth factors homologous to human growth factors by genetic engineering, through the process of inoculation of human genes in bacteria. As the *Escherichia coli* [17-19].

The use of growth factors in topical or injectable cosmetics acts on cell recovery regeneration, healing improvement, rejuvenation treatment (wrinkles and fine lines), hair stimulation treatment (alopecia), as well as providing health for the patient. Fabric and aesthetic beauty for the skin [18]. In industry, it was possible to produce growth factors homologous to human growth factors, ensuring that these actives when supplemented *via*. exogenous, cellular activities are reactivated and the rejuvenation process becomes much faster [20-23]. In cosmetics, we have the following growth factors and their peptides available: Copper Peptide; EGF Nano factor (Epidermal Growth Factor); Nano factor IGF (Insulin Growth Factor); Nano factor VEGF (Vascular Growth Factor); Nano factor b-FGF (Basic Fibroblastic Growth Factor) [17-20]. Following are suggestions for formulations of the protocol performed on patients with alopecia below.

Hair loss interruption capsules

- Colágeno - 25 mg
- Exysnutiment - 100 mg
- Biotina - 30 mg
- Cisteína - 80 mg
- Cistina - 25 mg
- Clicocil - 25 mg
- Silicio quelado - 10 mg
- Magnésio quelado - 200 mg
- Boro quelado - 3 mg
- Pantotenato Cálcio - 25 mg
- Vitamina B6 - 10 mg
- Vitamina B2 - 1 mg
- Vitamina E - 3 mg
- Metionina - 200 mg
- Zinco quelado - 12 mg
- Selênio quelado - 100 mg

Suggested use: Take 1 capsule per day, 30 capsules.

Hair loss interruption lotion and new follicle stimulation

- Minoxidil - 5%

- Cooper Peptídeo de - 1.5%
- a FGF - 1.5%
- Hair Active - 10%
- Cafeína - 5%
- VEGF - 1.5%
- Folicusan - 3%
- Locao Hidroalcoólica 20% qsp to 100 ml

Patient use suggestion: Administer up to 20 drops on scalp and massage of stimulating hair drainage Injection suggestion [21].

Hair nutrition

- Minoxidil 0.5% to 2 ml Copper Peptídeo
- 10 mg to 2 ml Pill Food* 2 ml
- Lidocaína 2% to 2 ml

Patient use suggestion: Intradermal - 4 mm Needle 1 × Week

Androgenetic alopecia

- Biotina 10 mg to 2 ml, Minoxidil 0.5% to 2 ml
- D -Pantenol 40 mg to 2 ml, Finasterida 0.05% to 2 ml/ Lidocaína 1% to 2 ml

Patient use suggestion: Intradermal - 4 mm Needle - 1 × Week

Alopecia c/ Fatores de Crescimento

- Biotina 10 mg to 2 ml/ D-Pantenol 40 mg to 2 ml
- Minoxidil 0.5% to 2 ml/ IGF 1% + BFGF
- 1% + VEGF 1% + Copper Peptídeo 1% - 2 ml
- Lidocaína 1% - 2ml

Patient use suggestion: Intradermal - 4 mm Needle - 1 × Week

Alopecia Seborréica

- Biotina 10 mg to 2 ml/ D-Pantenol 40 mg to 2 ml
- IGF 1% + BFGF 1% + VEGF 1% + Copper
- Peptídeo 1% - 2 ml/ Lidocaína 1% - 2 ml/Beta
- Estradiol 2 mg to 2 ml

Patient use suggestion: Intradermal - 4 mm Needle - (Apply separately) 1 × week

According to Fitzpatrick et al. [24] growth factors and peptides today for the treatment of alopecia plays an important activity, especially Androgenetic alopecia, unlike conventional hair and hair growth treatments that are based on hair nutrition and vasodilation. Growth factors and their peptides stimulating formation of new hair follicles with abundant extracellular matrix deposition: essential for the growth and permanence of the new hair (fortified root).

Control with treatment follows some studies that prove the influence of growth factors and their peptides on the hair cycle. Due to hormonal issues as well as aging, responsible cells start producing a smaller amount of growth factors, directly influencing the amount of hair on the scalp. According to Fitzpatrick et al. [24], Japanese researchers at Kyoto University conducted a study, published in Tissue Engineering, which investigated how the prolonged-release Basic

Fibroblast Growth Factor (bFGF) affects rat hair growth in the anagen and telogen phases. Of the hair cycle after 10 days of application. Results show that 70 mcg of bFGF, after the given period, increased the size of hair follicles, proving its positive effects on the hair growth cycle in rats.

Copper Peptides (Copper Peptides) have been shown to act as a growth factor in cell differentiation, in addition to stimulating the proliferation of dermal fibroblasts and increasing the production of vascular endothelial growth factor. We evaluated the effect of Copper[®] Tripeptide (Copper[®] Peptide) complex on human hair growth through ex vivo study and dermal papilla[®] cell culture. The results showed that Copper Peptide stimulated the prolongation of live hair follicles and the proliferation of the dermal papillae of the follicle. Thus, it was concluded that Copper[®] Tripeptide Complex (Copper Peptide) promoted growth of hair follicles in humans, and that this effect may have occurred due to stimulation of proliferation and the prevention of hair loss.

One of the protocols carried out by Caregen in proving the efficacy of growth factors and their peptides in the treatment of alopecia is the use of a hair lotion containing Copper Peptide[®] associated with Insulin Growth Factor (IGF), Vascular Growth Factor (VEGF). And Basic Fibroblastic Growth Factor[®] (bFGF). Early in the treatment it is possible to notice the interruption of the fall thanks to the anti-5 alpha reductase action provided by the Copper Peptide [8,22,23]. After three months of use there was an increase in the hair population resulting from the actions of follicular revitalization, vasodilation and nutrition of the new hairs.

Final Considerations

The use of antioxidants and growth factors in the treatment of alopecia has been shown to be efficient, and the Injectables have thus expanded the therapeutic possibilities of aesthetic treatments. It was used in this study the various procedures and techniques such as: micro-needling, intradermotherapy, Led, Laser, the PDS method and the technique of treatment of induction of assets of Dr. Alex de Souza who makes use of the technique of the British Doctor Edward Jenner (1749 to 1823).

The actives manipulated the nutricosmetics for hair stimulation; each procedure was suggested to the patient a glass of soft red wine and a glass of drinkable H2O before and after the procedure. Same procedure. This approach will be studied in our next article, together with the study of ozone-enriched autohemotherapy in the treatment of alopecia.

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