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MEDICAL SCHOOL
AREA OF PATHOLOGY
SECONDARY CLINIC OF SKIN AND HERODESAL DISEASES
Director: Professor D. SOTIRIADIS

Building: G.N. ¨PAPAGEORGIOU¨

Evaluation study of the effectiveness of Evdermia Revolotion lotion by Evdermia in patients with hair loss using digital methods

Local formulation Evdermia Revolotion by company Evdermia

Period of study: 31/10/2013 until 2/10/2014

The study was carried out at the 2nd Skin and Venereal Disease Clinic, AUTH

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Study Summary

Introduction / Purpose: Hair loss is a common dermatological problem. Trichoscan is a method that combines microscopy with automatic digital image analysis to measure hair life cycle parameters. This is a study evaluating the effectiveness of Evdermia lotion formulation (Evdermia Revolotion) in patients with hair loss using digital methods.

Material and Method: The study concerns a total of 20 individuals (men-women) with hair loss. At first visualization with the Trichoscan method was used and then treated locally with the Evdermia Revolotion lotion. The lotion was applied once daily to the scalp for 8 months. Patients were monitored every 2 months and at the end of the 8 month period the hair cycle parameters were assessed using the Trichoscan method.

Results: After the end of topical treatment, patients showed a significant increase in both the median density of the total hairs and the median density of the final hairs.

Conclusions: The increase in the total hair density in combination with the increase in the percentage of finished hairs confirms and by measurable methods the good clinical result after 8 months of application of lotion Evdermia Revolotion.

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Study of 20 patients with hair loss using digital methods

2nd Clinic of Diseases of Skin and Venereal Diseases AUTH

Introduction

Computer analysis of digital images has been applied to study the life cycle of hair. Sensitive organs have been constructed with the aim of recording both hair growth and patients' response to treatment. It was quickly realized that recording the characterization and of hair features is a difficult task[1]. Physical features of the hair, phototype, sub- or hypochromatic lesions of the skin affect the final result of the recording. The physical characteristics correspond to the color of the hairs, their organization and orientation after exiting the hair follicle. In many cases more than one hair comes out of one pore making it difficult to measure. Trichoscan is a non-invasive digital method that combines microscopy with automatic digital image analysis [2.] It was originally used for the diagnosis and monitoring of androgenetic alopecia, but has recently been used in the treatment of hypertension [3]. This method requires the use of hair dye to improve the visualization and counting of thinner and colorless hairs [4]. Photographic equipment calibrated for photocurrent processing (CE-PTG) is used with sensitivity proportional to the biopsy of the hair for measuring the hair and monitoring its growth rate [5.] This method allows the measurement of parameters such as the density of hairs (n per cm2), the absolute number of hairs on a given surface (n per 0.728 cm2) and the ratio of flakes / ends (%). In our clinical trial using the Trichoscan method, we will evaluate the therapeutic effect of topical treatment with an original local lotion Evdermia Revolotion in twenty (20) patients with hair loss.

Materials and Methods

The study involved the follow-up of 20 patients, 6 males and 14 females with telogen hair loss and performed from 31/10/2013 to 2/10/2014. In 3 men coexisted with androgenetic alopecia. From the individual patient history none of them reported any chronic disease or systemic medication. Trichoscan was visualized before local treatment was initiated. The point of visualization was initially selected, which was present in all patients. The bristles were cut in the selected area to about 2 cm^2 and after 72 hours, the hair dye was applied in the area for 15-20 minutes. The dye was then removed with a special solution to remove it from the skin but not from the hair. Finally, Trichoscan was visualized in an area of 0.728 cm^2. The image was automatically digitally analyzed by recording parameters such as the absolute number of hairs on a given surface (n per 0.728 cm2), the density of all hairs in the area (n per cm2), the density of fluffy hairs (n per cm2), the density of final hair (n per cm2) and the ratio of fluffy hair / final hair (%) as shown in Figure 1.

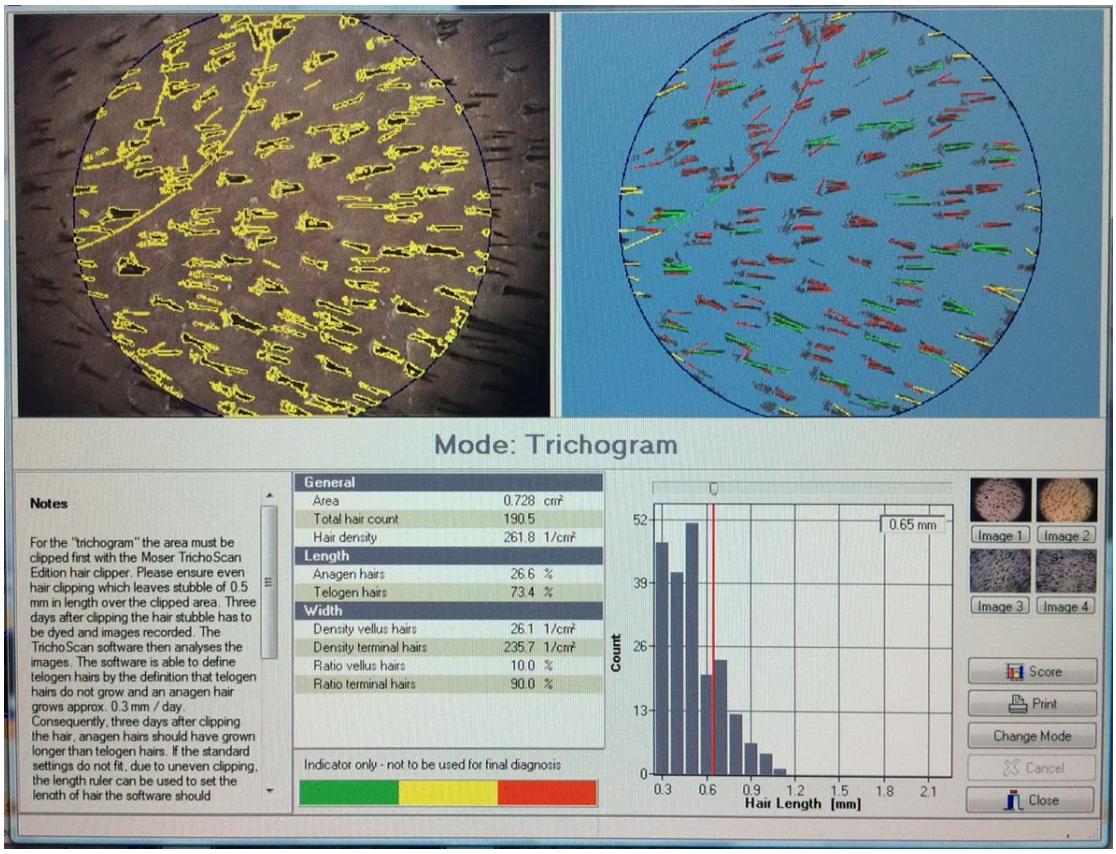

Figure 1

After the initial visualization was completed, topical treatment was started once daily with the ingredients containing Evdermia Revolotion lotion:

1. Azelaic acid
2. Hyaluronic acid
3. Matrixyl 3000(Palmitoyl tripeptide-1,Palmitoyl tetrapeptide-7)
4. Saw palmetto fruit extract(Serenoa serrulata)
5. Biotin
6. Aminodermin(methionine,cystein ,triptophan)
7. Nicotinamide(Niacinamide)
8. Panthenol

Patients were monitored every 2 months while continuing local application of the formulation, and at the end of the 8-month period, hair cycle parameters were re-evaluated using the Trichoscan method (Fig. 2) and changes in parameters were processed.

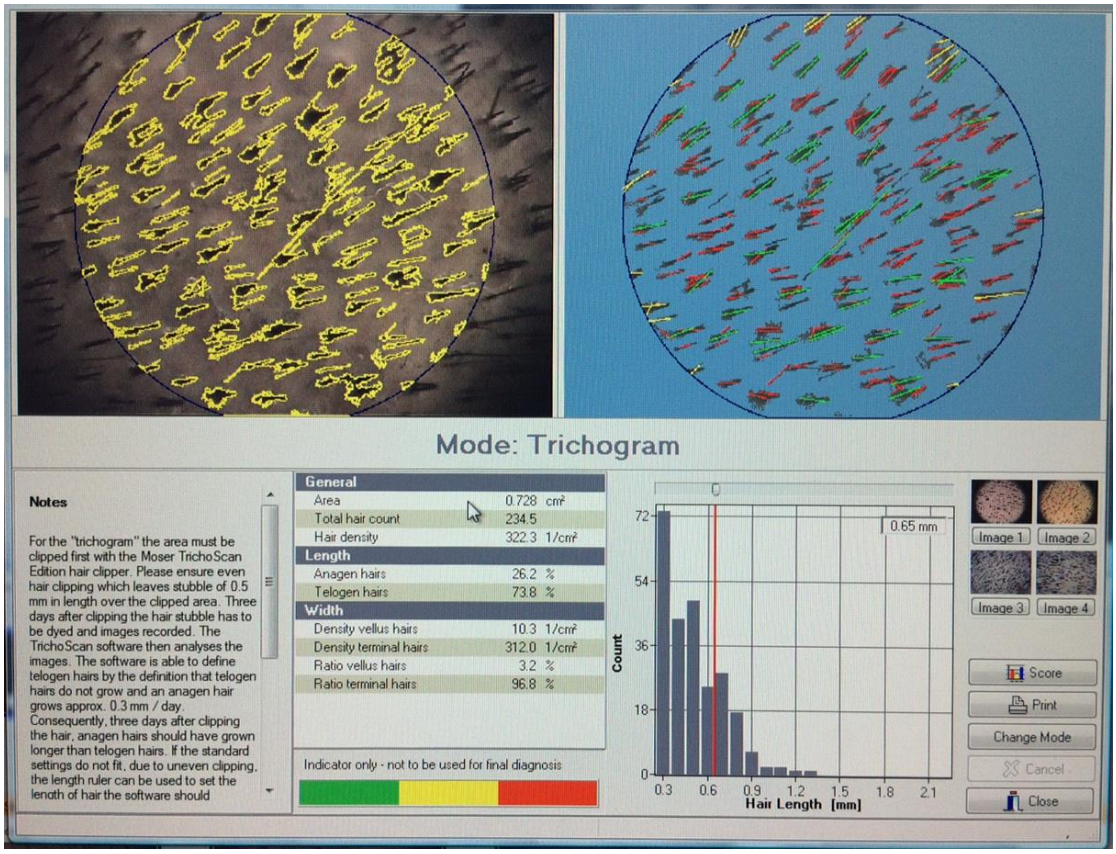

Figure 2

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Results

During the course of topical treatment no local or systemic adverse reactions to the formulation was reported from patients nor did any local irritation be found on clinical examination.
At the end of the clinical trial, the parameters recorded before and after treatment were compared.

Assessment of absolute number of hairs before and after treatment

The median value of the absolute number of hairs of patients (absolute number of hairs per 0.728 cm2) before treatment was 157.5 hairs / 0.728 cm2 while after 8 months of treatment the median value of the absolute number of hairs per patient (absolute number of hairs per 0.728 cm2) increased to 239.5 hairs / 0.728 cm2. In other terms, it increased by 52.06%.

	Before starting treatment	After starting treatment	p- value
Median number of hairs /0,728 cm2	157,5 /0,728 cm2	239,5 /0,728 cm2	0,001*

Of the total of patients, 17 patients were improvement in the density of hair growth, 2 patients worsened and 1 remained at the same level.

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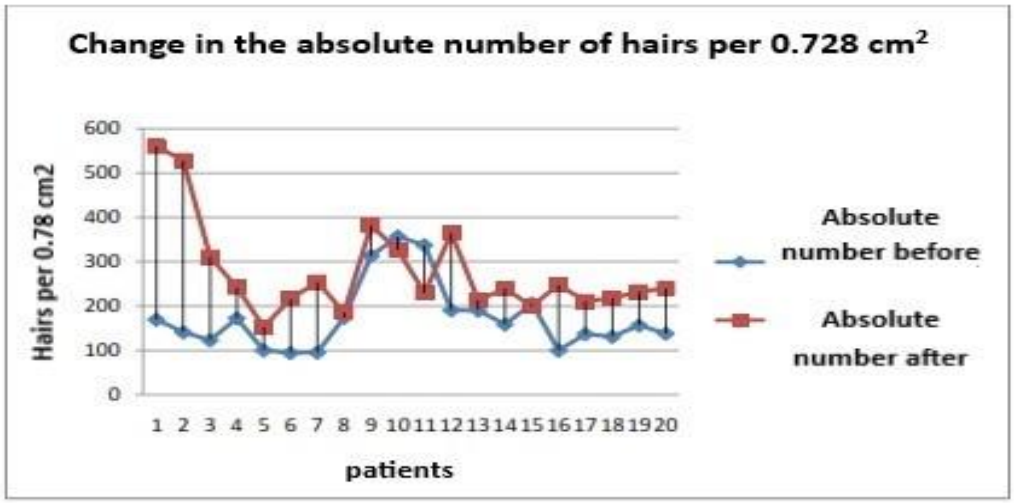

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Assessment of total hair density before and after treatment

	Before starting treatment	After starting treatment	p- value
Median value of hair density /cm^2	216,4 /cm^2	329,2/cm^2	0,001*

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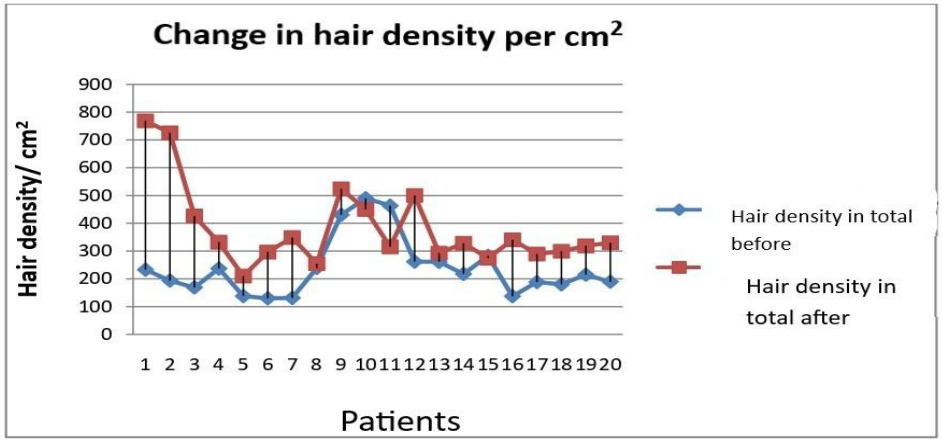

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Assessment of density of fluffy hair before and after treatment

The median density of patients hairs (per cm2) before treatment was 25.1 hairs / cm2 while after 8 months of treatment the median density decreased to 18.5 hairs / cm2, which was reduced by 26.3%.

	Before starting treatment	After starting treatment	p- value
Median value of density of fluffy hair /cm^2	25,1 /cm^2	18,55 /cm^2	0,313

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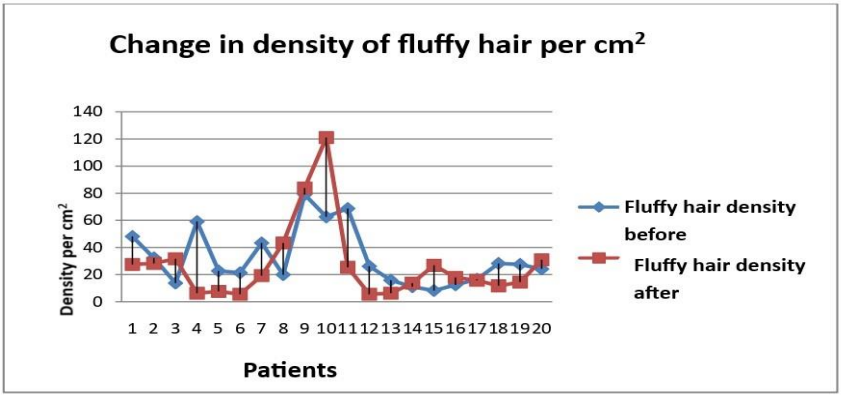

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Evaluation of percentage of fluffy hair

The median percentage of fluffy hair before treatment was 12.8% and after treatment decreased to 4.8% of total hair (final and fluffy).

	Before starting treatment	After starting treatment	p- value
Median percentage of fluffy hair (%)	12,8%	4,8%	0,015*

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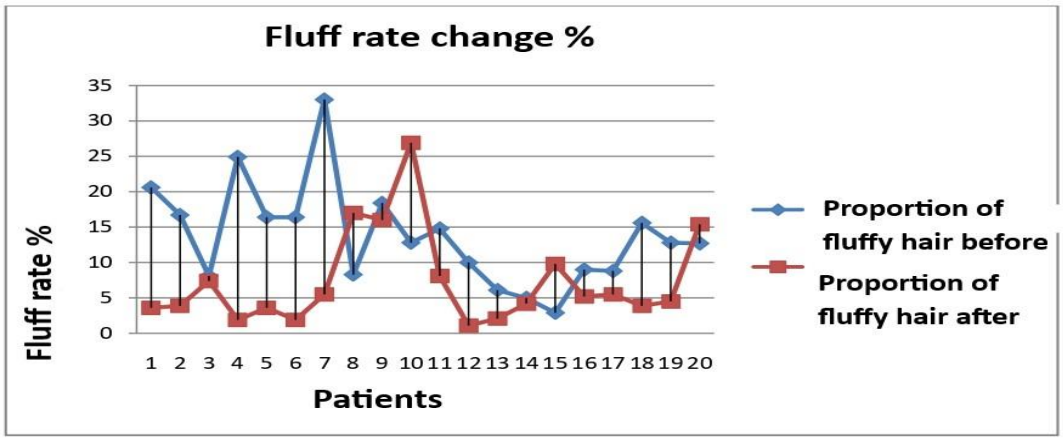

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Evaluation of final hair density before and after treatment

The median density of the final hairs of the patients (number of final hairs per cm2) before treatment was 181.45 hairs / cm2 while after 8 months of treatment the median density increased to 309.55 hairs / cm2, ie 70.6%.

	Before starting treatment	After starting treatment	p- value
Median value of final hair density /cm^2	181,45 /cm^2	309,55 /cm^2	0,001*

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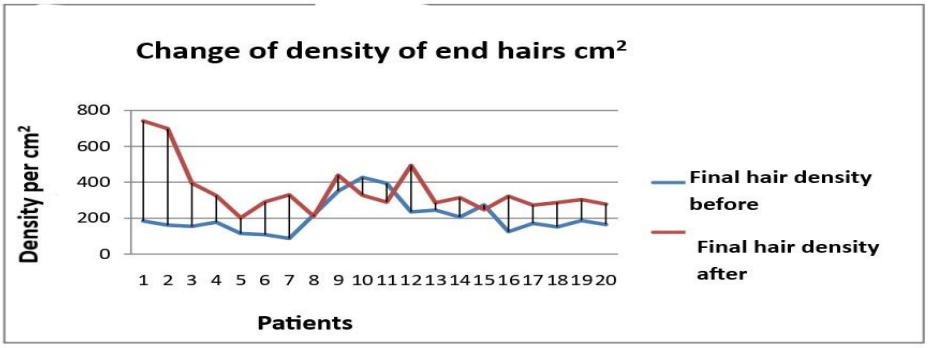

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Evaluation of percentage of final hairs

The median percentage of final hairs before treatment was 87.20% while after treatment it increased to 95.15% of total hairs (final and fluffy hair).

	Before starting treatment	After starting treatment	p- value
Median percentage value of finished hairs (%)	87,20%	95,15%	0,015*

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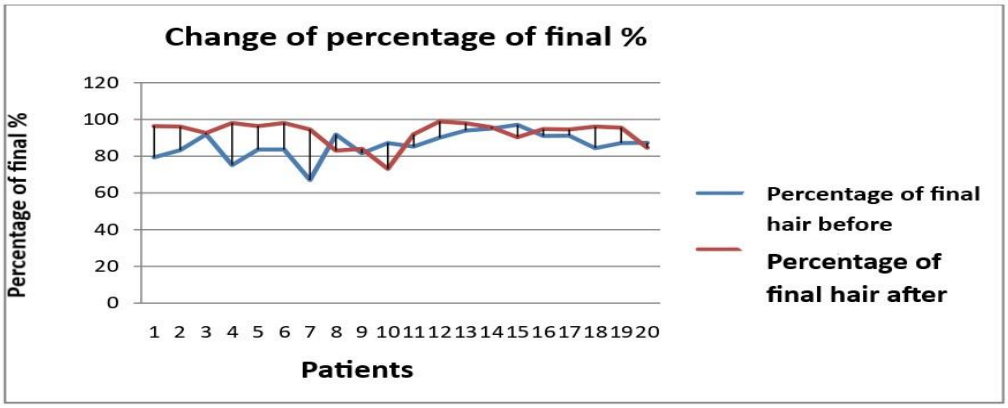

Discussion

After eight months of topical treatment with Evdermia Revolotion formulation from company Evdermia, patients showed a significant increase in both the median density of total hair by 52.12% and the median density of final hairs by 70.6%, whereas the initially median hairs thickness increasement decreased by 26.3%. In particular, while before treatment, the median percentage between final and fluffy hair was 87.20% to 12.8%, respectively, after treatment changed to 95.15% to 4.8%, thus showing a clear increase in the final hairs incidence. The combination of the increase in the total hair density with the increase in the percentage of end hairs confirms and by measurable methods the good clinical result. In addition, topical treatment with this formulation was well tolerated by all those who used.

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Bibliography

1. Van Neste D, Dumortier M, De Coster W. Phototrichogram analysis: technical aspects and problems in relation toautomated quantitative evaluation of hair growth by computer-assisted image analysis. In: Van Neste D, Lachapelle JM, Antoine JL, eds.
*Trends in Human HairGrowth an Alopecia Research.*Kluwer Academic Publishers, Lancaster, 1989: 155–165.

2. Hoffmann R. Trichoscan: combining epiluminescence microscopy with digital image analysis for the measurement of hair growth in vivo.
Eur J Dermatol 2001; **11** : 362–368.

3.Blume-Peytavi U , Hoffmann R ,Lavery S , Shariro J. Unwanted facial hair : affects , effects and solutions. Dermatology 2007: 215: 139-146

4. Rushton DH, De Brouwer B, De Coster W, Van Neste DJ. Comparative evaluation of scalp hair by phototrichogram and unit area trichogram analysis within the same subjects.
Acta Derm Venereol 1993; **73**: 150–153.

5. Van Neste DJJ. Contrast enhanced phototrichogram (CE-PTG): an improved non-invasive technique for measurement of scalp hair dynamics in androgenetic alopecia – validation study with histology after transverse sectioning of scalp biopsies. *Eur J Dermatol* 2001; **4** : 326–331.