Volume 7 Number 3 September 1996

# The Journal of Dermatological Treatment

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MARTIN DUNITZ PUBLISHERS

Journal of Dermatological Treatment (1996) 7, 159–162 

# Treatment of androgenetic alopecia with a 7.5% herbal preparation

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**A standardized 7.5% herbal extract preparation used to increase the density of hair growth was subjected to scientific investigation to evaulate its hair growth-promoting properties. A group of 24 healthy male subjects under the age of 55 years with stage III–IV androgenetic alopecia were enrolled in a randomized double-blind parallel-group vehicle-controlled study lasting 48 weeks. The hair inside a 1-cm tattooed triangle was harvested bimonthly. Measurements included total hair counts, non-vellus hair counts, average hair length and total hair weight. After 40 weeks of treatment, the mean total hair count increased by 77% in the active group compared to a 3% increase in the placebo group ($P=0.003$). The number of non-vellus hairs in a 0.433 cm$^2$ area increased by 169% for the active group compared to 33% for the placebo group ($P=0.01$). In the active group, 90% of the subjects showed an increase of more than 35% in non-vellus hair count compared with only 33% of the placebo group ($P<0.05$), and 60% of the active group had excellent results (>100% increase in non-vellus hair count) compared with only 8% of the placebo group ($P<0.05$). It was seen that the standardized herbal preparation was significantly more effective than the placebo.** (*J Dermatol Treat* (1996) **7:** 159–162).

**Keywords:** Androgenetic alopecia – Herbal treatment

*Received 16th November 1995; accepted 18th April 1996*

## Introduction

Androgenetic alopecia is the most common cause of hair loss.[1,2] Approved treatments include hair transplantation and the use of topical minoxidil. After a preliminary study[3] had demonstrated that a 7.5% standardized herbal preparation had the potential to stimulate hair growth, we performed this double-blind study to verify whether the preparation would promote hair growth.

## Materials and methods

### *Design*

Commonly used methods of evaluating hair growth[4–7] include counting the hair on the scalp in a marked area and various photographic techniques.[8] Both methods are prone to error owing to the difficulty in counting hair on the scalp and the possibility of photographing a bent hair shaft and counting it as two hairs. To avoid these problems we employed a more accurate method for evaluating hair growth, based on a protocol developed by Price and Menefee.[9] The hair growth evaluation included total hair count, terminal (non-vellus, melanized, mature) hair count, hair length, and total hair weight.

A randomized double-blind parallel-group vehicle-controlled study was done to compare an over-the-counter patented botanically derived herbal extract cream with the base cream of the herbal extract. The herbal extract was a 7.5% extract of fennel, polygonum, mentha, chamomile, thuja, and hibiscus in a water-based cream (Phydermanol Cream; Universal Biologics, San Rafael, CA; the extract is standardized using a spectrophotometer and HPLC). The preparation was applied to the scalp every 24 hours. The subjects were seen initially and dots tattooed on their scalp with sterile indian ink at each apex of an equilateral triangle of side 1 cm. The hair was then cut from this area. There was an 8-week period without application, after which the hair was harvested from the triangle, as a baseline. Application of active or placebo cream was made daily for 40 weeks and all subjects washed their hair daily with the same shampoo (manufactured by Universal Biologics). Every 8 weeks the hair was cut from the triangle, and counted, weighed and measured.

### *Patients*

Volunteers were males under 55 years of age with type III–IV androgenetic alopecia.[10] (Type III includes deep frontotemporal recessions and baldness of the vertex. In type IV, the frontal and frontotemporal recession is more severe than in type III, and there is a sparseness or absence of hair on the vertex area.) They had to be in good health by history, have no serious medical or psychological impairment and not be on any medication that could influence the study (steroids, anti-hypertensives, cytotoxic compounds, vasodilators, anticonvulsants, beta blockers, spironolactone, cimetidine, H2 blockers, cyclosporine, or antidepressants). The study was discussed with all volunteers and all signed informed consent agreements.

A total of 24 healthy male patients were selected. Using a randomization method the subjects were assigned to each group. The average age of the active group was 45.6 years compared with 40.5 years for the placebo group. One patient who was found to be slightly hypertensive in his initial entrance examination was dropped from the study when he was placed on therapy for his hypertension. A second patient relocated after 8 weeks.

### *Efficacy evaluation*

Subjects applied either active or placebo cream every 24 hours and washed daily with the same shampoo

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supplied to them. The subjects were seen monthly for observation and for any adverse reactions. Every 8 weeks the hair inside the triangle was cut with iris scissors and a cilia forceps. These hairs were counted, measured in length and weighed. Prior to cutting, the hair was washed with soap and acetone. All the hair samples were weighed on an analytical scale on the same day to avoid the effects of changes in temperature and humidity.

*Safety evaluation*

There were no complaints of irritation or other problems during the study.

*Statistics*

Non-vellus hair count at week 40 was the primary efficacy measure employed. An examination of group means, mean change and percentage change between baseline and final measurements was used to compare total hair count, terminal hair count, hair length and hair weight between the active and placebo groups. Variance analysis was performed using Wilcoxon's test, Fisher's exact test (nonparametric tests), and a *t*-test. A Pearson Product-Moment correlation between the percentage change in terminal (non-vellus, melanized, mature) hair counts and the percentage change in total hair counts was also calculated.

**Table I** Data for the active group

| | *Subject number* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
| Initial measurements | | | | | | | | | | |
| Total hair count | 51 | 84 | 29 | 7 | 86 | 63 | 5 | 47 | 75 | 23 |
| Terminal hair count | 32 | 34 | 18 | 2 | 33 | 42 | 4 | 28 | 48 | 8 |
| Hair length (8 weeks) (cm) | 1.3 | 1.6 | 1.28 | 0.29 | 1.72 | 1.72 | 1.6 | 1.12 | 1.91 | 1.51 |
| Hair weight (8 weeks) (g) | 0.001 | 0.0022 | 0.0011 | 0.00029 | 0.0016 | 0.00185 | | 0.0021 | 0.0032 | 0.00137 |
| Final measurements | | | | | | | | | | |
| Total hair count | 89 | 128 | 76 | 17 | 84 | 70 | 4 | 92 | 108 | 72 |
| Terminal hair count | 73 | 94 | 68 | 9 | 46 | 58 | 4 | 70 | 89 | 44 |
| Hair length (8 weeks) (cm) | 1.98 | 1.66 | 1.82 | 0.45 | 1.92 | 2.49 | 1.51 | 1.76 | 2.71 | 1.44 |
| Hair weight (8 weeks) (g) | 0.0016 | 0.00232 | 0.00258 | 0.0004 | 0.0018 | 0.0035 | | 0.00267 | 0.00489 | 0.0017 |
| Results | | | | | | | | | | |
| Total hair count change | 38 | 44 | 47 | 10 | –2 | 7 | –1 | 45 | 33 | 49 |
| Total hair count change (%) | 75 | 52 | 162 | 143 | –2 | 11 | –20 | 96 | 44 | 213 |
| Terminal hair count change | 41 | 60 | 50 | 7 | 13 | 16 | 0 | 42 | 41 | 36 |
| Terminal hair count change (%) | 128 | 176 | 278 | 350 | 39 | 38 | 0 | 150 | 85 | 450 |
| Hair length change (cm) | 0.68 | 0.06 | 0.54 | 0.16 | 0.2 | 0.77 | –0.09 | 0.64 | 0.8 | –0.07 |
| Hair length change (%) | 52 | 4 | 42 | 55 | 12 | 45 | –6 | 57 | 42 | –5 |
| Hair weight change (g) | 0.0006 | 0.00012 | 0.00148 | 0.00011 | 0.0002 | 0.00165 | 0 | 0.00057 | 0.00169 | 0.00033 |
| Hair weight change (%) | 60 | 5 | 135 | 38 | 13 | 89 | | 27 | 53 | 24 |

**Table II** Data for the placebo group

| | *Subject number* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* |
| Initial measurements | | | | | | | | | | | | |
| Total hair count | 40 | 44 | 104 | 34 | 42 | 43 | 88 | 45 | 62 | 67 | 59 | 98 |
| Terminal hair count | 30 | 21 | 46 | 22 | 14 | 27 | 48 | 18 | 46 | 40 | 17 | 62 |
| Hair length (8 weeks) (cm) | 1.5 | 1.32 | 1.61 | 1.11 | 1.61 | 1.34 | 1.7 | 0.87 | 1.75 | 1.74 | 1.52 | 1.8 |
| Hair weight (8 weeks) (g) | 0.001 | 0.0011 | 0.0019 | 0.0018 | 0.0013 | 0.0013 | 0.0024 | 0.0013 | 0.0025 | 0.003 | 0.0022 | 0.0042 |
| Final measurements | | | | | | | | | | | | |
| Total hair count | 36 | 56 | 112 | 33 | 66 | 24 | 118 | 39 | 64 | 61 | 56 | 92 |
| Terminal hair count | 30 | 38 | 54 | 24 | 34 | 18 | 86 | 18 | 57 | 36 | 29 | 78 |
| Hair length (8 weeks) (cm) | 1.39 | 1.94 | 2.35 | 1.64 | 1.79 | 0.97 | 1.71 | 1.47 | 2.17 | 1.61 | 2.22 | 1.99 |
| Hair weight (8 weeks) (g) | 0.0006 | 0.0024 | 0.0029 | 0.00142 | 0.0021 | 0.00098 | 0.00432 | 0.0014 | 0.0031 | 0.0025 | 0.0024 | 0.0036 |
| Results | | | | | | | | | | | | |
| Total hair count change | –4 | 12 | 8 | –1 | 24 | –19 | 30 | –6 | 2 | –6 | –3 | –6 |
| Total hair count change (%) | –10 | 27 | 8 | –3 | 57 | –44 | 34 | –13 | 3 | –9 | –5 | –6 |
| Terminal hair count change | 0 | 17 | 8 | 2 | 20 | –9 | 38 | 0 | 11 | –4 | 12 | 16 |
| Terminal hair count change (%) | 0 | 81 | 17 | 9 | 143 | –33 | 79 | 0 | 24 | –10 | 71 | 26 |
| Hair length change (cm) | –0.11 | 0.62 | 0.74 | 0.53 | 0.18 | –0.37 | 0.01 | 0.6 | 0.42 | –0.13 | 0.7 | 0.19 |
| Hair length change (%) | –7 | 47 | 46 | 48 | 11 | –28 | 1 | 69 | 24 | –7 | 46 | 11 |
| Hair weight change (g) | –0.0004 | 0.0013 | 0.001 | –0.0004 | 0.0009 | –0.0003 | 0.00192 | 0.0001 | 0.0006 | –0.0005 | 0.0002 | –0.0006 |
| Hair weight change (%) | –38 | 118 | 53 | –21 | 69 | –25 | 80 | 8 | 24 | –17 | 9 | –14 |

## Results

The initial and final measurements of the active and placebo groups are presented in Table I and Table II. Table III compares the average percentage change from baseline of the total hair count, terminal (non-vellus) hair count, total hair weight, and average hair length of ten hair samples taken from each subject. Mean total hair counts for subjects using the active cream increased by 77%, compared with a 3% increase for placebo-treated subjects ($P=0.003$; Figure 1). The average terminal hair increase was 169% for the active group and 33% for the placebo group ($P=0.01$; Figure 2).

Mean total hair weight increased by 49% for the active group and 20% for the placebo group ($P=0.12$). Mean hair length change for ten randomly selected hair samples was 29% for the active group and 21% for the placebo group ($P=0.32$). All the subjects in the active group had increased total hair weight, whereas 41% of the subjects in the placebo group had decreased total hair weight.

**Table III** Average percentage change between active and placebo groups

| | *Active group* | *Placebo group* | P-*value* |
|---|---|---|---|
| Total hair count | 77.4% | 3% | 0.003 |
| Terminal hair count | 169.4% | 33.9% | 0.010 |
| Total hair weight | 49.3% | 20.4% | 0.125 |
| Average hair length | 29.8% | 21.7% | 0.322 |

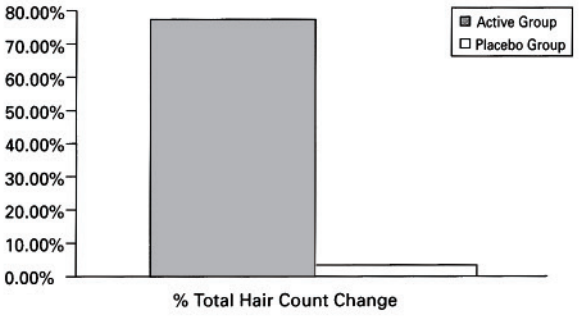


**Figure 1** Percentage change in total hair count. The average total hair count for actively treated subjects increased by 77% as compared to a 3% increase for the placebo-treated subjects.

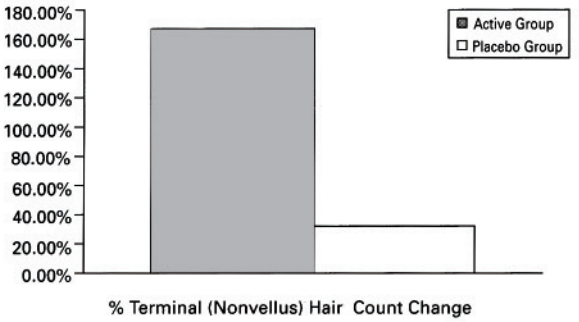


**Figure 2** Percentage change in terminal hair count. The average terminal hair (non-vellus, melanized, mature hair) count for actively treated subjects increased by 169%, as compared to a 33% increase for the placebo-treated subjects.

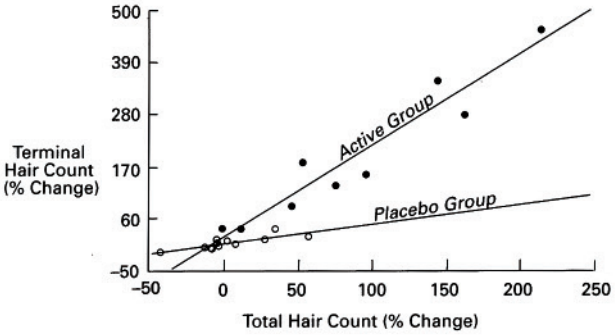


**Figure 3** Correlation between the percentage change in terminal (non-vellus, melanized, mature hair) hair counts and the percentage change in total hair counts in both the active (●) and the placebo (○) groups. The correlation coeffecient for the active group is 0.95, and for the entire group is 0.94.

After 40 weeks of treatment, 7 of 10 subjects in the active group had an increase in total hair count of more than 30% compared with 2 of 12 of subjects in the placebo group ($P<0.05$). In the active group, 9 of 10 subjects had an increase of more than 35% in non-vellus hair count compared with only 4 of 12 in the placebo group ($P<0.05$). In the active group, 6 of 10 subjects had excellent results (an increase in non-vellus hair counts of more than 100%) compared with only 1 of 12 subjects in the placebo group ($P<0.05$). As non-vellus hair count at week 40 was the primary efficacy measure, these results show that the active preparation provided a significant benefit in the treatment of androgenetic alopecia.

## Discussion

In preliminary studies, the active preparation had produced encouraging results as a hair growth agent. In one pilot study,[3] all 18 subjects showed increased hair counts, averaging 119%. A very high percentage (50–100%) of conversion from vellus to terminal hair and hair remelanization (50–100%) were observed.

We undertook the current study to verify the results observed in preliminary studies. The results of the study demonstrate that the active cream was significantly more effective than the placebo cream vehicle in the treatment of androgenetic alopecia. The herbal extract had 5-alpha reductase inhibition activity. However, the preparation demonstrated additional activity that requires further research. We have observed remelanization of the hair with the application of the preparation. This effect cannot be explained solely by 5-alpha reductase activity.

The most dramatic increases were seen in total hair counts and in terminal hair counts for the subjects who received the active treatment, compared with those who received the placebo. An interesting and excellent correlation was also found between the percentage increase in total hair count and the percentage increase in terminal hair count (Figure 3). The Pearson Product-Moment correlation coefficient was 0.95 for the active group and 0.94 for the entire study group (1.00 being a perfect correlation). Therefore, the terminal hair count may provide a primary quantitative estimate of hair growth. The strong correlation between the two different

measurement parameters of total count and terminal hair count warrants further study of the possible mechanisms underlying this relationship.[11,12]

Thus, a 7.5% standardized herbal extract preparation was shown to be effective in the treatment of androgenetic alopecia.

**Acknowledgements**
Universal Biologics provided support for this research.

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