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Enhancement of normal hair growth by topical treatment

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Synopsis
The effect on hair growth a hair lotion containing trichosaccarides[R] and vasodilators was assessed on 13 healthy volunteers in an open experiment. On side of the scalp was treated, the other was used as a control. In a first study the right side was treated; in a second one, 9 months later, the left side was treated. After 30 days of treatment, on the treated side a significant ($p < 0.001$) increase in the number of hair shafts per cm^2 of scalp area was found together with a higher hair lenght ($p < 0.001$).

Riassunto
Durante un esperimento aperto si è valutato su un campione di 13 volontari sani l'effetto di una lozione per capelli contenente tricosaccaridi e vasodilatatori sulla crescita dei capelli. È stato trattato un lato del cuoio capelluto, usando l'altro come riferimento. In un primo studio è stato trattato il lato destro, e in un secondo, 9 mesi dopo, il sinistro. Dopo 30 giorni di trattamento, sulla parte trattata si è riscontrato un aumento significativo ($p < 0.001$) del numero di capelli per cmq, nonché un allungamento ($p < 0.001$) dei capelli.

Résumé
L'effet d'une lotion qui contient des trichosaccharides et des vaso-dilatateurs, a été testé sur 13 volontaires sains. On a traité une partie seulement du cuir chevelu des sujets, à fin de pouvoir établir une comparaison entre les deux parties. Le test a été divisé en deux phases: la première fois on a soumis au test la partie gauche, après deux mois on a traité la partie droite du cuir chevelu. Aprés 30 jours de traitement, la partie traitée a révélé une augmentation importante du nombre ($p < 0,001$) et de la longeur ($p < 0,001$) des cheveux pour chaque cm^2 du cuir chevelu.

Synopse
Die Auswirkung eines aus Trichosaccaryd und gefässerweiternden Stoffen zusammengesetzen Haarwassers wurde im Lauf eines offenen Experiments auf 13 gesunde Menschen analysiert, die sich freiwillig solchen Experimenten unerziehen. Nur eine Seite der Kopfhaut wurde mit diesen Haarwasser behandelt, und die andere wurde als Kontrollmuster benutzt.
Zuerst wurde die rechte Seite und dann (nach 9 Monaten) die linke Seite behandelt. Nach 30 Tagen Behandlung konnte man einen bedeutenden Haarzuwachs ($p < 0{,}001$) und Haarlänge ($p < 0{,}001$) bemerken, was die behandelte Hauftläche anbelangte.

Resumen
Se ha valorado el efecto que una loción para el pelo con tricosácarides y vasodilatadores ha ejercitado sobre el crecimiento del pelo de 13 voluntarios sanos durante un experimento abierto. Se ha tratado un lado del cuero cabelludo y se ha utilizado como control el otro lado. Durante un primer estudio se ha tratado el lado derecho, y en un segundo, 9 meses después, se ha tratado el lado izquierdo. Después de 30 dias de tratamiento, sobre el lado que se había tratado se ha encontrado un incremento significativo ($p(0{,}001)$ del número de pelos por cmq junto a un alargamiento del pelo ($p < 0{,}001$).

Introduction

For decades hair lotions have been claimed to promote hair growth, but without any scientific evidence. The main reason for that was the lack of reliable methods to assess hair growth and hair density of the scalp. The trichogram technique (1, 2) based on the study of the bulbs of pulled hairs was an important advance and allowed interesting progress in the understanding of pathological hair conditions. But its use is limited, being this technique mostly qualitative. Furthermore, there are strong variations in «hair formula» depending on scalp areas and seasons (3). A more quantitative, though still uneasily practicable, method is the phototrichogram described by Saitoh (4) which allows the measurement of hair density and hair growth through a macrophotography.
Using the latter technique, we have measured the influence of a topical lotion on hair growth in normal people.

Material and methods

13 healthy volunteers, aged 16-30 years, without any sign of male pattern alopecia or scalp disease were selected for the experiment.
The tested lotion* was a mixture in an base of nicomethanol tartrate and ethyl nicotinate, both well-known vasodilators, and mucopoly saccharides extracted from mammalian gut (trichosaccarides^R+) (Table I). It was applied once every other day by gently spreading on the scalp without any rubbing, for at least one month. In a first study, the hair lotion was applied only on the right side of the scalp (late winter 1984). In a second study only the left side was treated (Autumn 1985). In each experiment, the untreated side served as a control. Each study involved 10 volunteers but 7 people participated in both studies. The statistical study was made using the analysis of variance and the paired t test comparisons, for each study separately, as an interaction was found between treatment and side effect.
Hair growth parameters were assessed as follows: two symmetrical areas, of about 4 cm^3, selected on each side of the scalp, were shaved and photographed four days later with a Polaroid CU5 close-up hand camera. After enlargement of the picture, hair shafts were counted on an area of 1 cm^2 using a network (see photograph). Hair length was measured before, during (at regular intervals), and at the end of treatment, using magnified photographs according to the Saitoh's method.

Results

1 - Hair density

On treated areas, the mean hair densities

Table I
Formula of the tested hair lotion

Trichosaccarides^R	50 mg
Nicomethanol tartrate	14 mg
Sodium pantothenate	7 mg
Ethyl nicotinate	5.6 mg
Biotin	0.175 mg
Hydroalcoholic base 7.1^c ad 7 ml	

(Table II and III) had increased by day 34 as compared to day 4, while on control areas, hair densities had clearly decreased in both studies. The analysis of variance on the whole data showed a significant difference due to the treatment ($F=18.5$ 1-18 df-$p<0.001$) but a weak interaction between side and treatment effect ($F=6.2$ 1-18 df-$p<0.05$). Consequently, a paired t. test was made on each study separately. Due to the large range of data obtained, the result of the first study was not statistically significant. The number of subjects displaying and increase in hair density by more than 2% on the treated side was 14/20 as compared to 3/20 on the control side ($p<0.01$, chi 2 test).

2 - Hair length after 30 day's growth

By the 30th day following shaving (Table IV), the mean length of hair was clearly (1st study) or barely (2nd study) higher in the treated side. Under paired t test comparison, the difference between treated and not treated sides highly significant ($p<0.001$).

In the first study (where the treatment had been maintained up to 68 days), a significant increase in hair length was found on the treated side on days 4 and 30, but not on day 64. In the second study, a greater hair length was found by days 20 and 30 but this was not statistically significant. There were only intraindividual differences, hair length being at a time significantly higher on treated si-

Table II
Number of hair shafts per cm² (mean and standard deviation) **in 10 normal subjects**

	1st study		2nd study	
	Day 4	Day 34	Day 4	Day 34
Treated side	255 ±54	266 (+4.3%) ±55	205 ±37	209 (+2.0%) ±39
Control side	235 ±36	226 (—3,8%) ±54	216 ±50	193 (—10.6%) ±36
Total difference	+8.1%		+12.6%	
Paired t test	(NS)		($p<0.001$)	

Table III
Number of hair shafts per cm². Difference between D 34 (end of treatment) **and D 4** (before treatment)

	1st study	2nd study
Treated side	10.5 ± 23.4	3.7 ± 15.8
Control side	—8.6 ± 38.0	—23.3 ± 20.9
Treated minus control side	19.1 ± 46.7 (NS)	27.0 ± 16.4 ($p<0.001$)

des in 6 subjects and on the control side in one subject (Table V).

Discussion

In the experiment acceptable variation coefficients were obtained both for mean hair density (15.3% to 23.9%) and hair growth (7.6% to 16.7%). As expected control sides demonstrated spontaneous trends with time. The reduction in hair density was statistically significant and occurred mostly during the second study, thus partly explaining the lower increase in hair shaft number as compared to the first study. Conversely, the rate of hair growth was significantly higher on both sides in the second study than in the first one.

Despite these physiological variations, statistically significant increases in hair density and hair growth ranging from 8.1% to 12.6% for hair density and from 2.3% to 20.1% for growth rate, were observed on treated sides. It is unlikely that a mechanical effect on hair growth has occurred as the lotion was applied only every other day and without rubbing. The used formula comprised known vasodilators which have long been used for promoting hair growth. Their effectiveness has never been quantitatively assessed, although they have been commonly used, sometimes successfully, in alopecia areata.

Other ingredients, such a mucoplysaccharides, may also have an effect as their increase in the dermis has been shown to be associated with hair growth (5, 6). Penetration studies should be performed together with further experiments to substantiate this point.

Nevertheless, the above experiment demonstrates that the Saitoh's method is sensitive enough to allow the identification of changes in hair growth parameters even in normal people and to assess the stimulating effect of a lotion applied every other day only.

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Table IV
Hair lenght (mm) on day 30 (mean and standard deviation)

	1st study	2nd study
Treated side	12.3 ± 1.5	13.5 ± 1.9
Control side	10.2 ± 1.7	13.2 ± 1.0
Treated minus control side	2.1 ± 1.1 (+20.1%) ($p < 0.001$)	0.3 ± 1.1 (+2.3%) (NS)

Table V
Statistical analysis of mean hair length difference (t test), between treated and control sides, at days 20 and 30 of treatment

Subject number	Day	t	p	treated (T) versus control (C) side
1	D20	1.42	NS	
	D30	1.39	NS	
2	D20	2.27	<0.05	T<C
	D30	1.04	NS	
3	D20	4.42	<0.001	T>C
	D30	0.03	NS	
4	D 20	3.14	<0.01	T>C
	D30	0.61	NS	
5	D20	7.45	<0.001	T>C
	D30	0.57	NS	
6	D20	0.81	NS	
	D30	0.54	NS	
7	D20	2.29	<0.05	T>C
	D30	0.59	NS	
8	D20	1.65	NS	
	D30	7.23	<0.001	T>C
9	D20	2.59	<0.05	T>C
	D30	0.24	NS	
D20	1.57	NS		
	D30	0.74	NS	

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Lead-time

We need a lot of this! There are many of you who have wonderful ideas for meetings. There are ideas for location, for theme, for time of year. There are ideas for subjects you would like to hear discussed and for subjects upon which you would like to speak.
Of course, some of the ideas will not be wonderful. Nevertheless, they are there — you do have them. What I would now like you to do is share them. Once I have the ideas, we can explore using them. There is a remote chance that they might fit into this year's plan. Possibly into next year's. Probably they can become the plan for a few years hence.
That is an explanation of «lead-time». In order to have your ideas utilized, I must have them well in advance. For us to place a meeting in a location of choice may require up to five years advance planning and reservations in peak seasons. A program with depth in a single area of interest requires twelve to eighteen months of preparation. And so on - and on.
The simple fact is, we want all of our programs to be excellent in site, topic, scope and presentation. We need your help in the form of ideas and comments. We need the help with a lot of «lead-time».
We have opportunities for regional and joint meetings around the world. We have possibilities for cooperation in on-going educational programs in Europe and in the Usa. In order to develope such potential benefits, we must know your wishes — how you can help — what you want to learn.
So, please send me your ideas. And let me have some lead-time.

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