

Reversal of Androgenic Alopecia by Minoxidil: Lack of Effect of Simultaneously Administered Intermediate Doses of Cyproterone Acetate

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Abstract. A male volunteer with frontal alopecia was treated simultaneously with 20 mg cyproterone acetate and 5 mg minoxidil topically (daily). During treatment with both drugs, new hair growth was observed on the alopecic scalp. The new hair was lost after discontinuing minoxidil treatment, although cyproterone acetate treatment was continued.

Key words: Androgenic alopecia; Cyproterone acetate; Minoxidil

Several drugs used for the treatment of refractory hypertension have been shown to have hypertrichosis as a side effect. This side effect is most prominent after administration of minoxidil (2,4-diamino-6-piperidino-pyrimidine-3-oxide), a substance that causes hypertrichosis in 90% of patients treated for less than 6 months and in 100% of patients treated for a year (Javier et al., 1980). Minoxidil has been reported to cause reversal of androgenic alopecia in some—but not all—individuals upon systemic administration (Zappacosta, 1980; Burton & Marshall, 1979). Even after topical application, hair regrowth is obtained, both in alopecia areata and in alopecia androgenetica (Weiss, West & Mueller, 1981; Headington & Novak, 1982).

Androgenic alopecia is a condition induced by androgenic hormones in genetically predisposed individuals (Hamilton, 1942). In the early phase, hair loss may be halted by antiandrogens, but hair regrowth occurs only incidentally (Stewart & Pochi, 1978; Zaun, 1971; Zaun & Ludwig, 1978). It was therefore of interest to investigate, both from a practical therapeutic aspect as well as from a theoretical point of view, whether the regrowth of hair caused by minoxidil could be maintained by treatment with cyproterone acetate.

CASE REPORT

A 30-year-old male volunteer with a marked frontal alopecia was treated with 20 mg of cyproterone acetate daily for one month. During this period the marked seborrhoea that was present before treatment disappeared completely and dandruff diminished markedly. The treatment was continued and simultaneously minoxidil was applied topically once daily according to Weiss, West & Mueller (1981). The total dose of minoxidil administered daily was 5 mg. One month after the beginning of minoxidil treatment, a few small, vellus type, but slightly pigmented hairs became visible in areas where isolated hairs were still present on the alopecic scalp. One month later these hairs had a maximum length of $\frac{1}{2}$ cm. At this time many vellus hairs in the same areas had increased in length; they remained unpigmented, however. Minoxidil treatment was then stopped but cyproterone acetate treatment was continued. The hairs continued to grow for one month, after which their length remained unchanged. By this time there was a marked reduction in body hair, indicating that the dose of cyproterone acetate used was effective. Four months after stopping minoxidil treatment, all the newly grown hairs fell out within a period of 2–3 weeks.

DISCUSSION

Cyproterone acetate has been shown to be effective in the treatment of androgenic alopecia in women (Abrahamson et al., 1981) and also in men treated with the drug for sexual aberrations (Winkel, 1971). It is remarkable that the treatment seems to be more effective with lower doses of the drug than with higher doses (Hammerstein, 1980). It has been suggested that the high progestational activity might be an explanation for this phenomenon. Whether or not this is true, androgenic alopecia appears to react at lower doses than does hirsutism. Since in our volunteer, body hair diminished markedly, the dose used should have been sufficient to produce effects on scalp hair. Our results therefore suggest that the hypertrichosis induced on the scalp by minoxidil cannot be maintained by cyproterone acetate.

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The Case of the Felted Wig

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Abstract. A sudden matting of hair after shampooing of a hairpiece is reported, which led the patient to a lawsuit. Chemical analyses showed that hairs were weathered and led to a possible explanation of the curious phenomenon.

Key words: Matting; Hairs; Shampoo

Matting of hair is known occasionally to follow the use of certain shampoos (1, 2, 3). However, felting

Table I

Amino acid	Root/ tip	Wig hair	Normal range
Cystine in %	Root Tip	14.1 14.6	approx. 16.8 (max) approx. 14.7 (min)
Cysteic acid in %	Root Tip	0.88 1.14	0.2-0.3 0.6-0.7
Cysteine (thiol) in %	Root Tip	0.32 0.37	0.20 0.35

of a hairpiece is quite unusual and the conditions in which such an event did in fact occur in our case, were not commonplace and may be of some interest.

CASE REPORT

A 55-year-old woman with a severe androgenic alopecia had a hairpiece surgically fixed to her scalp by means of Teflon-coated wire sutures. In the subsequent 10 months she had her wig shampooed periodically at the clinic where her "graft" had been performed. When for the first time she had her wig washed at a new clinic, she felt a sudden painful sensation on her scalp as though "the wig was being pulled off". So intense was the pain that the personnel had to remove the whole implantation. Legal action followed.

The patients showed us her wig, which looked like a rough mass of almost felted hairs, which was responsible for the distressing occurrence.

It was apparent that the hair had been treated in some way that caused it to felt. Accordingly, certain chemical and morphological investigations were planned.

MATERIALS AND METHODS

Since the bottle of the shampoo could have been confused with that of sodium thioglycollate, used for permanent waving, both the tip and the root portions of the hairs were studied as regards their thiol content (4).

To study the possible natural or artificial oxidizing degradation, the cystine and cysteic acid contents of the hydrolysed tip and root ends of hair were evaluated by means of an automatic amino-acid analyser (5).

Finally, hairs were embedded in glycerol and investigated by light microscopy.

RESULTS

The results of the chemical analyses are summarized in Table I.

Microscopically, a partial splitting off of the scales and other minor mechanical damage (Figs. 1-4) were observed in a great number of hairs.