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Androgenetic alopecia: some remarks on pathogenesis and management

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Introduction

Androgenetic alopecia (male pattern hair loss, AGA) is the commonest form of human alopecia, affecting about 50% of men by the age of 50years, and a smaller but still significant proportion of women by the same age. Traditionally, the management of AGA has been directed on the lines of

* Psychological support
* Use of cosmetics to thicken remaining hair/ make scalp less conspicuous
* Hair systems (wigs, toupees, weaves)
* Surgical procedures (punch graft, flap surgery)

More recently, as our understanding of the pathophysiological basis of AGA has evolved, drug therapy has become a realistic management option.

Pathogenesis of AGA

Androgens play a central role in the development of AGA. Strong evidence implicates dihydrotestosterone (DHT) as the active metabolite chiefly responsible for AGA. The enzyme responsible for the conversion of testosterone to DHT is 5-alpha reductase, and at least two isoenzymes exist, both of which have been cloned and their tissue distribution investigated [1]. The type 1 isoenzyme is the most abundant form in extracts of scalp tissue, and is predominantly located in sebaceous glands. The type 2 isoenzyme is localized mainly to the inner layer of the outer hair root sheath, and also the inner root sheath in some parts of the hair follicle. Although it is quantitatively outweighed by the type 1 5-alpha reductase, the type 2 isoenzyme is the form implicated in the aetiology of AGA [2,3].

Psychology of hair loss

Changes in the hair, especially its loss, can have profound effects on interpersonal reactions and on self-image [4]. Studies addressing the psychosocial impact of AGA in men have shown that men with visible hair loss are perceived as older, weaker and less physically attractive than their nonbalding counterparts [5].

As a consequence of the deep psychological effect that hair loss has on men, they are strongly motivated to seek medical advice in respect of their AGA. The treatment objectives can be summarized thus:

* prevention of further hair loss
* maintenance of existing hair
* regrowth and retention of lost hair

Large questionnaire surveys of balding men show that the majority are more concerned with prevention of further hair loss than with regrowth.

Drug treatments: minoxidil

The antihypertensive drug minoxidil was shown in the early 1980s to stimulate new hair growth, and was eventually approved as a topical treatment for AGA in men and women. Minoxidil is a vasodilator (by opening potassium channels) but it has no known antiandrogenic activity. The mechanism by which it exerts its positive effect on hair growth is not entirely clear, but appears to involve the following:

* conversion of vellus to terminal hairs
* normalizing the hair follicular morphology
* increasing the number of follicles in mid to late anagen (growth phase of hair cycle)

Multicentre clinical trials have demonstrated the efficacy of minoxidil in AGA. In most patients treated with topical minoxidil 2% for 12 months, mean hair counts increased [6]. However, topical minoxidil 2% has only limited success and the individual response is highly variable. Clinical trials with topical minoxidil 5% have shown promising results: in one study, 54% of treated patients showed an increase in hair counts, compared to 29% of patients on placebo [7].

Minoxidil has not shown any preventive activity, and its ability in the long term to retain new growth against a background of genetically associated hair loss has not been demonstrated.

Drug treatments: manipulation of androgen metabolism

Finasteride is a potent specific inhibitor of type 2 5-alpha reductase which is responsible for the conversion of testosterone to DHT.

In various double-blind, placebo-controlled, randomized studies in men with AGA [8,9], finasteride has been

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shown to produce a progressive increase in scalp hair counts at 6, 12 and 24 months.

The results are in line with our current understanding of the effect of DHT on hair physiology. It is apparent that, in the androgen-sensitive scalp of genetically susceptible individuals, DHT/androgens cause a gradual miniaturization of the follicles and conversion of long, thick pigmented terminal hair to short, fine, unpigmented vellus hair. Prevention of the androgen-mediated miniaturization will inhibit or retard the process leading to hair loss, and in some cases result in new hair growth.

Conclusions

The best therapeutic prospects lie in drug modalities that utilize our increased understanding of normal and pathological hair growth. Although topical minoxidil was the first effective drug to benefit a proportion of these patients, targeting of type 2 5-alpha-reductase in the scalp hair follicle is now a realistic option in the treatment of AGA.

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CORRECTION

We would like to correct the following:

In April 2003 page 40,the article "Calcipotriol and PUVA as a combination treatment in Vitiligo" was published in the name of Dr. Iqbal Bukhari and Dr. Nahid Mitkis.

The correction is that Dr. Nahid Mitkis is not a co-author and she wrote a letter to the secretary informing the withdrawal of her name as a co-author and this was not seen by the editor.

To confirm her withdrawal she sent a letter in her own handwriting that she is not a co-author of the above-mentioned article.

Conclusion:

"Calcipotriol and PUVA as a combination treatment in Vitiligo" – The only author is:

Dr. Iqbal Bukhari - *King Faisal University, College of Medicine and Medical Sciences Dermatology Department, Al-Khobar, Saudi Arabia.*