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The Difficult Hair Loss Patient

Guide to Successful
Management of Alopecia and
Related Conditions

 Springer

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Table 8.5 Hairstyling aids

Styling product	Formulation	Aim	Application
Hair spray	Aerosolized spray polymer (PVP, VA, MEA)	Maintain hair in desired position	Sprayed on finished hairstyle
Hairstyling gel, hair sculpturing gel	Clear gel polymer	Hold hair away from scalp for fullness or “spiky look”	Rubbed with hands on towel-dried hair
Hair wax	Soft opaque formable wax	Add increased hold to hair	Massaged into dry hair after softening in palm
Hair mousse	Aerosolized polymer foam	Hold hair away from scalp for fullness or “spiky look”	Squirted onto hand and dabbed through towel-dried hair
Ethnic styling aids			
Pomade	Ointment of petrolatum	Straighten, condition, moisturize, add shine to kinky hair	Combed with hands through hair
Brilliantine	Liquid oil	Allow ease of styling and proved shine	Massaged with hands through hair
Oil sheen spray	Aerosolized oil	For shine and moisturization	Sprayed onto hair
Curl activator	Clear glycerin gel	For ringlet hairstyles	Massaged with hands through hair

From: Draelos ZD (2005) Hair grooming cosmetics. In: Draelos ZD (ed) Hair Care. An Illustrated Dermatologic Handbook. Taylor & Francis, London /New York, p. 75

assessment of behavioral properties, it was found that CNPDA significantly increased the diameter of individual terminal scalp hair fibers by 2–5 μm , which yields an increase in the cross-sectional area of approximately 10 %. Beyond the increase in hair fiber diameter, the CNPDA-thickened fibers demonstrated enhanced mechanical properties characteristic of thicker fibers, such as increased suppleness/pliability and better ability to withstand force without breaking.

Ultimately, cosmetic products represent a key integral part of management of hair loss and thinning, since they may significantly improve the condition of the hair fiber with more immediate effects, while pharmacologic agents take their time.

finasteride means that further pathogenic pathways may be taken into account. Clinical and investigative advances have helped us to understand some of the pathogenic steps leading to androgenetic alopecia: besides androgens and genetic imbalance, additional pathogenic factors are suspected, such as microbial flora, endogenous and exogenous stress, microinflammation, and others. While further suspects are likely to be exposed, individual diversity of causal agents, as well as of the sequence of events, or combined factors, must be kept in mind, when addressing the biological conditions contributing to androgenetic alopecia. Ultimately, dissecting the molecular controls of immune-mediated hair follicle degeneration by apoptosis-mediated organ deletion could provide insights into how progression to permanent hair loss due to follicular inflammatory phenomena and fibrosis might be halted.

8.2.5 Targeting the Inflammatory Component in Androgenetic Alopecia

The limited success rate of treatment of androgenetic alopecia with topical minoxidil or oral

So far, the inflammatory component has not been included in treatment protocols for androgenetic alopecia.

In an early study, Piérard-Franchimont et al. hypothesized on a microbial-driven inflammatory reaction abutting on the hair follicles and conducted a study to compare the effect of 2 % ketoconazole shampoo to that of an unmedicated shampoo used in combination with or without 2 % minoxidil therapy. They found that hair density and size and proportion of anagen follicles were improved almost similarly by both ketoconazole and minoxidil regimens and concluded that there may be a significant action of ketoconazole upon the course of androgenetic alopecia and that *Malassezia* spp. may play a role in the inflammatory reaction. Later, Berger et al. performed a 6-month, randomized, investigator-blinded, parallel-group clinical study with healthy men between the ages of 18 and 49 years exhibiting Hamilton–Norwood type III vertex or type IV baldness to assess the hair growth benefits of a 1 % pyrithione zinc shampoo. The efficacy of a 1 % pyrithione zinc shampoo (used daily) was compared with that of 5 % minoxidil topical solution (applied twice daily), a placebo shampoo, and a combination of the 1 % pyrithione zinc shampoo and the 5 % minoxidil topical solution. Hair count results showed a significant net increase in total visible hair counts for the 1 % pyrithione zinc shampoo, the 5 % minoxidil topical solution, and the combination treatment groups relative to the placebo shampoo after 9 weeks of treatment. The relative increase in hair count for the 1 % pyrithione zinc shampoo was slightly less than half that for the minoxidil topical solution. However, no advantage was seen in using both the 5 % minoxidil topical solution and the 1 % pyrithione zinc shampoo.

Surprisingly, the use or addition of topical corticosteroids or of systemic anti-inflammatory agents such as oral hydroxychloroquine or oral doxycycline in the treatment plan of androgenetic alopecia (with microinflammation and fibrosis) has so far not been systematically studied. For now, we can only deduce a putative added benefit by analogy from their preliminary (successful) use in cicatricial pat-

tern hair loss or in central centrifugal cicatricial alopecia.

Proposed pathogenic mechanisms in androgenetic alopecia and respective therapeutic strategies are summarized in Fig. 8.7.

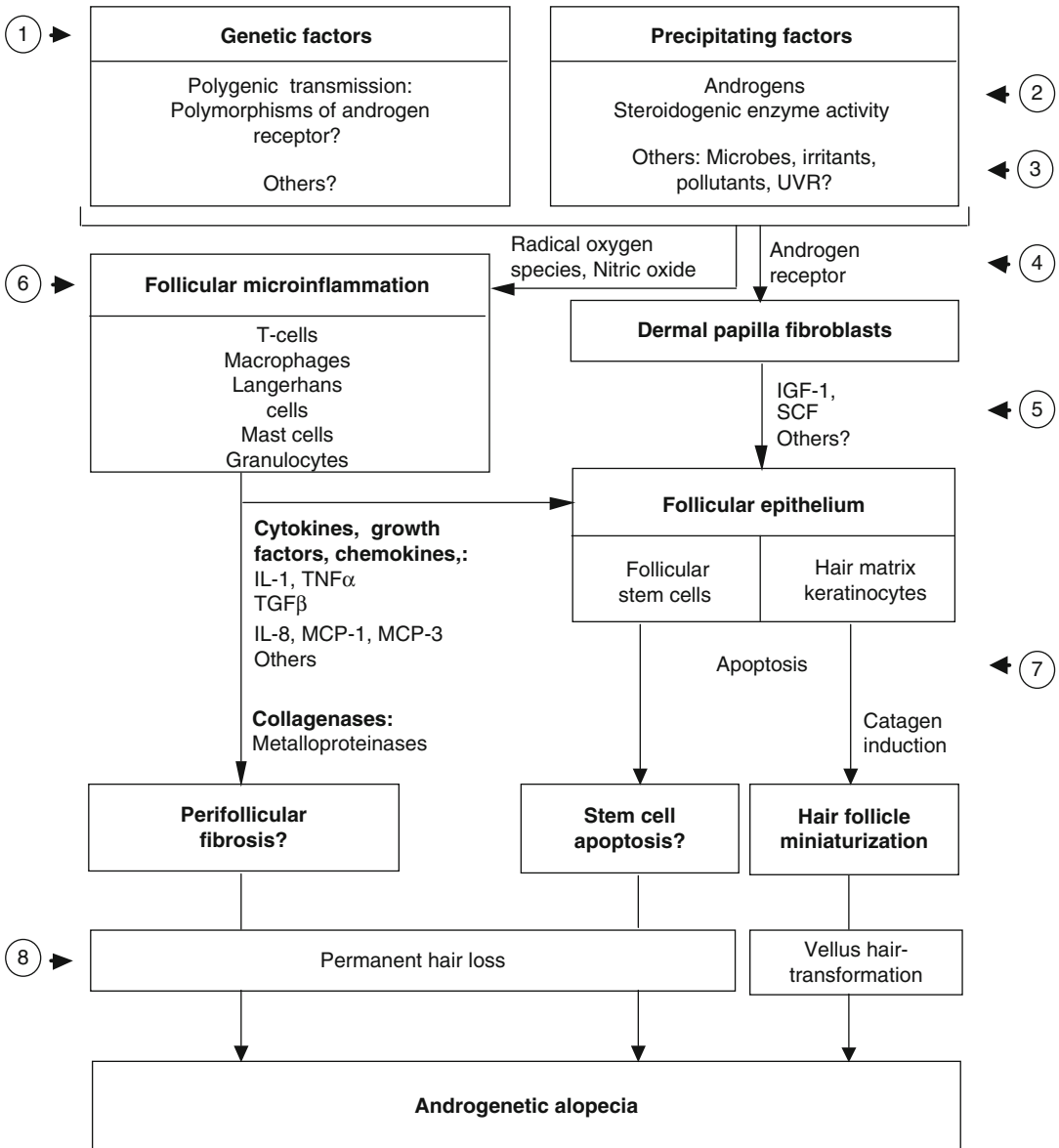
CG210[®] is a novel topical botanical hair growth-promoting agent based on *Allium cepa* (onion), *Citrus medica limonum* (lemon), *Theobroma cacao* (cocoa), and *Paullinia cupana* (guaraná) with a proposed three-level mechanism of action including (1) regulation of the intracellular anti-apoptotic Bcl-2 protein, (2) reduction of microinflammation, and (3) increase of collagen content and collagen remodeling. Safety and efficacy of the compound have been tested in more than 400 male and female volunteers with male and female androgenetic alopecia, respectively. Phototrichogram evaluations revealed the efficacy of the product in normalizing the proportion of hair in telogen, which is understood to be the consequence of premature follicular cell apoptosis in androgenetic alopecia.

8.3 Off-Label Use of Drugs

When a drug is used for unapproved indications, it is termed off-label use. Off-label use of drugs is legal, but the promotion of drugs toward unapproved indications is illegal.

The prescribing physician should be aware that the off-label prescription of drugs occurs at the discretion of the prescriber.

More than 2,000 different diseases are treated in dermatology, and for many there is no explicitly approved medication. Additional limitations in the approval status are related to patient age (children), pregnancy, and comorbidities. Therefore, for medical and ethical reasons in many treatment situations, prescription of medications off label is necessary. There are no standardized regulations on off-label use for dermatological indications.



Therapeutic strategies:

1. Gene therapy? (currently not available)
2. Modifiers of androgen metabolism: finasteride (available for men)
3. Antimicrobial shampoos?
4. Antiandrogens: cyproterone acetate (available for women)
5. Hair growth promoters: minoxidil (available for men and for women)
6. Antiinflammatory agents?
7. Apoptosis modulating agents? (currently not available)
8. Hair transplantation (available), implantation of dermal papilla cells or cells of follicle dermal-sheath (impending)

Fig. 8.7 Androgenetic alopecia: pathogenic mechanisms and therapeutic strategies (From Trüeb RM (2002). Molecular mechanisms of androgenetic alopecia. *Exp Gerontol* 37:981–990)