Understanding Male Skin Care Needs: The Challenge of an Evolving Market

Zoe Diana Draelos, MD
Dermatology Consulting Services, High Point, N.C. USA

KEY WORDS: *male skin, male hair loss, testosterone and skin*

ABSTRACT: *Male skin care needs are distinct due to the presence of testosterone. The unique attributes include increased skin thickness, enhanced sebum production and the onset of androgenetic alopecia. The market must evolve to address these needs.*

Not all skin is the same and this is one of the primary challenges to formulating a successful global cosmetic product. Perhaps the biggest difference is between the skin of men and women.[1] Male skin care products cannot be formulated to meet the same criteria as female products; they cannot be identical and simply housed in different packages.

The male skin care market is rapidly evolving to meet the unique needs of men, which is worthy of further consideration. The challenge of meeting male skin care market demands is that products must focus on three key attributes of male skin: increased skin thickness, the influence of testosterone and hair growth issues. These differences are obvious to the human eye but worthy of scientific discussion.

Increased Skin Thickness

Male skin is thicker than female skin, in part due to the presence of terminal hair follicles over much of the body. This difference is most pronounced on the face where women have only vellus hairs that are fine and colorless, while men have fully developed terminal hairs that are coarse and pigmented, taking up space within the skin. The presence of male facial hair is partially responsible for the more favorable appearance of mature men over mature women.[2] As UV radiation activates collagenase to destroy dermal collagen, the male beard allows the skin to resist wrinkling. Thus, photo-aged males do not exhibit the pronounced redundant facial skin seen in photo-aged females.

What does the thicker male skin mean for the skin care market? It means that photo-aging does not appear as early in men as it does in women. And while women are eager at a younger age to purchase skin care products, men are more resistant[3] because the rugged, coarse look is valued as a sign of masculinity and maturity.

> Photo-aged males do not exhibit the pronounced redundant facial skin seen in photo-aged females.

Thicker male skin is also less responsive to the beneficial effects of moisturization, especially on the hair-bearing upper cheeks. Moisturizing creams simply do not have early appeal to men due to their perceived lack of need and poor immediate efficacy.

The male beard also gives the skin a coarse texture, hiding surface cosmetic irregularities such as scarring, pigment inconsistencies and broken capillaries. If the beard-containing skin of the male face is stretched, many of these problems become apparent. Thus, women are more proactive in addressing problems than men, who do not see skin changes as easily or as early in life.[4]

Some of the inherent resistance to aging in male skin is due to its ability to diffuse UV radiation, especially in the UVA range. UVA radiation is the wavelength responsible for photodamage that penetrates more deeply into women's skin, thus speeding the photo-aging of women more rapidly than men. This phenomenon is magnified by the media's preference for younger leading women paired with older leading men.

This difference in skin thickness also affects the decreased frequency of adverse product reactions experienced by men. Women experience adverse reactions more commonly than men. The thinner skin may allow irritants and allergens to penetrate deeper in female skin; however, the increased incidence could also be due to greater product use.[5]

Women overall use more skin care products and cosmetics than men, which magnifies the chances of contacting an irritant or an allergen. Women are also more likely to undergo procedures that destroy the skin barrier such as facial peels, microdermabrasion and spa treatments. This may account for the appeal of products marketed to the "sensitive skin" of women, which likely does not resonate with the male consumer.

Influence of Testosterone

The changes previously discussed, such as increased skin thickness and facial hair growth, are in part due to the influence of testosterone—perhaps the most important consideration in the male skin care market. Testosterone secretion rises at puberty in males, with constant production throughout life. Testosterone causes the production of facial and body sebum, which sets the stage for the growth of *P. acnes* and the onset of acne.[6] For this reason, acne is typically more severe and longer-lasting in males than in females, with a predilection for the face, chest

and back.[7, 8] Since testosterone is present throughout life in men, sebum production also remains high.[9] This sebum production provides skin moisturization, making the need for face and body creams for men different than women. While men do indeed develop dry body skin at about the age of 60 and beyond due to reduced body sebum production, dry skin is an overall greater concern for women. Male skin's need for emolliency is perhaps greater than the need for moisturization during middle age, unless a skin disease is present. However, sebum production generally remains high on the male face, encouraging the development of creams that can modulate sebum where locally applied.[10] Many of these creams are anti-androgens and target testosterone receptors in the skin.[11]

Testosterone not only triggers the onset of abundant sebum production, but also increases the secretion of scented sweat, known as apocrine sweat, on the eyelids, breasts, scalp, buttocks and in the armpits. Both sebum and apocrine sweat create different skin cleansing needs.[12] Odor must be controlled but product formulators must also consider the interaction of sebum and sweat with skin care products. It is for this reason that fragrance should be carefully considered in male skin care products.

Men typically prefer deodorant soaps and antibacterial products since bacteria degrade the apocrine sweat rapidly, creating a characteristic musty scent.[13] This apocrine sweat, mixed with sebum rich in testosterone, creates a "locker room smell" that can ruin the most carefully balanced fragrance. These needs offer opportunities and challenges for scented products in the male skin care market.

Male body hair provides excellent sunscreen, better than anything packaged in a bottle.

Hair Growth Issues

While male body hair provides excellent sunscreen, better than anything packaged in a bottle, it also requires grooming. Shaving is the most common method used for body hair management, but some men have embraced laser hair removal. One of the problems with laser hair removal is that it changes the apparent skin color and texture. Loss of the hair in the follicular ostia eliminates brown tones, the most common color of male facial hair, leaving the skin appearing lighter. Loss of the hair also eliminates the coarse texture of the male facial skin and predisposes to wrinkling, as discussed earlier. It is unlikely that shaving will be abandoned by the entire male population for these reasons.

An alternative to frequent shaving has been the introduction of creams to irreversibly inhibit the enzyme ornithine decarboxylase, a key enzyme in the hair growth process. One currently marketed cream contains eflornithine.[14] While these creams have been primarily studied in women for the treatment of hirsutism, they may also have a role in male grooming, possibly accompanied by the use of laser hair removal.[15] Their success has been greater in women since the thinner facial skin allows for better eflornithine penetration and localized hair growth, either on the chin or upper lip, providing for targeted application. Yet, the addition of ornithine decarboxylase inhibitors to male aftershave products could possibly reduce the

5 o' clock shadow requiring many men to shave twice daily.

Shaving also produces some unexpected skin benefits. It is probably the most effective physical method of exfoliation, better than topical hydroxy acids, hand-held microdermabrasion devices or mechanical brushes. It efficiently removes desquamating corneocytes along with beard debris. Shaving also is an effective method of removing open comedones from the skin, providing acne treatment. However, improper shaving techniques result in razor burn, a form of folliculitis, and *Pseudofolliculitis barbae*. Razor burn results from the removal of the skin around where the hair exits, an opening known as the follicular ostia. Newer razors with spring-mounted blades and shaving gels that reduce friction can minimize the occurrence of razor burn.[16] *P. barbae* is often seen in individuals with kinky facial hair where the sharp edge of the cut hair re-enters the skin, causing inflammation in the form of a papule or pustule.

While males have abundant beard growth as a result of testosterone, it is this same hormone that is responsible for loss of scalp hair.[17] Hair follicles in the scalp are under hormonal control, possessing two receptors—type I and type II.[18] It appears that hair growth around the periphery of the male scalp is less subject to the effects of testosterone than the hair on the top of the head, accounting for the observed patterns of male baldness, a condition known as androgenetic alopecia. Modulation of these receptors with antiandrogens can minimize further scalp hair loss.[19] The first oral medication to minimize androgenetic alopecia was finasteride, a type II 5α-reductase inhibitor, which decreased both serum and scalp levels of dihydrotestosterone (DHT), the most active form of testosterone.[20, 21] A newer medication, dutasteride, which inhibits both type I and II 5α-reductase may be more effective.[22] Twin studies have demonstrated a reduction in hair loss after one year of administration.[23]

Other nonprescription sources are under investigation for their ability to increase male scalp hair growth. Botanical 5α-reductase inhibitors such as saw palmetto are being researched for their benefit in minimizing androgenetic alopecia. Saw palmetto has been touted for its ability to decrease prostate gland enlargement, a common male problem known as benign prostatic hypertrophy that results in difficulty urinating with age. The prostate gland appears to be under the same hormonal control as the scalp, as it is common to see both prostate problems and baldness in the same male population. The first nonprescription topical treatment for androgenetic alopecia, minoxidil, was originally developed as an oral medication for prostatic enlargement. It is a prostaglandin modulator that increases scalp hair growth both in men and women. This illustrates the interconnectivity of the human body allowing medications to have multiple organ effects simultaneously.

Summary

Male skin care is similar but different from female skin care. The presence of the facial beard provides photoprotection and resistance to facial wrinkling but hair removal can be challenging. Shaving can improve skin texture and minimize acne, yet poor shaving techniques can cause razor burn. The unique male biofilm, composed of apocrine sweat and sebum, requires careful hygiene and formulation considerations. This is, in large part, due to the presence of testosterone, which promotes facial hair growth and sebum production while causing loss of scalp hair. New treatments for these conditions have focused on hormone modulation, either through synthetic chemicals or botanical extracts. Successful products must consider the anatomy and physiology of the skin over which they are intended to function. This creates a market with unique challenges and opportunities for male skin care.

TECHNICAL LITERATURE ON THE EFFECTS OF ANDROGENS IN MALE SKIN AND HAIR

Following are some excerpts, selected by the editors from additional technical literature of the past two decades, showing some of the ways in which androgens are important in the care of male skin and hair.

- The rate and character of androgen-stimulated beard hair growth in an intact, sexually mature male is altered by the topical application of a dermatologically acceptable carrier of an antiandrogen material. In a preferred practice of the invention, compositions containing both a steroid 5-α-reductase inhibitor and a cytoplasmic androgen receptor-binding agent are employed.[24]
- The compound (2-hydroxy-2-methyl-N-(4-X-3-(trifluoromethyl)phenyl)-3-(2,2,2-perfluoroacylamino) propionamide) applied topically, specifically inhibits and/or eliminates cutaneous androgen receptors and thus finds cosmetic use in skin afflictions associated with excess androgens such as hair effluvium, hirsutism, acne and androgenic alopecia.[25]
- Allyl-phenol compounds [of a particular formula] are disclosed for the manufacture of a pharmaceutical/cosmetic composition for the treatment of androgenic disorders on skin, such as male-pattern alopecia, acne, seborrhea and dandruff.[26]
- Data suggests a catalytic effect of peroxisome proliferator-activated receptor (PPAR) ligands on cellular testosterone activation by 5α-reduction and the importance of the latter for the regulation of sebaceous lipids.[27]
- Double-stranded oligonucleotides may preferably be formulated with an acceptable pharmaceutical support in pharmaceutical or cosmetic formulations that are related to androgen metabolism or aimed at providing a beneficial effect on skin and/or hair.[28]
- Compounds of 2-hydroxy-2-phenyl/thiophenyl propionamides are modulators of the androgen receptor (AR) in a tissue selective manner. These compounds are useful in the enhancement of aging skin and a variety of male diseases and conditions.[19]

To get a copy of this article or others like it from a searchable database, visit the *C&T* magazine Article Archives at: *www.cosmeticsandtoiletries.com/articles.*

References

Send e-mail to zdraelos@northstate.net.

1. H Dao and RA Kazin, Gender differences in skin: A review of the literature, *Gend Med* 4(4) 308–28 (2007)
2. ZD Draelos, The shrinking world: Skin considerations in a global community, *J Cosmetic Dermatol* 5(1):1–2 (2006)
3. C Tan, Of senses and men's cosmetics: Sensory branding in men's cosmetics in Japan, *Euro J of Social Sciences* 6(1) 7–25 (2008)

4. LM Robertson, F Douglas, A Ludbrook, G Reid and ER van Teijlingen, What works with men? A systematic review of health promoting interventions targeting men, *BMC Health Serv Res* 8(1) 141 (2008)
5. ZD Draelos, Sensitive skin, *Amer J of Contact Dermatitis* 8(2) 67–78 (1997)
6. D Deplewski and RL Rosenfield, Role of hormones in pilosebaceous unit development, *Endocrin Rev* 21(4) 363–92 (2000)
7. SV Bershad, In the clinic: Acne, *Ann Intern Med* 149(1) 1–16 (2008)
8. JC Shaw, Acne: Effect of hormones on pathogenesis and management, *Am J Clin Dermatol* 3(8) 571–8 (2002)
9. MG Mercurio and DS Gogstetter, Androgen physiology and the cutaneous pilosebaceous unit, *Gend Specif Med* 3(4) 59–64 (2000)
10. H Dobrev, Clinical and instrumental study of the efficacy of a new sebum control cream, *J Cosmet Dermatol* 6(2) 113–8 (2007)
11. CC Zouboulis and K Degitz, Androgen action on human skin, *Exp Dermato* 13(suppl 4) 5–10 (2004)
12. CC Zouboulis, WD Chen, MJ Thornton, K Qin and R Rosenfield, Sexual hormones in human skin, *Horm Metab Res* 39(2) 85–95 (2007)
13. K Wilke, A Martin, L Terstegen and SS Biel, A short history of sweat gland biology, *Int J Cosmet Sci* 29(3) 169–79 (2007)
14. JA Balfour and K McClellan, Topical eflornithine, *Am J Clin Dermatol* 2(3) 197–201 (2001)
15. I Hamzavi, E Tan, J Shapiro and H Lui, A randomized bilateral vehicle-controlled study of eflornithine cream combined with laser treatment versus laser treatment alone for facial hirsutism in women, *J Am Acad Dermatol* 57(1) 54–9 (2007)
16. The Gillette Co., Safety Razor Blade Unit WO 2002/032632, Patent application number PCT/US2001/031600, Int. class B26B 21/22 (Apr 25, 2002)
17. MJ Thronton, I Laing, K Hamada, AG Messenger and VA Randall, Differences in testosterone metabolism by beard and scalp hair follicle dermal papilla cells, *Clin Endocrinol* 39(6) 633–9 (1993)
18. S Lui and H Yamauchi, Different patterns of 5α-reductase expression, cellular distribution and testosterone metabolism in human follicular dermal papilla cells, *Biochem Biophys Res cumun* 368(4) 858–64 (2008)
19. Merck & Co., Inc., Phenyl/thiophenylpropionamides as androgen receptor modulators, Patent application number PCG/US2007/021984, Int. class A61K 31/4436 (Apr 24, 2008)
20. J Leyden et al, Finasteride in the treatment of men with frontal male pattern hair loss, *J Am Acad Dermatol* 40(6) 930–7 (1999)
21. VH Price, E Memefee, M Sanchez, P Ruane and KD Kaufman, Changes in hair weight and hair count in men with androgenetic alopecia after treatment with finasteride, 1 mg, daily, *J Am Acad Dermatol* 46(4) 517–23 (2002)
22. EA Olsen et al, The importance of dual 5 α-reducatse inhibition in the treatment of male pattern hair loss: Results of a randomized placebo-controlled study of dutasteride versus finasteride, *J Am Acad Dermatol* 55(6) 1014–23 (2006)
23. D Sough, Dutasteride improves male pattern hair loss in a randomized study in identical twins, *J Cosmet Dermatol* 6(1) 9–13 (2007)
24. WO/1985/002543, Hair growth modification, EG Kaszynski et al (Jun 20, 1985)
25. WO/2001/058854, A topical antiandrogen for hair loss and other hyperandrogenic conditions, M Sovak et al, assigned to Biophysica Inc. (Aug 16, 2001)
26. WO/2003/082233, Allyl-phenol compounds in androgenic disorders, C Ghisalberti (Oct 9, 2003)
27. E Makrantonaki and CC Zouboulis, Testosterone metabolism to 5-α-dihydrotestosterone and synthesis of sebaceous lipids is regulated by the peroxisome proliferator-activated receptor ligand linoleic acid in human sebocytes, *Brit J Dermatol* 156(3) 428-432 (2007)
28. WO/2008/035291, A double stranded RNA oligonucleotide: A pharmaceutical or cosmetic composition containing it and its use as an active pharmaceutical ingredient in the treatment of androgen-related diseases, N Kerner et al, assigned to Pablo Cassara do Brasil, Comercio de Medicamentos LTDA (Mar 27, 2008) C&T