Maturitas xxx (2012) xxx–xxx

Contents lists available at SciVerse ScienceDirect

Maturitas

journal homepage: www.elsevier.com/locate/maturitas

Review

Managing hair loss in midlife women

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ARTICLE INFO

Article history:
Received 26 October 2012
Accepted 28 October 2012
Available online xxx

Keywords:
Alopecia
Hair loss
Women
Female pattern hair loss
Telogen effluvium
Hair shaft

ABSTRACT

Hair is considered one of the most defining aspects of human appearance. Hair loss, or alopecia in women is often met with significant emotional distress and anxiety. In midlife, women may encounter various hormonal and age-related physiologic changes that can lead to alterations in hair texture and growth. The most significant hormonal alteration is the onset of menopause in which there is a cessation of ovarian estrogen production. This decrease in estrogen is known to have deleterious effects on the skin and cutaneous appendages. As our understanding of the molecular and hormonal controls on the hair follicle has grown, there has been increased interest in the various modulators of hair growth, including the potential role of estrogen. Further study of hair changes in midlife women provides an important opportunity for identification of the complex regulation of hair growth as well as identification of treatment targets that may specifically benefit women. In this review, management of hair loss in midlife women is discussed with a focus on three most commonly encountered clinical conditions: female pattern hair loss, hair shaft alterations due to hair care, and telogen effluvium.

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Contents

1. Introduction

Hair is considered one of the most defining aspects of human appearance. Throughout history, hair length, style, and color have been used to make statements about virility, sexuality, religion, military status and more. Alopecia, or hair loss, is a common and distressing problem and is often met with feelings of grief, and a lost sense of "self"; this is especially true in midlife women [1,2]. In one large hair referral clinic, it was reported that the majority of consultations for hair loss in women occurred between the ages of 30 and 59 [3]. Other studies have reported increasing incidence of hair loss with advancing age [4–6]. Women with alopecia must not only face the loss of their hair, but they often feel isolated, embarrassed to seek care, and may be frustrated by mis-information, misdiagnosis, or poor treatment options.

During our lifetime, each hair follicle undergoes continuous cycles of growth (anagen), resorption (catagen) and rest (telogen). The portion of hair that is seen is called the hair shaft or hair fiber. That portion which is below the surface of skin and is responsible for the production of the hair shaft, is the hair follicle. Hair changes can occur due to alterations of the hair shaft, the hair cycle, or the follicle. In this review, management of hair loss in midlife women is

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0378-5122/$ – see front matter © 2012 Elsevier Ireland Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.maturitas.2012.10.020

Please cite this article in press as: Mirmirani P. Managing hair loss in midlife women. Maturitas (2012), http://dx.doi.org/10.1016/j.maturitas.2012.10.020

discussed with a focus on three most commonly encountered clinical conditions: female pattern hair loss (FPHL), hair shaft alterations due to hair care, and telogen effluvium due to hair cycle changes. Current areas of hair research that are specifically of interest in this group are also highlighted. The goal of the review is to enable clinicians to identify common hair problems in midlife women and to initiate proper evaluation, treatment and counseling.

2. Clinical evaluation

All too frequently, the chief complaint of a patient is "hair loss." The practitioner needs to clarify and qualify the complaint in order to narrow the differential diagnosis. Specific questions that can be helpful include:

1. "*When did the hair loss start*?" "*Was the hair loss sudden in onset, or gradual*?" A sudden onset of hair shedding, often indicates a disruption of the hair cycle (telogen effluvium) whereas gradual hair thinning typically occurs in FPHL.
2. "*Where have you noticed the most hair loss*?" Determining whether the hair loss is patchy, diffuse, or patterned can help narrow the differential diagnosis. Diffuse shedding typically occurs due to hair cycle changes (telogen effluvium). Patterned thinning involving mainly the top or sides of the scalp is often indicative of a diagnosis of FPHL.
3. "*What is your normal hair care routine*?" Hair care practices and use of hair cosmetics (e.g. coloring, permanent waving, and use of heat) can alter the texture, appearance, manageability and strength of the hair.

A thorough examination of the hair includes an assessment of the patient's global appearance: Would you identify this patient from afar as someone with alopecia? What is the texture, color, and length of the hair? These features often modify or alter the appearance of hair thinning and should be documented as part of the exam. Hair distribution over the rest of the body is assessed to see if there is too little or too much hair in other areas. Acne or other signs of virilization are also noted.

After establishing a global picture of hair loss, a more detailed examination is undertaken to evaluate the health of the hair shaft, the pattern and distribution of hair loss, and the presence or absence of excessive hair shedding (pull test). Choice of laboratory tests should be directed by the history and exam. A basic evaluation including thyroid stimulating hormone, ferritin and vitamin D is often undertaken in all patients [7,8]. In women with virilizing signs such as acne, hirsutism, and/or irregular menses, a basic endocrine panel consisting of free testosterone, prolactin, dehydroepiandrosterone sulfate (DHEAS) to rule out hyperandrogen states may be considered [9]. The differential diagnoses for hair loss in women can be grouped into 3 categories: disorders affecting the hair follicle (FPHL), the hair shaft, or disturbances of the hair cycle (telogen effluvium). The following is not meant to be an exhaustive review of possible causes of hair disorders, but instead a highlight of common hair changes in midlife women.

3. Female pattern hair loss

Female pattern hair loss may be considered the equivalent of male pattern baldness or hereditary thinning, also known as androgenetic alopecia, but there are some key differences that are important to note. In both men and women, thinning typically begins in the teens, twenties and thirties [10]. Pathophysiologically there is a substantial increase in the local transformation of testosterone to dihydrotestosterone (DHT) by the enzyme 5α-reductase at the folliculo-sebaceous unit [11]. DHT, which has a five times higher affinity for the androgen receptor compared to testosterone triggers specific genes responsible for the gradual miniaturization of genetically programmed hair follicles [12]. It has been suggested that the various clinical patterns of androgenetic alopecia in men and women may reflect quantitative differences in levels of androgen receptor and the steroid-converting enzyme, aromatase in specific scalp regions at different ages [13]. However, there is increased recognition that there may be other non-androgen causes of hair thinning in women that have no counterpart in men. Thus, the term female pattern hair loss has been favored to encompass the clinical phenotype of hair loss in the central and temporal scalp region that may occur in genetically predisposed women due to androgens as well as hormonal changes due to menopause [14,15].

Although the etiology of FPHL has not been fully elucidated, it is suspected that the near cessation of ovarian estrogen production during menopause contributes to alterations in hair growth characteristics. Estrogen has complex interactions with other hormones, growth factors, transcription factors, and cytokines that can modify its biologic activity [16]. Additionally, the relative distribution and location of the two known estrogen receptors, and the peripheral converting enzyme, aromatase, also alter the effect of estrogen [16–18]. Indeed, selective estrogen receptor modulators and aromatase inhibitors may potentiate the clinical manifestations of FPHL [19,20]. Thus, while it has been recognized that estrogen is an important modulator of hair growth, the details of the molecular regulatory pathways have not been well characterized.

Similar to other estrogenic target tissues, the biologic activity of the hair follicle is altered pre and post-menopause. In women without overt hair loss there are significant differences in hair growth characteristics between pre- and post-menopausal women, specifically hair growth rate, density, percent anagen, hair diameters and hair diameter distributions [21]. Various reports have suggested decreased hair density and diameter occurs with advancing age in both sexes [6,22–25]. Studies in Japanese women show a peak in hair diameter occurs somewhere around the age of 40 [25,26]. In a comprehensive study of Caucasian women hair diameter increased from approximately 20 to 40–45 years of age then decreased whereas hair density was highest in the earliest age group included, 20–30 years of age [21]. The maximal hair diameter decreases occurred during the peri-menopause period, or transition to menopause phase [21].

The compounded effect of miniaturized hair follicles, decreased hair density and diameter results in a finer and shorter hair shaft. Women with FPHL usually first notice a gradual thinning of their hair, mostly on the top of their heads, and their scalp becomes more visible. Over time, the hair on the sides may also become thinner. The patient may notice that her "ponytail" is much smaller or that her longer hair looks "skimpy" at the ends. The thinning of the hair can vary in extent but it is extremely rare for a woman to become bare on top. Examination of the scalp will show a patterned hair loss with the frontal hairline intact but a widened central part compared to the occipital part. There is no loss of follicles, but instead increased spacing between the hairs. Miniaturized hairs are characteristic. Extensive laboratory tests are usually not needed if the woman has no clinical evidence of androgen excess.

Treatment for women with FPHL includes: medical, surgical and cosmetic options. In the medical category, 2% topical minoxidil solution used regularly can partially re-enlarged the miniaturized hairs and prolong the anagen phase [27,28]. In women, the use of 5% topical minoxidil solution applied twice daily has been proven to be more efficacious than 2% minoxidil; however, there is a higher incidence of side effects with the stronger preparation such as scalp pruritus, local irritation, and unwanted hypertrichosis [29]. In a recent study the use of 5% topical minoxidil foam once daily was shown to be as effective at 2% topical minoxidil solution applied twice daily [30]. The benefits of the once daily foam include less

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