



ALOPECIA: AN EXTENSIVE NARRATIVE REVIEW OF TYPES, CAUSES, AND MANAGEMENT STRATEGIES

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ABSTRACT

Hair biology is a complex process involving the interaction of hair follicles, dermal papilla, and hair shaft components. Hair loss disorders encompass various conditions, such as cicatricial (scarring) and nonscarring alopecia, along with structural hair disorders. A thorough patient interview, physical examination, and trichoscopy aid in diagnosing hair loss forms. Management involves addressing underlying causes, and initial treatments include topical minoxidil and oral finasteride/dutasteride for androgenetic alopecia. Corticosteroids and platelet-rich plasma may be used for inflammatory alopecia. Treatment outcomes may vary, necessitating a tailored approach for each patient. Ongoing research and clinical trials offer promise for more targeted and effective therapies in the future. Patients should collaborate with healthcare providers to determine suitable treatment strategies.

KEYWORDS : Alopecia, Androgenetic Alopecia, Alopecia Areata, Cicatricial Alopecia, Telogen Effluvium.

INTRODUCTION

Throughout this review, we will discuss various types of hair disorders and their distinct characteristics in detail, focusing on the latest advancements in the field of dermatology and trichology. By analyzing these disorders separately, we aim to offer a more nuanced perspective on the diverse array of conditions contributing to hair loss. With an eye towards improving clinical management and patient outcomes, this review aspires to consolidate and disseminate the current understanding of hair loss and its related disorders. By examining the multifaceted nature of alopecia, we hope to equip medical practitioners with the knowledge necessary to navigate the intricacies of hair loss diagnoses, and ultimately, to offer more effective and tailored treatment strategies to patients affected by this common but often enigmatic clinical complaint (1,2).

Methods

A comprehensive evidence search was conducted, encompassing various bibliographic sources, including scientific databases, specialized journals, and relevant books. Specific keywords such as "hair loss," "alopecia," "hair disorders," and "trichology" were utilized to ensure the thoroughness of the search. Inclusion criteria were established to select relevant and high-quality studies, considering publication dates and research types. The review prioritized the incorporation of investigations covering a broad spectrum of alopecia, ranging from common to rare conditions, resulting in the inclusion of a total of 15 studies.

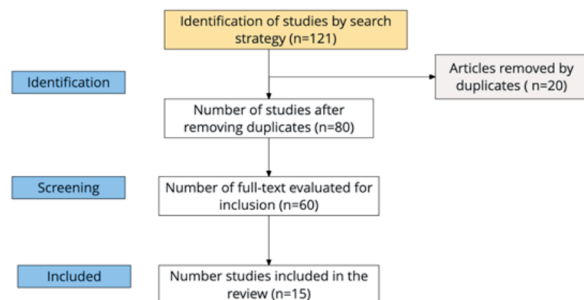


Figure 1. PRISMA.

Hair Biology

The human scalp houses a remarkable array of 100,000 to 150,000 hair follicles, each sitting atop a dermal papilla - a mesenchymal tissue collection with inductive properties. The dermal papilla plays a pivotal role in fetal hair follicle development and influences follicular cycling and hair growth. Hair follicles consist of four segments - the bulb, suprabulbar region, isthmus, and infundibulum. The hair shaft comprises three main components: the medulla, cortex,

and cuticle. Hair types include terminal and vellus hair follicles, with transitioning between them during puberty and in certain pathologic conditions. The hair cycle involves anagen (growth), catagen (transformation), and telogen (rest) phases, with anagen being the most prominent and telogen accounting for shedding. Understanding these intricate aspects of hair anatomy aids in comprehending hair disorders and potential therapeutic approaches (3).

Classification

Hair loss disorders encompass a vast and heterogeneous group of conditions, each presenting diverse clinical features, pathological findings, and etiologies. These disorders can arise from disturbances in hair cycling, inflammatory processes damaging hair follicles, or inherited/acquired abnormalities in hair shafts (4).

The primary divisions for these conditions are cicatricial (scarring) alopecia, nonscarring alopecia, and structural hair disorders. Cicatricial alopecias lead to permanent hair loss due to irreversible hair follicle damage. Nonscarring alopecias, on the other hand, do not cause permanent damage, allowing for spontaneous or treatment-induced regrowth. Structural hair disorders entail abnormalities within the hair shaft, resulting in hair fragility (5).

Cicatricial alopecia encompasses lymphocytic, neutrophilic, and mixed types, each defined by specific histologic inflammation patterns. Examples include alopecia mucinosa, central centrifugal cicatricial alopecia, discoid lupus erythematosus, keratosis follicularis spinulosa decalvans, lichen planopilaris, frontal fibrosing alopecia, and pseudopelade of Brocq (6).

Nonscarring alopecia includes focal (alopecia areata, alopecia syphilitica), patterned (androgenetic alopecia in men and women, trichotillomania), and diffuse (anagen effluvium, loose anagen syndrome, telogen effluvium) hair loss. Structural hair disorders such as trichorrhexis nodosa and trichoptilosis can result from external insults or harmful hair care practices (7).

Moreover, inherited and acquired structural hair disorders may lead to brittle or fragile hair, as seen in Menkes disease, monilethrix, trichothiodystrophy, trichorrhexis invaginata, and Netherton syndrome. These classifications aid in recognizing and diagnosing different forms of hair loss, guiding appropriate management strategies for patients facing these challenging conditions (8).

Patient Interview

A thorough patient interview can provide valuable insights for diagnosing hair loss conditions. It should cover the nature of

hair loss, medical history (including medication and supplement use), hair care practices, and family history related to hair loss and potential causes. Description of hair loss - Assessing the course and pattern of hair loss, along with associated symptoms, helps narrow down the differential diagnosis for nonscarring alopecia. The duration and rate of progression distinguish congenital and acquired disorders, and acute or chronic conditions. Understanding the location and pattern of hair loss aids in identifying focal, patterned, or diffuse hair loss. Patients should be asked about additional sites of hair loss since some scalp hair loss conditions can involve other areas (9).

Extent of hair loss - For diffuse hair loss complaints, knowing that normal hair loss ranges from 50 to 150 hairs per day is essential for evaluating the magnitude of the problem. Notably, patients who shampoo infrequently may notice more hair loss on shampoo days due to manual dislodging of telogen hairs. Associated symptoms - Although not always present, symptoms like pain, tenderness, pruritus, or burning sensations can support a diagnosis. In asymptomatic hair loss cases, symptoms might indicate additional underlying disorders. Differentiation of hair shedding from hair breakage - Patients may help distinguish hair shed from the follicle (with a small white bulb at the root) from broken hairs without the follicular portion. Hair care practices - Questions about hair care are relevant in cases of hair breakage or traction alopecia, where damaging practices or prolonged hair tension may be the cause (10).

Medical and family history - The patient's medical history can provide insights into potential causes of hair loss, such as drugs, poor diet, medical disorders, psychologic stress, weight loss, deficiencies, thyroid issues, childbirth, or poisoning. Obtaining a family history of hair loss is valuable since genetics contribute to susceptibility to various hair diseases. Patients might deny a family history if their parents weren't fully bald, so inquiring about hair thinning and balding helps identify hereditary alopecia (11).

Physical Examination

When evaluating patients with scalp hair loss, a comprehensive physical examination is crucial, involving the scalp, hair, and other body sites. It is best to position the patient comfortably for scalp examination, ensuring good lighting. Visual inspection of the scalp helps identify physical clues for diagnosis, such as erythema, scales, papules, pustules, erosions, or excoriations. The presence of follicular ostia in affected areas is noted; their absence suggests scarring alopecia. Hair density and distribution are assessed by parting the hair and comparing frontal and occipital hair density, especially for female pattern hair loss (12).

Terminal and vellus hair differentiation aids in diagnosing male and female pattern hair loss. Detecting broken hairs indicates structural hair disorders. Hair fragility can be assessed by gentle tugging of hair fibers. Features associated with hair loss forms - Specific patterns or abnormalities may offer diagnostic clues, such as exclamation point hairs in alopecia areata or tufted folliculitis in cicatricial alopecias. Dermoscopy or trichoscopy is useful for magnifying skin structures, including the epidermis, follicular ostia, hair shafts, and blood vessels. Certain findings are linked to particular hair loss forms, aiding in diagnosis. The hair pull test helps identify active hair loss. Grasping 50 to 60 hair fibers close to the scalp and gently tugging can reveal excessive shedding. The type of hairs removed (telogen, anagen, dystrophic, or broken) can be microscopically examined. Thus, examining skin, nails, teeth, and other areas during the initial evaluation helps identify associated features and additional sites of involvement (13).

Management

The initial treatment for alopecia aims to manage and address the underlying cause of hair loss. Before initiating any specific therapy, a comprehensive evaluation of the patient's medical history, scalp condition, and hair loss pattern is essential for accurate diagnosis. For cases of androgenetic alopecia, the most common form of hair loss, over-the-counter topical medications such as minoxidil are often recommended as a first-line treatment. Minoxidil has demonstrated effectiveness in stimulating hair growth and is generally well-tolerated by patients. In addition to minoxidil, healthcare providers may prescribe oral medications for certain types of hair loss. Finasteride and dutasteride are FDA-approved oral drugs that work by inhibiting the production of dihydrotestosterone (DHT), a hormone associated with androgenetic alopecia. These medications are typically used in men with male pattern hair loss, but they may also be considered for postmenopausal women with androgenetic alopecia. It is important to note that these drugs should be used under medical supervision, as they may have side effects that need to be monitored (14).

For patients with inflammatory forms of alopecia, such as alopecia areata, corticosteroids may be prescribed. These can be administered topically, injected into the scalp, or given orally, depending on the extent and severity of the hair loss. Corticosteroids work by suppressing the immune response that attacks hair follicles in cases of alopecia areata. Another emerging treatment option is the use of platelet-rich plasma (PRP) injections. PRP contains growth factors that may promote hair growth and improve the overall health of the scalp. While these initial treatments can be effective for many individuals with alopecia, it is crucial to emphasize that results may vary depending on the type of hair loss and individual response to treatment. Some patients may require a combination of therapies or more aggressive approaches, such as hair transplantation, to achieve desired outcomes. Moreover, ongoing research and clinical trials are continuously expanding the treatment landscape for alopecia, offering hope for even more effective and targeted therapies in the future (15).

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