

Hair Loss- An analysis and Updated Treatment

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Abstract: Amongst commonest problems patients complain about when they visit their dermatologist is hair loss. Depression, distress and serious psychological disturbances are commonly related to it. Hair loss may last over both short and long time span. A great number of examinations have to be done in order to confirm the diagnosis, which includes laboratory testing, clinical tests, scalp biopsy and physical examination. The overall view of the main typical causes of loss of hair will be presented in this article together with up-to-date explanation about the advance therapies for these problems.

I. Introduction

Amongst the commonest problems patients complain about when they visit their doctor is hair loss. Depression, distress and serious psychological disturbances are commonly related to it. Hair loss may last over both short and long time span. A great number of examinations have to be done in order to confirm the diagnosis of hair loss which includes laboratory testing, clinical tests, scalp biopsy and physical examination. Nutrition, infection, environment, auto-immune and congenital factors are all seen as possible triggers. No scarring alopecia can appear in different forms, but the most usual ones are the androgenic alopecia, alopecia areata and telogen effluvium. On the other hand, scarring alopecia can be induced by discoid lupus, lichen planus, erythematosus, infections or trauma. Other kind of disorders is trichotillomania, traction alopecia, tineacapitis and abnormalities in the hair shaft. Successful treatment and proper patient care are highly dependent on appropriate assess and management.

II. History

One of the most important things in making a diagnosis is taking a detailed and complete clinical history. The patient provides information on illness, weight loss, surgeries and anesthesia, hormonal diseases, thyroid diseases, nutrition, history related to hair loss that runs in family and also history of psychological distress. Questions about location and duration of the hair loss must be asked as well. The patients must be given advice for screening of the patches or scattered loss of hair.

III. Physical Examination

After the taking and documenting of the patient's history, the doctor examines the patient thoroughly. The first thing to be checked out is the skin type of scalp. The scalp color, distribution and presence of the hair follicles, evidence or scaling must be noted. The attention should also be paid to hair density to determine is it normal or diminished. The "pull test" is performed in order to assess the hair shedding level. This test can show degree of the hair loss. It is carried out in a way that physician grab 25-35 hairs with their fingers and try to pull apart gently. If above 10 hairs remain in his/her hand, they suggest major hair loss. One hair is taken as sample for the microscopic analysis. An important instrument for hair and scalp disorders, such as Genodermatoses, is light microscopy of the hair.

IV. About Hair Cycle

The anagen or growth, telogen or resting and catagen or regressions are all phases which hair follicles go through. It is important to understand this process because most patients suffer from the changing cycle of hair follicle. Disorders that cease the activities of mitotic of the anagen follicles like drugs and alopecia areata, causes anagen hair loss. Unlike anagen, hair loss by telogen is caused by injuries that can result in early follicle telogenization [3].

V. The Alopecia

5.1. The Androgenetic Alopecia

The commonest kind of the hair loss is AGA- Androgenic alopecia. In women, alopecia is usually diffused over the scalp in mid-frontal area i.e. female pattern of hair loss. This is caused by the miniaturization of hair follicle in the follicular units. This denotes a growing decline in pigmentation, diameter and the hair shaft length. AGA is usually activated by the androgens that are present in persons genetically susceptible. The

increased activity of 5 α -reductase and dihydrotestosterone (DHT) levels are present in hair follicles of AGA patients [5]. In these follicles that are genetically susceptible, DHT links to androgen receptor and hormone-receptor complex causing the alteration of normal follicles into the miniaturized ones. When amount of the terminal fibers pre follicular unit decrease it will spread out alopecia. Androgenetic alopecia mostly has a psychological impact. The hair loss in men is mostly assumed to be age –related, while in women it is always unexpected.



Figure 1: Androgenetic Alopecia

Some authors suggest that AGA might be associated with the thyroid disorders, although thyroid substitution doesn't affect alopecia. Postpartum telogen effluvium and similar conditions can worsen AGA. In premenopausal women, the AGA may be an indicator of hyperandrogenism. Contraception containing estrogens has an advantageous influence on AGA because of its proliferative effect on dermal papilla cells [6]. On the other hand, contraceptives containing androgenic progestins like nortestosterone - derivatives levonorgestrel can activate this condition. Hair loss is the result of levonorgestrel intrauterine usage.

5.2. The Alopecia Areata

This is a hair loss condition where both scalp and body can be affected. It is an inflammatory and autoimmune disorder which strikes 2% population. The main characteristic of AA is hair loss in patches. When the whole scalp is affected it is called alopecia totalis, while losing hair from all body is called alopecia universalis. Pathology reveals an increase in number of telogen and catagen follicles including presence of the inflammatory lymphatic infiltrate and the peribulbar area.

Clarifying of the pathogenesis takes into account many factors. The reactions of organ-specific autoimmune, non-specific immune and genetic constitutions are considered to be possible reasons. The idea that is discussed the most is that some individuals are genetically predisposed to an autoimmune reaction against hair follicles. Certain triggering factors like stress and viral infection may start this process. Thyroid diseases, another autoimmune disorder, can also be one of the causes [4].

Several authors documented that psychological factors have the influence on evolution, development and the therapeutic management of AA. There is a high comorbidity of the psychiatric disorders, at first place depression, different phobias and anxiety.

Alopecia areata that follows gynecological and cardiac surgical procedures has been reported. Khalaf and his colleagues were exploring the actual etiology of the AA in these patients, even though ischemia caused by pressure is the most probable reason [8].

5.3. The Chemotherapy Induced Alopecia

The use of chemotherapy drugs for cytotoxic anticancer lead to the appearance of alopecia by eroding the rapidly increasing epithelium of hair follicle. It is estimated that 65% of patients suffer from hair loss due to chemotherapeutic medicament and the treatment protocol [3]. Anagen effluvium caused by chemotherapy is reversible in most cases, but there are certain chemotherapy agents that induce alopecia permanently. After regrowth of hair, certain anomalies such as the thinning of hair and change in texture of hair may be observed. Patients, especially women, find chemotherapy as induced alopecia psychologically devastating, even though it is only a temporary matter.

5.4. The Trichotillomania

At least 3.7 million people in the US are affected by the trichotillomania, also referred to hair- pulling disorder. It is an impulse-control disorder which results in significant functional deterioration. This disorder usually starts at childhood stage, either in the preschool or in preadolescent years. It is characterized by irresistible desire to manipulate and pull out the hair [1]. Studies show that it is found seven times more in children than in the adults. This disorder, just like nail-biting and thumb-sucking, may start as a habit. Strangely shaped patches can be found when physically examined. With broken and short hairs that vary in length, the possible interventions for trichotillomania are behavioral treatments of minimally invasive and appropriate psychoeducation.

VI. The Telogen Effluvium

It is a disorder caused by the perturbation of hair cycle which leads to an increased loss of normal club hairs. It was Klingman who described it first in 1961. His hypothesis argued that no matter what caused the hair loss, follicles behave in the same way and cause premature disappearance of anagen. Many are subclinical cases so it makes it hard to determine the true occurrence of this disorder. The drugs, stress and iron deficiency are considered to be common causes of TE [2].

6.1 The Acute Telogen Effluvium

An acute hair loss two to three months after the triggering event like surgical trauma or the high fever was the first description of classic telogen effluvium. There are a number of well-known causes which include stress, drugs, weight loss, hyperthyroidism, hypothyroidism and the other disorders which may lead to the inflammation of scalp like contact dermatitis. If no obvious reason is detected the patient is screened for the syphilis, antinuclear antibody and thyroid disease. No visible alopecia occurs in TA, the common complaint of the patient is regarding the falling of hair. In severe cases, daily shedding can be 100 - 200 of telogen hairs [8].

6.1.1. The Nutritional Deficiency

Nutritional deficiency of iron is the most usual cause of the hair loss in the premenopausal women. In this population, hemoglobin and serum ferritin must be observed to clarify all the possible causes of the hair loss. If the level of ferritin is below 30 mg/ml iron supplementation is prescribed. Other factors that can activate diffuse telogen hair loss include deficiency of vitamin D, caloric restriction, zinc deficiency, severe chronic and protein starvation.

6.1.2. The Stress

It is suggested that hair cycles may be significantly influenced by neurotransmitters, cytokines and neuro-hormones that are released while stress response. Further evidence was provided for the existence of the axis of brain-hair follicle by Arck and colleagues. This theory argues that androgenic stress activates alterations in the actively growing follicles of hair and helps their transition to involution phase [1].

6.1.3. The Drugs

There are a number of the drugs which can induce hair loss. The extent of alopecia depends on the individual predisposition and drug. Even with proper dosages, some drugs produce extensive hair loss, while others cause only hair abnormalities. The two ways by which anagen follicles are affected by drugs are: telogen effluvium i.e. when follicles are precipitated in premature test; and anagen effluvium i.e. mitotic activity is stopped with sudden cessation of matrix cells [2]

Among some of the drugs that activate telogen effluvium are anti-hyperlipidemia, retinol interferon and anticoagulants drugs. Different side effects including the loss of hair from scalp, eyebrows and the pubic area are induced by psychotropic medications. When the treatment is over the process is reversible.

6.1.4. The Postpartum

This hair loss at most causes occurs after two - four months of delivery and can last up to a year. This alopecia is considered to be very common, even though its prevalence is unknown. In cases where there are no nutritional deficiencies or any other disorders patients will recover completely after another six - nine months. But this can trigger the development of the alopecia areata among the predisposed patients [3]. The loss of hair is present but it is never total. Slower hair growth and decreased density of hair can be experienced by some patients.

6.2. The Chronic Telogen Effluvium

The main characteristic of is hair shedding which lasts longer than six months with oscillating course over the years. This is idiopathic with real cause undetermined. Only when all other causes are excluded, including androgenic alopecia, diagnosis of the chronic telogen effluvium takes place. Patients usually report reduced hair density and scalp pain.

VII. The Treatment

7.1. The Androgenetic Alopecia

7.1.1. The Topical Minoxidil

AGA is now widely treated with topical minoxidil—2 per cent and 5 per cent solutions are available. FDA approved 2% solutions for female patients. This stops the hair loss in patients with AGA and stimulates new hair growth. A temporary shedding in first four months and the contact dermatitis are common side effects.

7.1.2. Finasteride

Finasteride is the synthetic kind-2 5 α reductase inhibitor. Several authors have been examining it as the treatment for the female hair loss. Although the solid evidence of its efficacy is very limited, finasteride can be considered as the treatment in patients who do not react to topical minoxidil. It is proven to be well tolerated. The better results are shown with dosage of the 2.5 mg/daily in comparison to the 1.0 mg daily. Due to its teratogenicity this is contraindicated at the time of pregnancy. While receiving it, premenopausal patients have to stick to reliable contraception. Usual dosage for men is having 1 mg daily. [3].

7.2. The Anti-hormonal Therapy

This is suggested to help in treating the female alopecia in women having normal hormone level. Spironolactone behaves as potassium sparing diuretic as it is like aldosterone antagonist. It decreases the production of adrenal androgen and blocks androgen receptors in the target tissues. Female patients have been using this medication off-label so that they can stop hair loss. Pregnant women shouldn't be using it because of teratogenic effects.

Cyproterone acetate medicament blocks androgen receptors and expresses weak glucose action and activity of strong progestational. This medication doesn't activate hair regrowth, but it does reduce hair shedding. Premenopausal women should take 100 mg a day for ten days of every menstrual cycle, while with postmenopausal women the dosage should be 50 mg a day constantly. In order to assess the efficiency of oral anti-androgen therapy, Sinclair and colleagues carried out a research on 80 women with the FPHL. Half of them were given 200 mg of spironolactone daily, while other half was taking cyproterone acetate (premenopausal women received 100 mg daily over the course of 10 days every month, and postmenstrual patients received 50 mg daily) [6].

No serious differences in the outcome between spironolactone and cyproterone were found. Thirty-five women (44%) had regrowth of hair, thirty-five (44%) experienced no difference in the hair density after and before the treatment, and only 10 women (12%) continued to lose hair after the treatment.

7.2.1. The Alopecia areata

Having in mind that alopecia areata is not considered to be serious condition, the treatment is optional. If it is treated, certain medications can be helpful. Those include systemic, topical steroids and intralesional for occlusion while with diphencyprone and squaric acid dibutylester works as topical immunotherapy.

7.2.2. The Chemotherapy induced in alopecia

Some authors argue that an effective method in prevention of hair loss at the time of chemotherapy is scalp cooling. The baldness period after chemotherapy can be shortened by taking topical 2% minoxidil as the therapy for hair regrowth. Important elements in any treatment are education, psychological support and the self-care.

7.2.3. The Trichotillomania

The hair pulling disorder is easily treated with pharmacotherapy and behavior therapy. Those treatments have shown excellent results in adults. Medications mostly used are the inhibitors of selective serotonin at a high dosage and the domipramine. There are also other drugs such as the opioid blockers, glutamate modulators and atypical neuroleptics that are still to be proved as a treatment for the trichotillomania [10].

7.3. The Telogen Effluvium

7.3.1. The Iron Supplementation

Telogen hair losses in female patients who have neither underlying disorders nor systemic inflammation are in correlation with the levels of serum ferritin equal to the 30 ng/mL or below. Iron sulphate must be taken until serum ferritin reaches 70 mg/ml.

7.3.2. The Biotin Supplementation

The hair syndrome which cannot be combed can be treated with coenzyme R or vitamin H also known as biotin. Biotin can increase the hair root strength, make scaling disappear and accelerate regrowth. % mg daily of biotin is recommended.

7.3.3. The Cysteine Supplementation

This is not proven that cysteine supplements can increase or decrease quality of the hair and growth cycle. The recommended dose is 500 mg a day.

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