THERAPEUTICS OF ALOPECIA

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Abstract: Though hair loss (alopecia) is not a debilitating or life threatening sickness, the very thought of becoming bald can lead to emotional stress and traumatic experience for those who suffer from premature or excessive hair loss. Hair loss is one of the most common complaints among all patients consulting a dermatologist and is usually associated with severe psychological disturbances, distress and symptoms of depression. Today, hair loss or thinning, and hypertrichosis or hirsutism are common complaints in clinical dermatology, but patients seeking advice for their hair problem are not necessarily completely bald or overall haired. The difficult task in diagnosing hair and hair disorders is to distinguish between a true disorder and a subjective complaint and to analyze the underlying pathogenesis. Patients consult for focal or diffuse effluvium, non-scarring or scarring alopecia, changes in hair structure or color and hair graying Herbs and herbal drugs have created interest among the people by its clinically proven effect like hair loss.

Key Words: Hair, hair diseases, scarring alopecia, hair graying, hypertrichosis, herbal.

Introduction:

Hair is a protein filament that grows through the epidermis from follicles deep within the dermis. The fine, soft hair found on many nonhuman mammals is typically called fur; wool is the characteristically curly hair found on sheep and goats. Found exclusively in mammals, hair is one of the defining characteristics of the mammalian class. Hair is an epidermal appendage that lies within the dermis. Each hair emerges from a tubular invagination called a follicle. The follicle resembles a narrow pocket within the skin, as if a tiny finger had pushed the epidermis down into the Dermis and the underlying subcutaneous tissue. The lower extreme is penetrated by the Dermal Papilla an upwardprotrusion of connective tissue which produces microscopic cells of several kinds from which the hair is formed and developed by cellular elongation and keratinisation. Hair is closely associated with sweat gland and sebaceous gland activity.Each hair-producing follicle with its sebaceous gland is known as a pilo-sebaceous unit.

The arrector pili muscle joins the wall of the follicle to the epidermis and is responsible for the erection of hairs and goose flesh during cold weather or emotional stresses . The hair shaft is currently believed to be a dead structure composed of cells which die after leaving the dermal papilla. As all follicles are established before birth no new ones are created thereafter. All characteristics are genetically determined. Their hairshaft – a keratinised structure composed of an outer cuticle (tile-like protective layer of keratinised cells) the cortex where cells are held firmly together, and an inner medulla where the cells are larger more loosely connected and partially separated by air spaces

Fig 1: Stages of hair fall

The hair is approximately cylindrical. The hair can be divided into three parts length-wise-

1. The bulb, a swelling at the base which originates from the dermis
2. The root, which is the hair lying beneath the skin surface
3. The shaft, which is the hair above the skin surface.

In cross-section, there are also three parts-

1. The medulla, an area in the core which contains loose cells and airspaces
2. The cortex, which contains densely, packed keratin
3. The cuticle, which is a single layer of cells arranged like roof shingles.

Rate of growth:

Normal Caucasian hair growth rate is 1-2 cm per month. Researchers have shown that this rate of growth may reduce beyond the length of approx 27cm. Afro-Caribbean hair growth rate is approximately half that of Caucasian, and due to the fragility of their multi-helixal structure, rarely attain great length. Asian hair-shafts grow rapidly exceeding the average for Caucasians and may attain great length.

Hair Growth Cycle:

Growth phase of about 30-45 days explaining why they are so much shorter than scalp hair. We all lose about 100 hairs per day, out of the 100,000 contained by the average scalp. Lifespan: The average lifespan of a single hair is 4.5 years; the hair then falls out and is replaced within 6 months by a new hair.Each hair follicle undergoes a cycle of activity. The hair grows to a maximum length, then hair growth ceases and the hair is shed and replaced. At any one time we only have around 85% of our hair on our head at a time, the rest being in the resting stages. The hair growth cycle has three distinctive phases:

Fig 2: Growth cycle of hair

Anagen: the period of active growth

Catagen: the period of breakdown and change

Telogen: the resting stage before resumption of growth

Anagen: The epidermal cells surrounding the dermal papilla form the germinal matrix or root of the hair. These cells are constantly dividing, and as new cells are formed they push the older ones upwards where they begin to change shape. By the time the cells are about one-third of the way up the follicle they are dead and fully keratinized. A scalp hair will grow actively for between one and a half and seven years (three years being an average growth period).

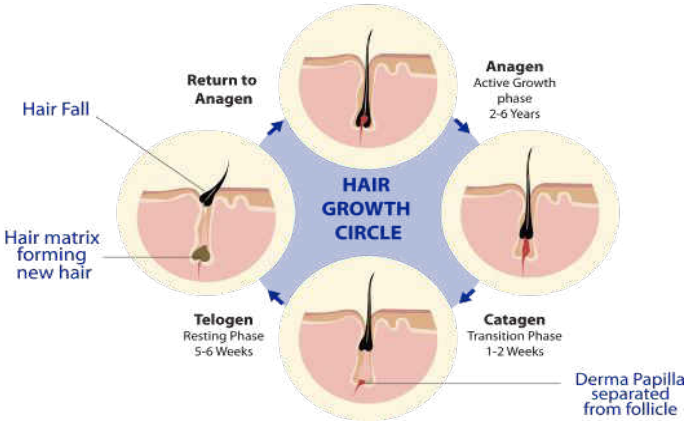

Fig 3: Hair growth cycle

Catagen: This is the end of the active growth period, and is marked by changes occurring in the follicle. The hair stops growing and becomes detached from the base of the follicle forming a club hair. The hair bulb begins to break down, resulting in the follicle becoming shorter. A small section of the outer root sheath remains in contact with the group of cells that formed the papilla. This period of breakdown or change lasts about three weeks. As the inner root sheath breaks down, the hair remains in the follicle due to its shape. On average, 1% of follicles are in the catagen stage.

Telogen: The section of remaining root sheath still in contact with the papilla is known as the secondary or root germ. It is from this germ that a new hair can grow. The shortened follicle rests for about three months. The hair may be brushed out at this time or at the onset of anagen. On average 14% of follicles are in the telogen stage. After the telogen stage the cycle returns to anagen and the root germ begins to grow downwards and forms a new bulb around the dermal papilla. It is the lower end of the germ that forms the new bulb, producing a new hair. The upper part of the germ forms the new cells that lengthen the follicle below the club hair. The new hair may push the old hair out. Sometimes therefore you may see two hairs in the same follicle.

Causes:

Physiologic

- Physiologic effluvium of the newborn
- Postpartum effluvium
- Early stages of androgenetic alopecia
- Injury or stress
- High or prolonged fever (e.g., malaria)
- Severe infection
- Severe chronic illness
- Severe psychologic stress (life-threatening situations)
- Major surgery
- Hypothyroidism and other endocrinopathies
- Severe dieting or malnutrition

Drugs and toxins

- Antikeratinizing agents (e.g., etretinate [Tegison])
- Anticoagulants (especially heparin)
- Antithyroid agents
- Alkylating agents
- Anticonvulsants
- Hormones

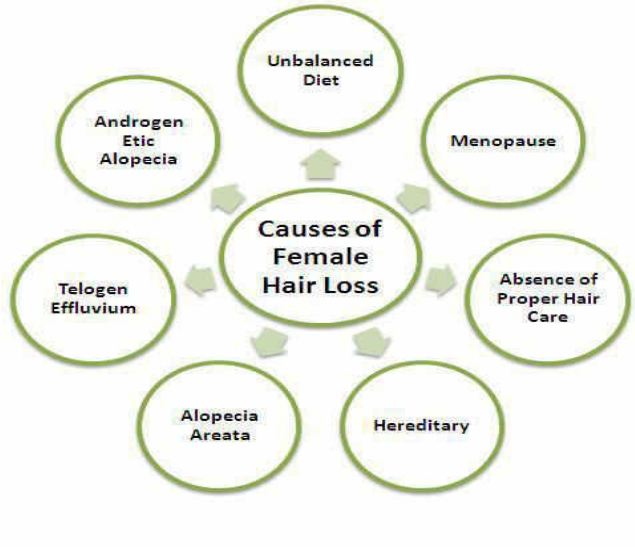

Fig 4: Causes of Hair loss

Effective Factors in Hair Loss:

Normally 90% of hairs are in growth phase and 10% are in the resting phase and on average, about 50 to 80 hairs during washing and combing are falling. So when a hair falls, a new hair takes its place. The problem begins when the falling hair is further and faster than the growth of new hair or their growth cycle is short and fails to reach the maximum growth of anagen. In this case, after some time, the total number of hairs is reduced or hair is thinner and person may notice a decrease in the volume of hairs. This is the main cause of hair loss. Hair loss in men and women are different. 90% of men have some degree of alopecia. This factor is related to both genetic and hormonal reasons. Also, there are many different causes in women hair loss. One of the most common causes of female hair loss is iron deficiency. Because of monthly bleeding and difficulty impotence diet that some of them take, suffering from anemia or their bodies iron stores are reduced. Usually what is seen in the omen is reduction of density of hair, not bald. Various factors are effective in hair loss, some of which are only effective in women and some in men . Some of them are mentioned below.

Genetic factor:

This is considered as the most effective hair loss factor in men and women. Androgenetic Alopecia or AGA is often used to describe a type of hair loss which is characterized by a pattern in men and women who are prone to genetic causes of hair loss. The word Andro is used to show the effect of androgens that are testosterone and Dihydro - testosterone (DHT),which are involved in men's hair loss.Genetic implies the fact that AGA is a genetic problem inherited from the parent genes. This kind of hair loss in men is called Male Patterned Hair Loss (MPHL) and in women Female Patterned Hair Loss (FPHL).

Diseases

Some diseases such as polycystic ovarian disease, thyroid, connective tissue diseases like lupus after menopause, different kinds of cancer, diabetes, cholesterol, etc. can cause hair loss.

Iron deficiency

This factor, especially in women who have heavy menstrual bleeding and who are at iron deficiency risk, can be considered as a powerful factor in the hair loss.

Drugs

Medications such as drugs, blood diluting drugs such as Warfarin and Heparin, anti-convulsion medications like Dilantin, an anti-gout drugs such as Allopurinol and Colchicine, anti-pressure drug especially Beta-blockers, anti-inflammatory drugs such as Prednisolone, antidepression drugs such as Lithium, contraceptives, high intake of vitamin A, drugs related to atrophy are effective in hair loss.

Cosmetics

Hair dye, hair gel, non-standard softeners, hair ironer and using a hair dryer are effective in hair loss.

Stress and depression

It has been known that there is a relationship between emotional and physical stress such as serious illness or surgery and hair loss. Depression resulting from separation, job loss, fever, infection, and so on has a remarkable effect on hair loss.

Gender

Regarding the different patterns of hair loss in men and women, this is a very important factor in hair loss.

Nutrition

Malnutrition and vitamin deficiencies especially iron and protein deficiency are other significant factors in hair loss. Fruits, vegetables, dairy, meat, cereal juice, bran, soy,etc. have a large impact on hair growth and loss.

Surgery record

Stress and the use of anesthetics and bleeding which are associated with surgery are very effective in hair loss.

Pregnancy

Some women experience hair loss after their child delivery which lasts for 1 to 6 months that can also occur after the abortion.

- The obsession with hair loss
- Zinc deficiency
- Chemotherapy
- Radiotherapy
- Age

These factors are all more or less effective in hair loss. However, other factors such as fungal infections, bacterial skin diseases, burns, etc. are also effective

Fig 5: Reasons for hair loss

Signs and symptoms:

Signs of hair loss and hair loss conditions vary between man, women and children. However, people of any age or sex may notice more hair collecting in their hairbrush or in the shower drain. The signs of hair loss and hair conditions may include:

- Thinning hair on the scalp
- A receding hairline
- A horseshoe-shaped pattern that leaves the crown of the head exposed.
- Complete hair loss of all hair on the body
- Anemia
- Rapid weight loss

Fig 6: Symptoms of hair loss

Treatment:

Androgenetic Alopecia

1. **Topical Minoxidil**

Topical Minoxidil is now the most widely recommended treatment for androgenetic alopecia. It is available in 2% and 5% solutions for hair loss. The 2% solution is the only one approved by FDA for use in female patients. It stimulates new hair growth and helps stop the loss of hair in individuals with androgenetic alopecia (AGA). Side effects include a transient shedding during the first 4 months of use and contact dermatitis .

2. **Finasteride**

Finasteride is a synthetic type-2 5α-reductase inhibitor and has been studied by several authors as a treatment for female pattern hair loss. A review study published in 2011 shows that objective evidence of efficacy is limited, but it may be considered as a treatment for patients who fail topical minoxidil. Finasteride is well tolerated; however, premenopausal patients must adhere to reliable contraception while receiving it. The dosage of 2.5 mg/daily seems to show better results when compared to 1.0 mg/daily. It is contraindicated in pregnancy, due to known teratogenicity. For men, the dosage is 1 mg once a daily.

Anti-Hormonal Therapy:

Reviews suggest that anti-hormonal therapy is helpful in treating female pattern alopecia in some women whohave normal hormone levels. Spironolactone is an aldosterone antagonist employed in clinical practice as a potassium-sparing diuretic. It reduces adrenal androgen production and exerts competi- tive blockade on androgen receptors in target tissues. This medication has been used off-label in female pattern hair loss for over 20 years and it has been shown to arrest hair loss progression with a long-term safety profile. It should not be used in pregnancy due to its teratogenic ef- fects.Cyproterone acetate is an androgen receptor blocker with strong progestational activity and a weak glucocor- ticoid action. It seems to decrease hair shedding, but does not seem to promote regrowth. The dose required for premenopausal women is 100 mg daily for 10 days of each menstrual cycle and postmenopausal women should use 50 mg daily continuously. Sinclair and colleagues performed an intervention study involving eighty female patients with FPHL to evaluate the efficacy of oral anti- androgen therapy in the management of women with FPHL. Forty patients received spironolactone 200 mg daily and 40 received cyproterone acetate, either 50 mg daily or 100 mg for 10 days per month if premenopausal. This study showed no significant difference in the results or the trend between spironolactone and cyproterone acetate. Thirty-five (44%) women had hair regrowth, 35 (44%) had no clear change in hair density before and after treatment, and only 10 (12%) experienced continu- ing hair loss during the treatment period.

1.Alopecia Areata

Treatment is not mandatory considering it a benign con-dition. Spontaneous remissions and recurrences are com- mon. Some therapeutic agents can be effective. This list includes systemic, intralesional and topical steroids under occlusion and topical immunotherapy with squaric acid dibutylester or diphencyprone .

2.Chemotherapy Induced Alopecia

Scalp cooling is as a method of preventing hair loss dur- ing chemotherapy and it has been discussed by several authors as an effective option. Topical 2% mi- noxidil as a therapy for accelerating regrowth after che- motherapy has also proven to shorten the baldness period. Psychological support, education, and self-care stra- tegies are important components of any management approach.

3.Trichotillomania

Behavior therapy and pharmacotherapy are the most ef- ficacious treatments for adult trichotillomania and have shown significant reductions in hair pulling over the short term. Pharmacotherapy agents include selec- tive serotonin inhibitors at high dosage and domipramine. Recent developments in pharmacotherapy have sug- gested that other medications such as opioid blockers, atypical neuroleptics, and glutamate modulators hold pro- mise as treatment for trichotillomania

Fig 7: Comparison of treatment

Home Remedies for Hair Loss

There is nothing more attractive than a thick head of hair that glimmers with natural health. But hair loss is a problem that many people suffer from.There can be several factors behind hair loss such as environmental effects, aging, too much stress, excessive smoking, nutritional deficiencies, hormonal imbalance, genetic factors, scalp infections, use of wrong or chemically enriched hair products, certain medicines and medical conditions like thyroid disorder, autoimmune diseases, polycystic ovary syndrome (PCOS), iron-deficiency anemia, and chronic illnesses.

1. Coconut

This ingredient has several benefits for your hair. Not only does it promote hair growth, but also conditions it. It has essential fats, minerals and proteins which reduce hair breakage and is also rich in potassium and iron. You can use coconut oil or milk to prevent hair fall.

Steps:

- Warm a bit of coconut oil and massage it from your hair root to tip.
- Wash after one hour.
- Or, grate a coconut and squeeze out its milk by mixing in a little water.
- Apply it on the area where you notice thinning or balding.
- Let it stay overnight and wash off the next morning.

2. Onion juice

Onion is a rich source of sulphur which helps in hair growth by increasing collagen production. Using its juice on the scalp can help in controlling hair fall.

Steps:

- Chop one onion finely and squeeze out its juice.
- Apply the juice on your scalp and let it stay for 15 minutes.
- Now rinse with a mild shampoo and let your hair air dry.
- Use this twice a week to see results.

3. Garlic

Like onion, garlic too has high sulphur content. This is the reason why it is used in traditional hair regrowth medicines. You'd be surprised to know these beauty benefits of garlic.

Steps:

- Crush a few cloves of garlic.
- Add coconut oil to it and boil the mixture for a few minutes.
- Let it cool down a bit and then massage it on your scalp.
- You can leave it on for 30 minutes and then wash your hair.
- Do this two times in a week.

4. Henna

It is mostly used as a natural hair colour or conditioner but henna has properties that can strengthen your hair from the root. If you combine it with other ingredients, it makes for a better hair pack.

Steps:

- Take 250 ml of mustard oil in a tin can and add 60g of washed and dried henna leaves.
- Now boil the mixture the leaves burn and then filter the oil.
- Massage your scalp with it on a regular basis and store the rest in an airtight bottle.
- You can make another henna pack by mixing dry henna powder with curd.
- Apply it on scalp and hair and wash off after one hour. If you desire beautiful hair, try these other home-made henna hair packs.

5. Hibiscus

Also called shoe flower, hibiscus nourishes hair, prevents premature greying, treats dandruff and also controls hair fall.

Steps:

- Crush a few flowers and mix sesame or coconut oil to make a paste.
- Apply on the scalp and hair and leave it on for a few hours.
- Rinse off with cold water using a mild shampoo.

***6. Amla* or Indian gooseberry**

For people suffering from hair fall, *amla* or the Indian gooseberry is a blessing. It is packed with vitamin C and antioxidants that can reverse hair loss if it is in its initial stage.

Steps:

- Use either amla juice or powder and mix it with lemon juice.
- Apply it on the scalp and leave it to dry.
- Rinse hair using lukewarm water. Here are some more hair packs with amla for hair fall.

7. Egg

Egg has several ingredients that can prevent or control hair fall. It is a rich source of sulphur and ahs phosphorous, selenium, iodine, zinc and protein. All these promote hair growth.

Steps:

- Take the white of one egg and mix in a teaspoon of olive oil.
- Beat to give a paste-like consistency and apply to the entire scalp and hair.

Keep it on for about 15 to 20 minutes and then rinse with cool water and a mild shampoo. Here are some easy tips to help avoid hair loss.

Conclusion:

It is common problem that has affected men and women. They are actually the critical parameters for avoiding the scalp in full tension and compression and provide the required blood nutrients. A good control of the parameters by detumescence therapy is demonstrated in this work to be an effective and efficient approach for natural hair regrowth on the scalp.

It is investigated through many treatment are on offered including natural or synthetic based products, but natural product are continuously gaining popularly and the use of plant extract in formulation. Because synthetics based product may cause human health hazard with several side effects.

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