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**Project on:** A review of the causes, prevention and treatment of hair fall.

**Submitted By**

Akhi Islam

ID: I91-29-189

**Department of Pharmacy  
Daffodil International University**

A dissertation submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, Birulia, Savar, in partial fulfillment of the requirements for the degree of Bachelor of Pharmacy

**Department of Pharmacy  
Faculty of Allied Health Sciences  
Daffodil International University**

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## **Approval**

This thesis, **A review of the causes, prevention and treatment of hair fall**, submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy (B. Pharm) and approved as to its style and contents.

## **Board of Examiners**

Professor Dr. Muniruddin Ahamed  
Head of the Department  
Professor and Head  
Department of Pharmacy  
Faculty of Allied Health Sciences  
Daffodil International University

## **Declaration**

I hereby declare that this thesis report is done by me under the supervision of' Md. Sadman Hasib, Lecturer, Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, impartial fulfillment of the requirement for the degree of Bachelor of Pharmacy (B. Pharm). I am declaring that this project is my original work.



### **Supervised By:**

Md. Sadman Hasib

Lecturer

Department of Pharmacy

Faculty of Allied Health Sciences

Daffodil International University



### **Submitted By:**

Akhi Islam

ID: I91-29-189

Department of Pharmacy

Faculty of Allied Health Sciences

Daffodil International University

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Akhi Islam  
Author

## **DEDICATION**

“I dedicate this work to my God first, then to my parents, teachers, and friends”

## **A review of the causes, prevention and treatment of hair fall**

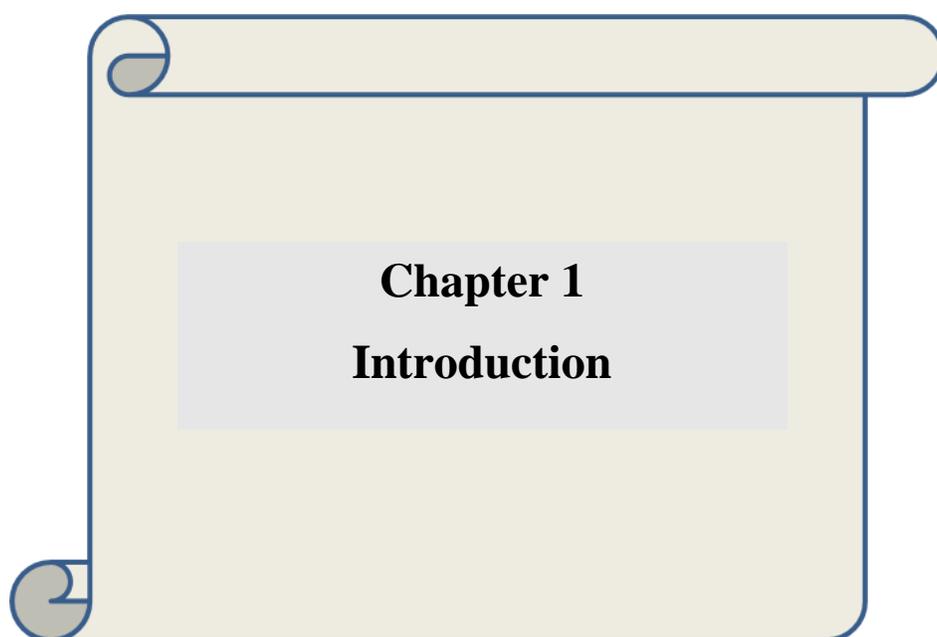
**Abstract:** Hair loss, also known as alopecia or baldness, occurs when hair begins to thin or fall out on the scalp or elsewhere on the body. The average injury involves at least the head. Hair loss might affect only a tiny patch of skin or the full body. Neither inflammation nor scarring are usually seen. Some people experience severe psychological upset when they lose their hair. Alopecia areata, which affects women, and telogen effluvium, which causes hair thinning, are the most common types of hair loss. Male-pattern baldness is due to a mix of heredity and male hormones, female-pattern baldness has a more mysterious origin, alopecia areata is an autoimmune disorder, and telogen effluvium is usually triggered by stress. After giving birth, many women get telogen effluvium. Hair loss without inflammation or scarring can also be caused by pulling out hair, albeit this is a less common reason. Chemotherapy, HIV/AIDS, hypothyroidism, malnutrition (iron deficiency), and other conditions and drugs can cause hair loss. Hair turns grey or white as a result of chemical and structural changes. As we become older, our hair gradually changes color. It normally begins at the Temples, spreads to the back of the head, and finally affects every hair on the head. Nearly two-thirds of women in their forties are affected by this, while only around half of males experience it at this age. The loss of hair can be treated with a variety of methods, including the use of natural products, Topical Immunotherapy, and Minoxidil 5% The natural plants that are used in hair-care specialties can be categorized as follows:(I) Hair-chemical plants; (ii) hair-coloring plant operators (sick) Plants (III) used to prevent dandruff and (IV) used to improve hair's health and stimulate its growth.

**Keywords:** Alopecia · Androgenic baldness · Hair loss · Herbal preparation. Topical Immunotherapy

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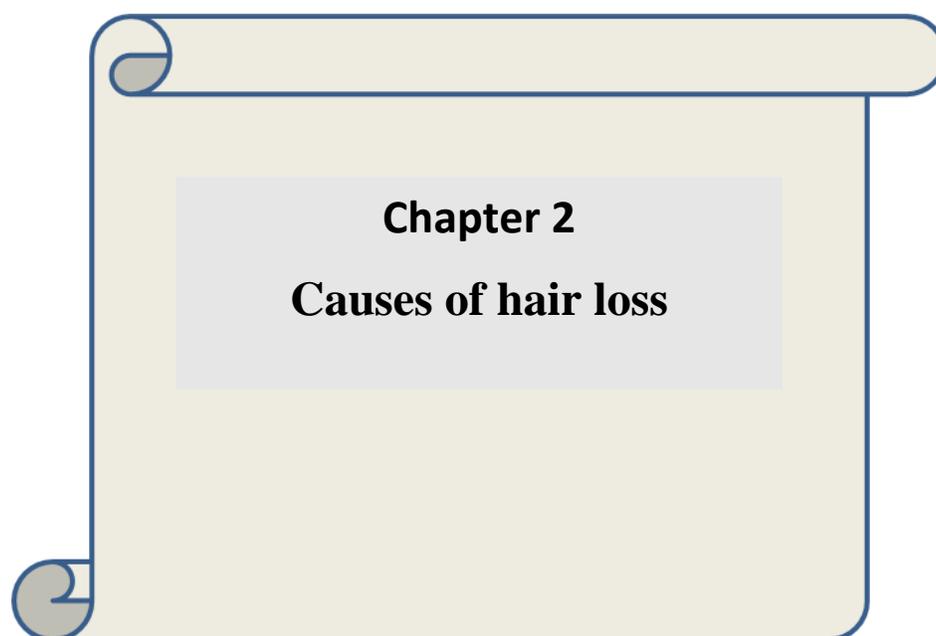
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## 1.1 Introduction:

In humans, the approximately 100,000 terminal hair follicles on the scalp are programmed to grow long, thick hair from birth (Price 1999). Three phases comprise the hair cycle. The active phase, also known as the anagen phase, is the initial stage. The hair continues to grow throughout this phase over a period of few weeks to a few years, replacing the old hair (Dawber and Van Neste 2004). The catagen phase is the transitional phase where active hair becomes resting hair. This period can extend up to three weeks (J Shapiro 2001). The hair can stay until the new hair grows and naturally pulls out the old hair, which happens throughout this transitional time. Up to three months may pass during the telogen period (L. S.-J. of the A. A. of Dermatology and 1991 n.d.). Well almost everyone in the world covets thick, shiny, and healthy hair. Unfortunately, both sexes have trouble losing hair and growing the hair they want due to a combination of genetics and environmental influences. The most prevalent form of hair loss in men is androgenic alopecia (AGA), while the most prevalent form of alopecia in women is female pattern hair loss (FPHL) (Semalty et al. 2011). Androgenic alopecia (AGA) is one of the most frequent causes of hair thinning (HL) in both sexes. Androgens play a role in androgenic alopecia (AGA) by shortening the anagen phase, increasing the number of hair follicles (HFs) in the catagen and telogen phases, and postponing the telogen-to-anagen transition (Bassino, Gasparri, and Munaron 2020). Androgens have a wide-ranging effect on human skin, influencing processes as varied as sebaceous gland proliferation and differentiation, hair growth (HG), and wound healing (Price 2003). When dihydrotestosterone binds to the androgen receptor in scalp hair follicles that are sensitive, the hormone-receptor complex activates the genes that cause the terminal follicles to gradually shrink in size (RANDALL et al. 1991). In normal hair cycling, ~90% of follicles are in anagen phase, 1% in catagen phase and 9% in telogen phase at any given time, with the proportion of follicles in anagen phase declining with age (Courtois et al. n.d.). Pattern hair loss is characterized by changes in hair cycle dynamics, including a shorter anagen phase, a higher proportion of hair in the catagen/telogen phase, and a shift toward the formation of fine, short hairs (2 cm) with a lack of pigment known as vellus hair (D. W.-I. journal of dermatology and 1998 n.d.). Anagen is shorter and follicles get smaller with each new hair cycle, which results in shorter, finer hairs that don't do a good job of covering the scalp. Androgenetic alopecia is characterized by these little hairs of different lengths and diameters (Chon et al. 2012). This review article will focus mainly on the common acquired causes of hair loss and treatment of hair loss. It will provide general physicians with the basic knowledge and management of hair loss and they can treat this hair loss.



## Causes of hair loss

### 2.1 Endocrine Imbalances

Hair loss may be a symptom of an endocrine disorder. The link between hyperandrogenism and male-pattern baldness is stronger than in female-pattern baldness (Jerry Shapiro 2007). In women, high androgen levels account for about 38% of cases of hair loss, with about 25% of these individuals showing no virilizing symptoms (Futterweit et al. n.d.). Age is also associated with a higher prevalence of androgen-related hair loss (Norwood and Lehr 2000). Ludwig first identified the pattern of hair loss in women, and he found that it most commonly started just behind the hairline and progressed forward. The hairline itself may or may not experience thinning (E. L.-B. J. of Dermatology and 1977 n.d.). In addition, hair will become fine and smooth. After further research, it was discovered that early type II androgenetic alopecia is another prevalent presentation, with diminished hair density and hair diameter at the temporalis area (Norwood and Lehr 2000). The presence of hirsutism, acne, or seborrhea on the skin is additional evidence of hyperandrogenism. However, polycystic ovarian syndrome and pituitary cancer are two uncommon but well-known diseases that have been linked to PCOS. Laboratory testing is necessary for an accurate diagnosis, however 5 reductase inhibitors or anti-androgen medications may be able to reverse hair loss in its early stages (Blume-Peytavi et al. n.d.).

However, these remedies won't work if your baldness isn't caused by androgenetic alopecia.

Alopecia can be caused by thyroid abnormalities as well as androgenic imbalances. Panhypopituitarism is an example of a condition where many endocrine glands are underactive, however they can arise independently. Patients with hypothyroidism tend to have a higher telogen percentage (Freinkel, dermatology, and 1972 n.d.). One-third or more of hypothyroid individuals may have generalized hair loss due to the suppression of cell division in the epidermis and the skin appendages caused by hypothyroidism. Rapid identification is critical because hair loss is typically irreversible even after replenishment of thyroid hormone. Up to half of hyperthyroid individuals also experience non-scalp manifestations of diffuse alopecia areata, the mechanism of which is poorly known (Sinclair 1999).

## **2.2 Infections**

*Treponema pallidum*, a bacterium that causes secondary syphilis, is responsible for hair loss in 4 percent of patients (Bi, Cohen, et al. n.d.). Diffuse hair loss, patchy hair loss, or a combination of the two is a possible clinical presentation. Hair loss occurs most frequently on the scalp, though it can also occur in less visible places like the eyebrow and chest (Cuozzo et al. n.d.). Syphilitic alopecia is frequently misdiagnosed as alopecia areata (Elston et al. n.d.). A reliable diagnostic approach for distinguishing between the two is the presence of eosinophils at the lesion sites in the latter. On biopsy, spirochetes can also be found in the afflicted hair follicles (Hyun Nam-Cha et al. 2007). Several viruses, such as Epstein-Barr, Varicella zoster, Hepatitis C, Human immunodeficiency virus, and Cytomegalovirus, have also been linked to hair loss. Because of its prevalence, VZV is the leading cause of alopecia that causes scarring (R. L. Lin et al. 2016).

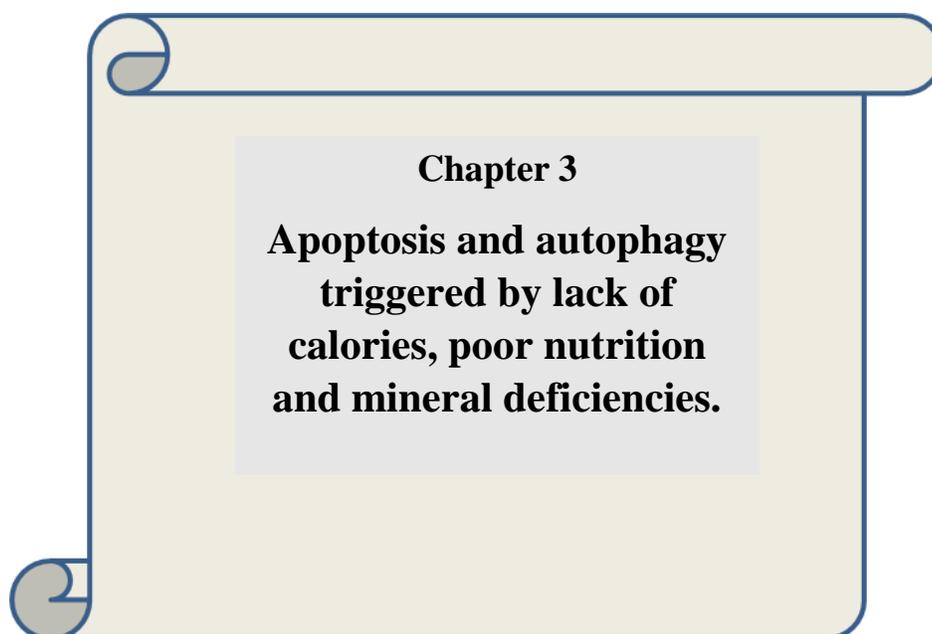
## **2.3 Malignancy**

Hair loss can occur in both the scalp and the rest of the body due to systemic and cutaneous hematologic malignancies like leukemia. Hair loss can occur in both the scalp and the rest of the body due to systemic and cutaneous hematologic malignancies like leukemia (Bi, Curry, et al. n.d.)(Busuttill 2007). The most prevalent type of cutaneous T-cell lymphoma, mycosis fungoides, is commonly linked with this symptom. The most prevalent type of cutaneous T-cell lymphoma, mycosis fungoides, is commonly linked with this symptom (Bi, Curry, et al. n.d.). Kreibich and Herman Pinkus both described the phenomenon in 1925 and 1957, respectively.

## **2.4 Role of oxidative stress in hair loss**

The oxidation of lipids, glutathione, and nitric oxide are all telltale signs of cell death caused by reactive oxygen species (ROS). In patients with hair loss, significant increases in all of these markers have been found, indicating that reactive oxygen species play a role in the underlying process of hair loss (Ontserrat Giralt et al. 1996)(Akar et al. 2002). Androgens suppress hair development by increasing TGF1 secretion (Itami 2004). Reduces hair growth by inhibiting TGF1. Also, the experiment showed that scavenging reactive oxygen species (ROS) prevented TGF-1 from being released and reversed the suppression of hair development(Shin et al. 2013). The

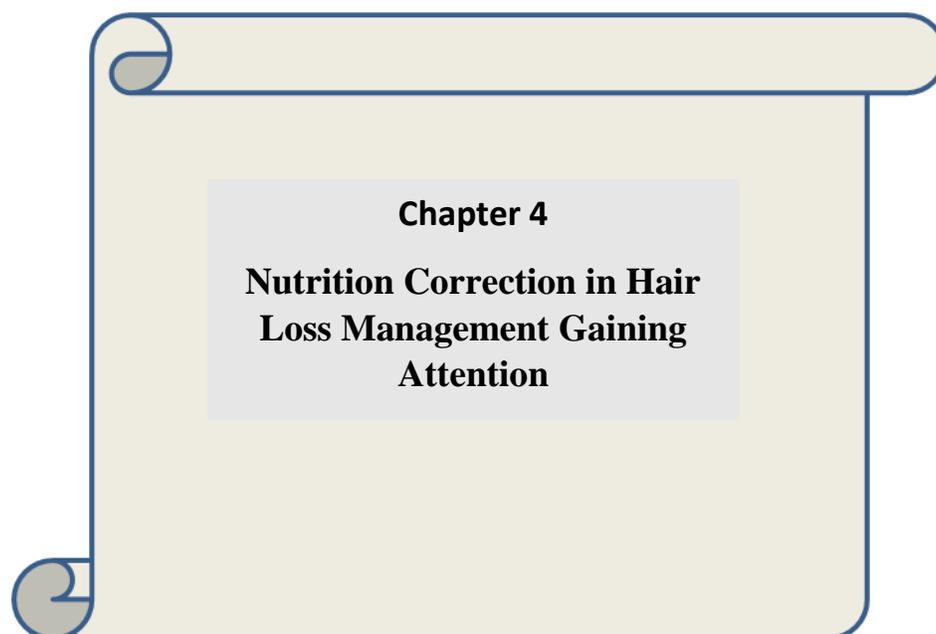
research shows that ROS scavengers are useful, and it explains why antioxidants can help with hair loss and alopecia. The study supports the use of antioxidants for treating hair loss and alopecia areata, as well as demonstrates the significance of ROS scavengers (Kalkan et al. n.d.).



### **3.1 Apoptosis and autophagy triggered by lack of calories, poor nutrition and mineral deficiencies.**

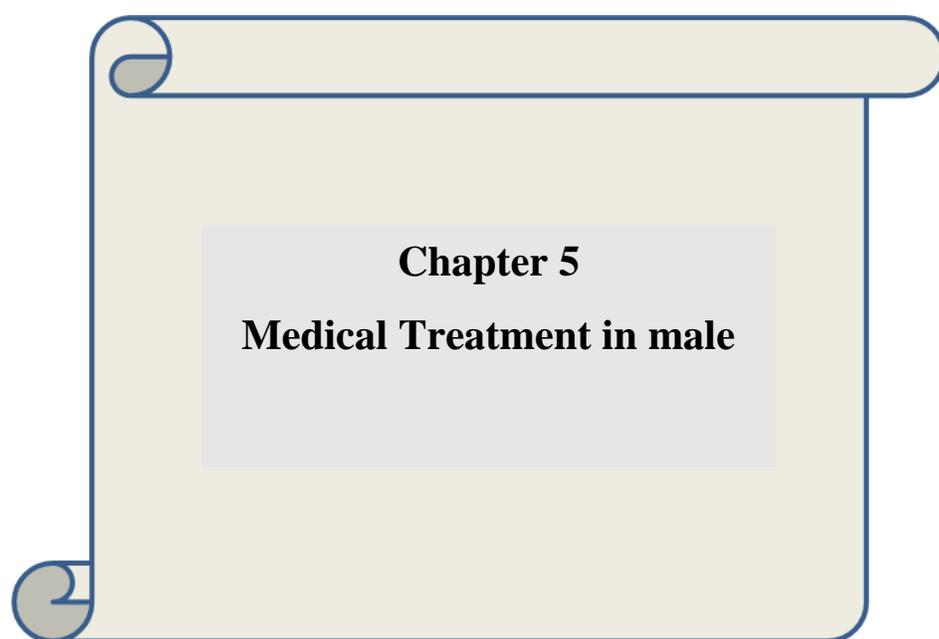
During metabolic stress, nutrient deficits, and starvation-like situations, autophagy has been found to play a role in supplying nutrients. To compensate for deficits in amino acids, minerals, and nutrients, cells engage in a process called autophagy, which entails the partial degradation of internal proteins and organelles. Apoptosis prevention is the goal here. When cells undergo autophagy, metabolic processes, cell division, and growth are halted.

Autophagy provides a mechanistic explanation for telogen effluvium after stress, illness, high fever, surgery, interrupted or poor diet, and other conditions that disrupt the hair growth phase. By stopping hair growth, autophagy helps the body keep its nutritional levels in the blood where they should be. Nutrient deficiencies may not manifest themselves clinically if hair growth is suppressed to make up for the shortfall. The body has entered a compensated failure condition. As soon as we start giving the hair what it needs, new hair will start growing in. The data suggests that addressing dietary inadequacies can stop hair loss and stimulate new growth (Guimarães and Linden 2004)(Fraker 2005). Possible mechanisms including autophagy and improper dietary balance play a part in the development of alopecia among crash diets (Goette and Odom 1976). Lack of zinc has been linked to hair thinning and loss (Ozturk et al. 2014). In order to prevent hair loss and promote new hair development, it is important to ensure that your body receives a balanced diet and that you avoid any nutritional deficiencies.



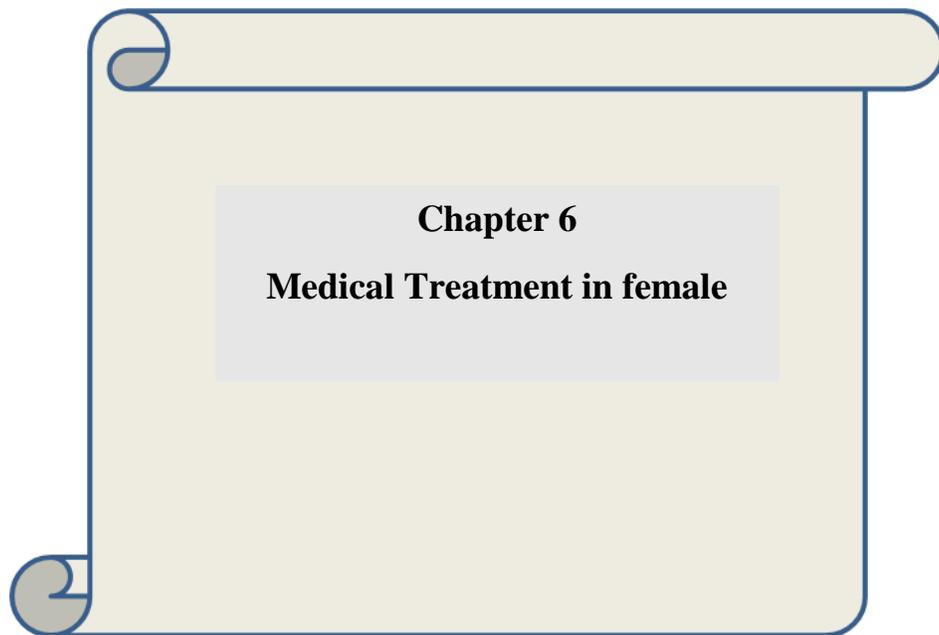
#### **4.1 Nutrition Correction in Hair Loss Management Gaining Attention**

Randomized, Double-Blind, Placebo-Controlled Study by Ablon G using shark cartilage and omega 3 showed decreased hair shedding in women (Le Floc'h et al. 2015). Positive effects of omega-3 and omega-6 fatty acids on female pattern hair loss (Page not found – Direct MS n.d.). Studies indicating the effective use of vitamin B6, calcium pantothenate, l-cystine, l-lysine, and combination treatments for hair loss have sparked a renewed focus on nutritional approaches to the problem ([Evaluation of vitamin B6 and calcium pantothenate effectiveness on hair growth from clinical and trichographic aspects for treatment of diffuse alopecia in women] n.d.)(Influence of nutritional supplementation in the treatment of telogen effluvium: Clinical assessment and digital phototrichogram in 60 patients n.d.). Benefits of nutritional supplements have been demonstrated in double-blind, placebo-controlled studies(Thom 2001)(Vegetarian eating patterns: science, values, and food choices--where do we go from here? | PlantBasedResearch n.d.). what part nutritional deficiencies without clinical symptoms play in hair loss without scarring. Vitamin and mineral deficits are extremely frequent. Reducing one's caloric intake is increasingly becoming a way of life (Misner 2022).



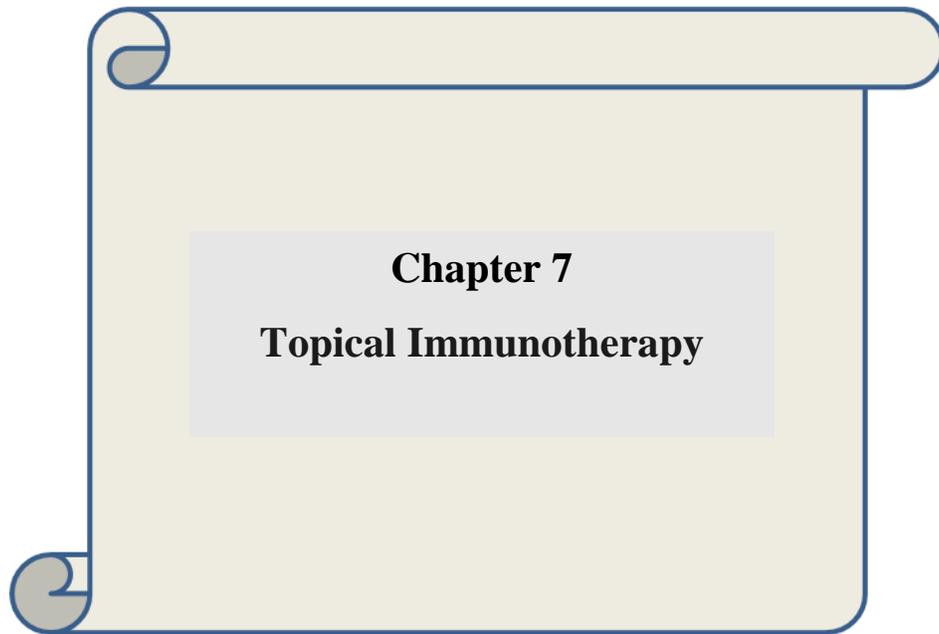
## 5.1 Medical Treatment in male

Minoxidil 5% scalp solution is recommended for adult males in the first stages of hair loss. Use it twice a day to your thinning hair if you want to keep what you have left. In some cases, it can stimulate the growth of new hair at the crown. It accomplishes its purpose by moderating the hair growth and shedding phases. In 30% of treated cases, vellus hair may develop into terminal hair (J Shapiro, clinics, and 1998 n.d.). It was found to stimulate hair growth in 33-66% of treated individuals. It prevents hair loss by inhibiting 5-alpha reductase, an enzyme found in the hair root that stimulates the production of male hormones in balding men (AL Aradi As et al. 2005). Minoxidil helps restore hair that has been damaged by a number of medical issues, including androgenetic alopecia. Regardless of the source, it lengthens the anagen phase and improves the size of small, underperforming follicles. Minoxidil, for instance, stimulates hair development in people with alopecia areata, congenital hypotrichosis, and loose anagen syndrome in addition to those with androgenetic alopecia. As hypertension was the initial target for the development of minoxidil, its mechanism of action is the most thoroughly studied and characterized. Vasodilator and an opener of potassium channels. Its mechanism of action in promoting hair growth is unknown, however it does not appear to include vasodilation (A. B.-T. J. of investigative dermatology and 1991 n.d.)(Buhl et al. n.d.)(Philpott et al. n.d.)(Kubilus et al. n.d.). The Food and Drug Administration (FDA) approved topical minoxidil (5%) for sale to the general public in 1997. In a 48-week study, twice-daily treatments with the 5 percent solution, the 2 percent solution, or a placebo were given to 393 men between the ages of 18 and 49 who had mild-to-moderate vertex thinning. Hair counts were 45 percent higher in the 5 percent solution group (157 men) than in the 2 percent solution group (158 men), and were nearly five times higher than those in the placebo group (78 men) (16 CUTIS ® Pediatric Dermatology n.d.). Although research on the combination of minoxidil and finasteride in humans is lacking, it was found to be more effective than either treatment alone in a study with stump-tail macaques (Diani et al. n.d.). Topical minoxidil primarily causes dermatological side effects. Around 7% of patients using the 2% solution experience irritation of the scalp, including dryness, scaling, itching, and redness; this number increases to about 20% using the 5% solution due to its greater propylene glycol content. Contact dermatitis and photosensitivity have been linked to minoxidil and the prepared solution (Wilson et al. n.d.)(Alomar and Smandia 1988).



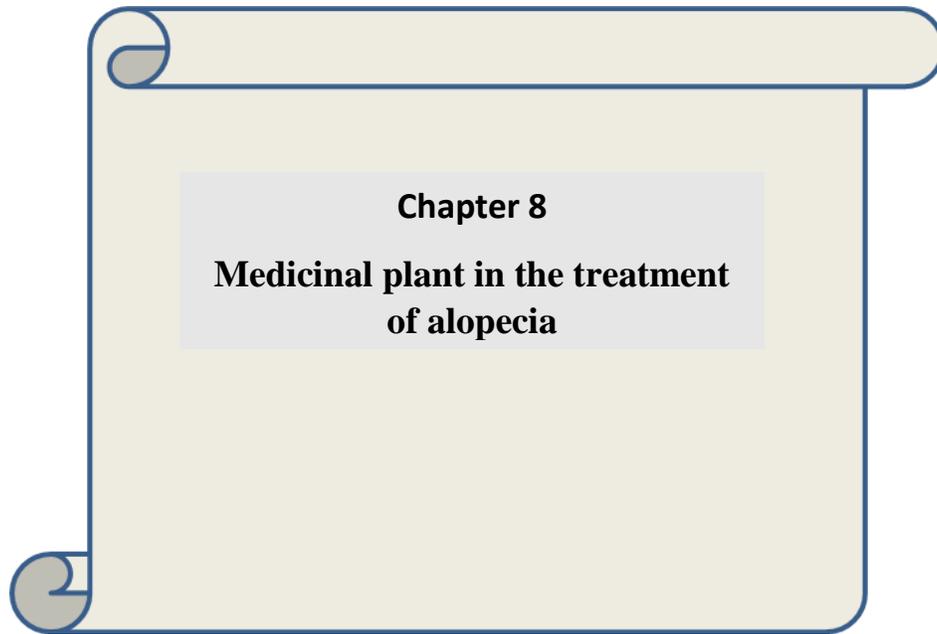
## 6.1 Medical Treatment in female

Serum androgen levels, menstrual cycles, and pregnancies are typically normal in women with androgenetic alopecia. An in-depth analysis of hormone levels is usually unnecessary in the absence of additional symptoms and indicators of androgen excess (Drake et al. n.d.). Androgenetic alopecia affects both sexes, however the loss of hair has a more profound emotional impact on women (Cash et al. n.d.). For women with androgenetic alopecia, the only treatment option is a topical minoxidil solution to stimulate hair growth. In 1991, following results from two double-blind, placebo-controlled, 32-week studies involving 550 women aged 18-45, the FDA approved a 2 percent solution of minoxidil for this purpose (DeViliez et al. n.d.). Minoxidil has the same serious side effects in women as it does in men, with the exception that hypertrichosis is more common in women. Although exact data are available, it is estimated that 3-5% of women who use a 2% solution of minoxidil will develop hypertrichosis, with the number increasing for those who use a 5% solution. It usually appears on the forehead, but can also show up in the middle of the face, on the sides of the cheeks, and even on the upper lip and chin (treatment and 1994 n.d.). One year of daily administration of 1 mg of finasteride or a placebo to 136 postmenopausal women with androgenetic alopecia resulted in hair loss in both groups; there was no discernible difference in hair loss between the finasteride and placebo groups (Roberts J, Hordinsky MK, Olsen EA, et al. The effects... - Google Scholar n.d.). Finasteride should not be taken by pregnant or potentially pregnant women since 5-reductase inhibitors have been linked to genital malformations in male babies. Men with a 5-reductase deficit are a high-risk population, so this should be avoided (Wood and Rittmaster 1994). It is unclear whether or not estrogen plays a role in hair development in humans. Although no randomized controlled trials exist, oral and topical estrogen have been utilized in women with androgenetic alopecia. In my own practice, I no longer recommend estrogen for women with androgenetic alopecia because topical minoxidil solution appears to be more helpful in increasing scalp coverage and preventing additional hair loss. Nevertheless, aromatase activity in hair follicles is much higher in women with androgenetic alopecia, especially in the frontal and occipital regions of the scalp. Women may exhibit a less severe form of this feature because of their higher exercise levels (Sawaya, Dermatology, and 1997 n.d.). Spironolactone reduces testosterone production and acts as a modest competitive inhibitor of androgen binding to its receptor. It shows promise as a hirsutism therapy (Lobo et al. n.d.).



## 7.1 Topical Immunotherapy

When it comes to treating chronic alopecia areata that affects more than half of the scalp, topical immunotherapy (contact sensitization) is one of the more promising options (clinics and 1993 n.d.). It's still in the experimental stages, therefore it's only available in a limited number of U.S. clinics right now. A powerful contact allergen is first applied to the scalp to sensitize the patient, and then the same substance is applied to the patient's skin once a week to elicit allergic contact dermatitis. Diphenylcyclopropanone (also known as diphenylprone) and squaric acid dibutyl ester are two of the allergens employed (J Shapiro, clinics, and 1998 n.d.). The combination of mild irritation, redness, and scaling is sufficient to stimulate hair growth. Topical immunotherapy's effectiveness has been demonstrated in experiments in which just half of the scalp was treated and the other half acted as a control (R. H.-T. J. of investigative dermatology and 1991 n.d.). The preferred technique is unilateral application of the allergen; once growth has developed on one side (in 3–12 months), the other half of the scalp is treated as well (clinics and 1993 n.d.). Yet, it is possible that contact sensitization prevents alopecia areata by preventing the release of proinflammatory cytokines or by generating nonspecific suppressor T cells. Patients who have lost between 50 and 99 percent of their scalp hair see aesthetically acceptable hair growth in 40 to 60 percent of cases (Hoffmann, clinics, and 1996 n.d.). Just around 25% of people who have experienced total loss experience aesthetically acceptable growth. Topical immunotherapy has been used on children as young as seven years old in Europe (Orecchia, Malagoli, and Santagostino 1994).



**Chapter 8**  
**Medicinal plant in the treatment**  
**of alopecia**

## 8.1 Medicinal plant in the treatment of alopecia

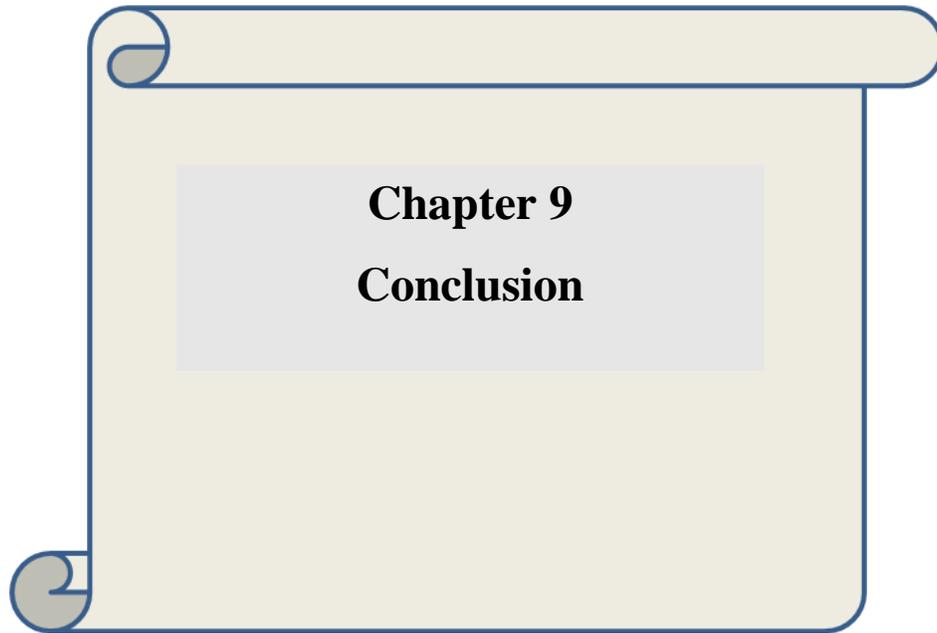
Traditional remedies for localized baldness have included applying garlic to the affected areas (Hajheydari et al. n.d.). *Allium sativum*, more often known as garlic, is a perennial plant that has been used for medical purposes for millennia. Several components in garlic have been linked to health benefits, including a lower risk of cardiovascular disease, the ability to fight cancer and infection, and a lower blood sugar level (Bayan et al. n.d.). In terms of skin and hair disease processes in particular, the precise mechanism and long-term benefit are not yet recognized. A 55 percent increase in capillary skin perfusion was seen in healthy participants in a single double-blind, randomized control study. Therapeutic effects on hair growth may be explained by an increase in blood flow to the scalp, which may be the result of vasodilation of precapillary arterioles. The use of garlic gel significantly increased the therapeutic efficacy of topical betamethasone valerate beginning in the second month of application, as compared to in the control group, in a randomized, double-blind, controlled clinical trial of its efficacy in patients with alopecia areata (Jung et al. n.d.)(Pazyar, reports, and 2011 n.d.).

Olives are a common tree crop in the Mediterranean region, and olive oil is the liquid fat extracted from the olives (United States Standards for Grades of Olive Oil and Olive-Pomace Oil 2010). Olives are pressed whole to get the oil. Even though there are no randomized controlled trials proving olive oil's effectiveness in treating hair loss, one case report did show significant improvements in psoriatic alopecia when olive oil was added to other treatments. Applying 0.25 percent dexamethasone lotion twice a day, together with tar shampoo and olive oil before each wash, significantly decreased scaling and stabilized hair loss. Three months following therapy, 75% of hair regrew, and at a year's follow-up, there was no recurrence in the research participants (Iamsung, ..., and 2017 2017). Rosemary oil's (*Rosmarinus officinalis* L.) potential benefits on hair loss and growth stem, at least in part, from the plant's ability to increase microcapillary perfusion. Prostaglandin E2 production was found to be elevated, whereas leukotriene B4 production was decreased, in human polymorphonuclear leukocytes. Additionally, it suppresses the complement system (Al-Sereiti: Pharmacology of rosemary (*Rosmarinus*... - Google Scholar n.d.). The therapeutic efficacy of rosemary oil in the treatment of AGA was studied using a randomized, single-blind clinical study, and results were compared to those of minoxidil 2% ointment. Applying rosemary oil had the same benefit as using minoxidil 2% ointment, the study found. Furthermore, the rosemary group had higher treatment adherence than the minoxidil group. The results of the study showed that rosemary oil is effective as a complementary therapy for AGA (Panahi et al. n.d.).

*Psidium guajava* and its polyherbal formulation for chemotherapy-induced alopecia: a possible treatment. Mice were given 300 milligrams per kilogram of *Psidium guajava* hydroalcoholic extract to see if it stimulated hair growth. Toxic group alkaline phosphatase levels were lower than the control group's 93.66U/L. Chemotherapy-induced alopecia mice treated with *Psidium guajava* extract at 300mg/kg orally and 5% solution topically saw increases in Alkaline phosphatase and hair density (Gavatia et al. 2011). *Eclipta alba* (butterfly weed) methanol extracts were tested for

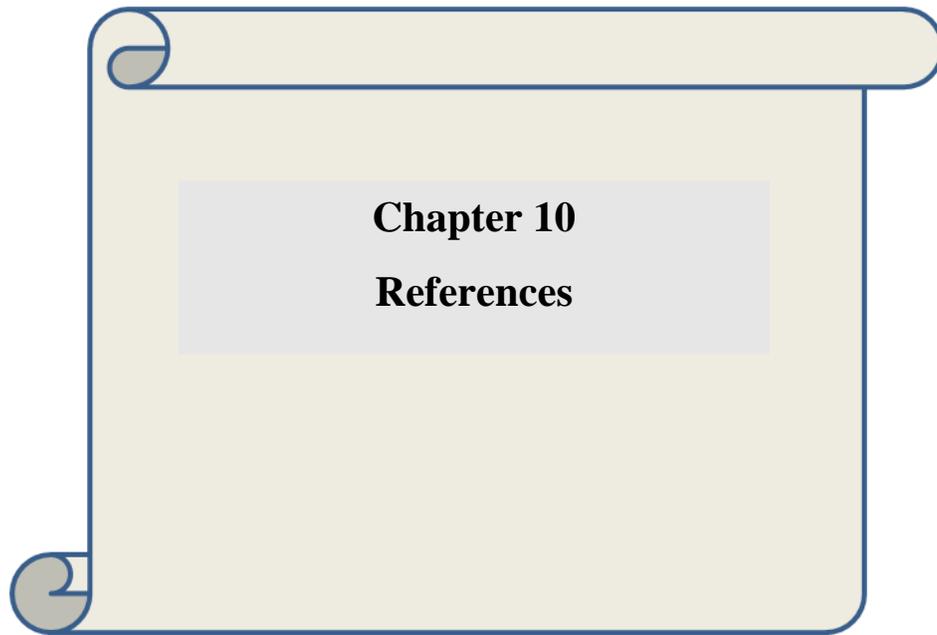
their ability to stimulate hair growth in C57/BL6 mice. Mice were treated with 3.2 mg/15cm<sup>2</sup> of *Eclipta alba* methanolic extract and 1.6 mg/15cm<sup>2</sup> of the extract, and the results were compared to those of the standard drug minoxidil. Both concentrations of extract show dose-dependent enhancements in hair growth. Like minoxidil, 3.2 mg/15cm<sup>2</sup> caused a similar percentage increase in hair growth (A. S. Pundkar et al. 2020). The catechin epigallocatechin gallate and other catechins, flavonoids, a caffeic acid derivative, volatile oil, and flavonoids are abundant in green tea. Isolation of epigallocatechin gallate from *Camellia sinensis* leaves and examination of its effects on human dermal papilla cells in vivo and in vitro. In vitro studies with Epigallocatechin gallate shown promising results, with the compound increasing hair growth (L. Z. Lin, Chen, and Harnly 2008). The effects of a hair formulation containing *Emblca officinalis*, *Bacopa monnieri*, *Trigonella foneumgraecum*, and *Murraya Koenigii* on hair development were studied. The effectiveness of oil for stimulating hair growth was evaluated at concentrations ranging from 1 to 10% using three distinct methods. The results demonstrated a dose-dependent activity in hair growth. An effective solution for stimulating hair growth was discovered to be ready using the cloth pouch decoction technique (K and chander semwal Asst Professor 2011). Researchers used an in vivo technique to examine the effects of *Zizyphus jujube* seed oil on hair development. Over the course of 21 days, mice with their fur shaved were treated with varying concentrations of essential oil.

Mouse hair length, hair thickness, and hair follicle density were significantly improved 21 days after treatment with varying concentrations of *Zizyphus jujube* essential oil (Yoon, Al-Reza, and Kang 2010). The leaf of *Primula obconica* has been studied by Rhodes et al. for its potential to stimulate hair growth in humans. Patients were first sensitized to *Primula obconica* by wearing a leaf, then administered corticosteroids or *Primula obconica*; after a month of treatment, the latter was shown to be significantly more effective than the former (A. Pundkar et al. 2020). Azelaic acid is a dicarboxylic acid found in cereal crops like wheat and barley; it is produced by the fungus *Pityrosporum ovale*. In the existing body of research on patchy androgenetic alopecia (AGA), azelaic acid was compared to anthralin as a positive control in a single randomized controlled study. Hypertrichosis of the hair follicle and irritating contact dermatitis are hypothesized to be involved in the mechanism of action. It appears that azelaic acid restores proper keratinization of skin and hair cells through influencing the cornification process of epidermal cells. By inhibiting 5-reductase, azelaic acid also appears to have antiandrogenic effects. Both azelaic acid and anthralin were found to be effective in the treatment of localized AGA, according to the pilot trial. The therapeutic effects of azelaic acid were studied in only one study, and it was not a placebo-controlled trial, therefore the evidence is weak (Ezekwe, King, and Hollinger 2020).



## 9.1 Conclusion

The state of human hair has been a topic of intense interest for centuries. Due of stress, environmental factors, and other factors, alopecia is a common problem in urban areas. Today's available allopathic medications for hair loss come with their fair share of unwanted side effects, but thankfully there are alternatives. Every study of medicine begins with the study of herbs. Compared to synthetic pharmaceuticals, herbal medicines have fewer negative effects and are recommended by roughly 80% of the public. It is possible that the hair loss problem can be permanently solved if scientists are able to isolate another helpful chemical of natural origin. Synthetic herbal remedies are preferable, hence their usage is strongly encouraged. "This review article has helped us to get the following conclusion: there are numerous effective herbal medications for healing alopecia, and none of them have any negative side effects. Herbal extracts rich in numerous phytoconstituents can be used to treat alopecia in a variety of ways, including as dietary supplements and inhibitors of the hormones dihydrotestosterone (DHT) and 5-alpha reductase (5-AR). Alopecia can be treated with aromatherapy to increase blood flow to the scalp, and there are a select few natural treasures that contain these volatile oil active ingredients. Application of garlic to the afflicted areas has been one of the traditional treatments for localized baldness. The following categories apply to the natural plants used in hair-care products:(I) Hair-chemical plants; (ii) ill employees at hair-coloring facilities Plants (III) used to stop dandruff and (I4) used to enhance the condition and promote the growth of hair. Topical immunotherapy (contact sensitization), one of the more effective treatments for chronic alopecia areata that covers more than half of the scalp, is one of the most promising approaches. SNPs at various chromosomal locations have been linked to the onset of androgenetic alopecia, according to candidate gene and genome-wide association analyses. In a polygenic manner, a number of genes determine the propensity for androgenetic alopecia. Before the precise genetic causes of this polygenic illness can be fully described, however, more research is required. As we can see, there is some, albeit little, literature on various psychological concerns in alopecia areata. In order to manage this disease, it is vital to encourage more psychology-related research and psychological interventions. Studies that focus on treatment are lacking, and from the standpoint of mental health, there is a need for greater documentation of management practices. The need for dermatologists to collaborate with mental health specialists in the long-term and comprehensive management of this challenging and complicated condition is expanding. In general, both cicatricial and noncicatricial alopecias can be diagnosed using a variety of helpful evaluation techniques. To name a few, these include hair counts, microscopic analysis, trichoscopy, and scalp biopsies. Several different treatments are available after diagnosis. Promising novel therapy approaches are also being examined, such as those that focus on peroxisome proliferator-activated receptor pathways to treat lichen planopilaris or hair follicle stem cells to treat androgenetic alopecia. Future advancements will make it easier for clinicians to successfully treat both cicatricial and noncicatricial alopecias.



**Chapter 10**  
**References**

## 10.1 Reference

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