

A comprehensive review on the Samprapti and management of Khalitya w.s.r. to Alopecia

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Khalitya, recognized in Ayurveda as a form of hair loss, bears significant resemblance to Alopecia as understood in modern dermatology. It is primarily caused by the vitiation of Pitta and Vata Doshas, although the involvement of Kapha and Rakta also contributes to the pathology. This vitiation leads to the weakening of hair follicles, impaired scalp nourishment, and eventual hair fall and thinning. According to Ayurvedic principles, the Samprapti (pathogenesis) of Khalitya involves the progressive disturbance of the Doshas, impacting key bodily tissues such as Rakta (blood), Mamsa (muscle), and Asthi (bone), culminating in follicular degeneration. The Samprapti in Khalitya outlines a systematic progression of Doshic disturbances that directly impact the structural and nutritional integrity of the scalp and hair roots. This review aims to explore the Ayurvedic understanding of Khalitya through its etiology (Nidana), classification, and Samprapti, while drawing correlations with the contemporary pathophysiology of different types of Alopecia, such as Androgenetic Alopecia, Alopecia Areata, and Telogen Effluvium. Modern research highlights autoimmune responses, genetic predisposition, hormonal imbalances, and environmental triggers as major causes of Alopecia, which interestingly align with Ayurvedic principles of internal disharmony and impaired tissue metabolism. By analyzing these interconnected perspectives, this study underscores the potential of an integrative treatment strategy. Ayurvedic interventions like Shodhana (purificatory therapies), Shamana (palliative therapies), Rasayana (rejuvenation), and herbal formulations can be combined with modern treatments such as minoxidil, corticosteroids, and platelet-rich plasma (PRP) therapy. Understanding the pathogenesis of Khalitya offers a holistic approach that may enhance therapeutic outcomes and provide personalized, root-cause-oriented solutions for effective long-term hair loss management.

Keywords: Khalitya, Hair fall, Alopecia, Ahara, Vihara, Samprapti

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Introduction

Hair loss is a common concern affecting individuals worldwide, both cosmetically and medically. In *Ayurveda*, Acharya Sushruta classified it under *Kshudraroga* and referred to it as *Khalitya*, also known as *Indralupta* or *Ruhya*.^[1] Acharya Charaka described it under *Trimarmiya chikitsa Adhyaya*^[2] and Acharya Vagbhatta classified it under *Shiroroga*^[3], including its causative factors, pathogenesis, and management. In modern science, it is considered as Alopecia.

Methodology

The methodology for understanding the *Samprapti* of *Khalitya* concerning Alopecia follows a comprehensive literature review of *Ayurvedic* texts (*Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*) and modern dermatological research on Alopecia. A comparative analysis is conducted to correlate the *Samprapti* (pathogenesis) of *Khalitya* with contemporary concepts, focusing on the involvement of *Doshas*, *Dhatus*, and *Srotas*. Relevant *Ayurvedic* treatments, including herbal formulations, *Panchakarma*, and lifestyle modifications, are compiled alongside contemporary therapeutic approaches. Finally, findings are interpreted to propose an integrative management strategy for *Khalitya*, emphasizing *Samprapti Vighatana* (breaking the pathogenesis).

Classification of Khalitya

Ayurveda describes four types of *Khalitya*, based on the predominant *Dosha* involved:

- 1. Vataja Khalitya** - Dryness, roughness, and thin hair.
- 2. Pittaja Khalitya** - Redness, burning sensation, and yellow discoloration.
- 3. Kaphaja Khalitya** - Oily scalp, itching, and heaviness.
- 4. Sannipataja Khalitya** - Mixed symptoms due to all three *Doshas*.

Modern Correlation: Alopecia

In modern medicine, Alopecia is a general term for hair loss from the scalp or other parts of the body. It includes conditions like:

- **Alopecia Areata** - Autoimmune patchy hair loss.

- **Androgenetic Alopecia** - Hormone-related hereditary hair loss (male/female pattern baldness).
- **Telogen Effluvium** - Hair shedding due to stress, illness, or hormonal changes.

This article reviews the *Samprapti* of *Khalitya* and draws parallels with the pathophysiology of alopecia.

Concept of Khalitya in Ayurveda

Definition

Khalitya is a condition characterized by the gradual loss of hair from the scalp due to the vitiation of *Tridosha* (*Vata*, *Pitta*, *Kapha*) and *Rakta Dhātu* (blood tissue). *Ayurvedic* texts attribute the primary *Doshic* imbalance to *Pitta*, which is aggravated by specific *Nidana* (causative factors).

Nidana (Causative Factors)

The key etiological factors described for *Khalitya* include:

- Dietary factors: Excessive consumption of *Pitta*-provoking foods such as spicy, oily, alkali, salty and fermented items.^[4]
- Lifestyle factors: Stress, inadequate sleep, neglecting oil massage of hairs^[5], improper hair wash or poor hygiene and excessive exposure to heat or sunlight.
- Environmental factors: Pollution and seasonal changes.
- Genetic predisposition: Mentioned indirectly through *Prakriti* (constitution).^[6]

Samprapti (Pathogenesis) of Khalitya

The pathogenesis of *Khalitya* involves the interplay of the *Tridosha* and *Dhatus* (body tissues):

1. Dosha Vitiation:

- Excessive *Pitta*, often accompanied by *Vata* and *Kapha*, leads to *Rakta Dusti* (vitiation of blood tissue). *Pitta's Tikshna* (sharp) and *Ushna* (hot) properties disturb the hair follicles, causing hair fall.
- Vitiating *Pitta* along with vitiating *Vata* when reached to hair roots, it leads to weakening of hairs from hair roots which leads to hair fall and at that time vitiation of *Rakta* and *Kapha Dosha* block the opening of hair follicle, which prevent growth of new hairs which leads to baldness.^[19]

2. Srotas (Channels):

- The hair follicles are considered the terminal parts of *Romakoopa Srotas*. Vitiating *Doshas* obstruct the nourishment of these *Srotas*, leading to hair loss.
- While *Raktavaha* and *Asthivaha Srotas* play primary roles in *Khalitya*, *Swedavaha* and *Majjavaha Srotas* also contribute by affecting scalp health, detoxification, and nervous regulation.

3. Dhatwagni (Tissue Metabolism):

- Impaired *Dhatwagni* causes improper formation of subsequent *Dhatus*, resulting in weaker hair roots and follicles.

4. Stages of Khalitya:

- *Sanchaya* (Accumulation): *Doshas* begin to accumulate in the scalp region.
- *Prakopa* (Aggravation): *Doshas* aggravate and start affecting the *Romakoopas*.
- *Prasara* (Spread): Vitiating *doshas* spread to the *Rakta Dhatu*.
- *Sthanasamshraya* (Localization): *Doshas* localize in the hair follicles, weakening their base.
- *Vyakti* (Manifestation): Visible hair fall occurs.
- *Bheda* (Complication): Chronic cases result in bald patches or complete hair loss.

Correlation with Alopecia in Modern Medicine[7]

Alopecia is a medical condition characterized by partial or complete hair loss, often categorized as:

1. Androgenetic Alopecia: Genetic predisposition combined with hormonal imbalances.
2. Alopecia Areata: An autoimmune condition causing patchy hair loss.
3. Telogen Effluvium: Hair loss due to stress or systemic illnesses.
4. Traction Alopecia: Hair loss from repeated tension on the hair.

Modern pathophysiology attributes hair loss to factors such as:[8]

- Hormonal imbalances (e.g., dihydrotestosterone in androgenetic alopecia).
- Immune system dysfunction in alopecia areata.
- Impaired blood supply to hair follicles.

Additional Factors Contributing to Hair Loss:**1. Nutritional Deficiencies:**

- Lack of essential vitamins and minerals like iron, zinc, biotin, and vitamin D can weaken hair follicles and cause excessive shedding.

2. Oxidative Stress & Inflammation:

- Excessive free radicals and inflammation damage hair follicles, accelerating hair loss.
- Chronic scalp inflammation is seen in conditions like seborrheic dermatitis and psoriasis, which can contribute to hair thinning.

3. Genetic Factors:

- Family history plays a significant role, especially in Androgenetic Alopecia, where genetic sensitivity to dihydrotestosterone (DHT) leads to follicular miniaturization.

4. Endocrine Disorders:

- Conditions like hypothyroidism, hyperthyroidism, polycystic ovarian syndrome (PCOS), and adrenal dysfunction can disrupt hair growth cycles.

5. Medication-Induced Hair Loss:

- Certain drugs, including chemotherapy, antidepressants, beta-blockers, and retinoids, can trigger hair shedding (drug-induced alopecia).

6. Scalp Infections & Disorders:

- Fungal infections (Tinea Capitis) and bacterial conditions can damage hair follicles and cause localized or diffuse hair loss.

7. Environmental & Lifestyle Factors:

- Pollution, excessive UV exposure, harsh hair treatments (chemical dyes, heat styling, and tight hairstyles), and smoking contribute to hair weakening and shedding.

8. Psychological Factors:

- Chronic stress and anxiety can lead to hair loss via Telogen Effluvium, where hair prematurely enters the shedding phase due to excessive cortisol production.

These factors, when correlated with *Ayurvedic* concepts of *Dosha* imbalance and *Srotas* dysfunction, emphasizing *Pitta* vitiation and *Rakta Dushti* as key players in the manifestation of *Khalitya* (Alopecia) and guide integrative treatment approaches.

Management of *Khalitya* through *Ayurveda*

1. *Shodhana* (Detoxification)

- *Virechana* (Purgation) - To eliminate aggravated *Pitta*.
- *Raktamokshana* (Bloodletting)[9] - Useful in cases of severe *Rakta Dushti*.
- *Prachana Karma* (Bloodletting Therapy)[9] - As described by *Sushruta*, this procedure is useful for removing vitiated *Pitta* and *Rakta* in the scalp region, especially in inflammatory conditions. It helps in purifying blood circulation and rejuvenating hair follicles.
- *Basti* (Medicated Enema Therapy) - Indicated in *Vata-Pitta* predominant *Khalitya*, particularly in chronic cases where hair loss is associated with systemic dryness and *Asthi Dhatu Tikta Ksheera Basti* (medicated milk enema with bitter herbs) is useful.
- *Takra Dhara* (Buttermilk Pouring Therapy) - Effective in *Pitta-Vata* aggravated conditions, where excessive heat and dryness cause hair loss. Buttermilk infused with cooling herbs like *Amalaki* and *Musta* is poured on the scalp for nourishment.

2. *Shamana* (Pacification)

- Internal medications - *Amalaki*, *Bhringraj*, and *Brahmi* for *Pitta*
- *Lepa* (Herbal Pastes) - Application of herbal pastes like *Bhringraj Lepa*, *Gunja Lepa*, or *Jatamansi Lepa* directly on the scalp for improved follicular health and *Pitta-Vata*
- *Shiro Abhyanga* (Head Massage)/ External applications[5] - Regular use of medicated oils like *Karanja Taila*, *Gunja Taila*, *Kumari Taila*, *Bhringraj taila* and *Neelibhringadi taila* helps in stimulating hair follicles and preventing excessive hair loss.
- *Shirodhara* (Continuous Oil Pouring Therapy) - Beneficial in stress-induced Telogen Effluvium and Alopecia Areata. Medicated oils like *Bhringraj Taila*[20], *Brahmi Taila*, and *Ksheerabala Taila* help in nervous system relaxation and follicular nourishment.

3. Dietary and Lifestyle Modifications

- *Dincharya* (Daily Regimen) - Avoiding late-night sleep (*Ratri Jagarana*), excessive sun exposure, and consumption of hot, spicy,

- and fried foods that aggravate *Pitta* and *Rakta Dushti* and incorporate a balanced diet rich in proteins and antioxidants.
- Hair Washing (*Kesha Prakshalana*) - Washing hair with decoctions of *Shikakai*, *Yasthimadhu*, and *Triphala* instead of chemical-based shampoos. Reduces scalp irritation, dandruff, and itching, promoting follicular health.
- Stress management through *Yoga* and meditation.
- Copper Water Therapy - Drinking water stored in a copper vessel helps in balancing *Pitta* and improving scalp health.

4. *Rasayana* (Rejuvenation) and *Vajikarana* Therapies

- *Medhya Rasayana* (Nervine Tonics) - *Brahmi*, *Mandukaparni*, and *Guduchi* improve scalp circulation and reduce stress-induced hair loss.
- *Vajikarana Rasayana* - Some aphrodisiac and revitalizing herbs like *Kapikacchu* and *Gokshura* are used to strengthen hair roots.
- Herbs like *Ashwagandha* and *Shatavari* for improving hair health.

5. Specific Treatments

- *Keshya Dravyas* - Herbs promoting hair growth like *Bhringraj*, *Amalaki*, *Brahmi*, *Yasthimadhu*, *Jatamansi*, *Neem*, etc.
- *Nasya Karma*[10] - Nasal administration of medicated oils for better nourishment-like *Anu Taila*, *Bhringraj Taila*, *Ksheerabala Taila*, *Shadbindu Taila*, etc can be used.
- *Jalaukavacharana* (Leech Therapy) - Used in severe *Raktaja Khalitya*, where blood impurities cause inflammation and hair fall. It improves scalp circulation and detoxifies follicles.
- *Dhupana* (Herbal Fumigation Therapy)[11] - Using *Nimba* (Neem), *Haridra* (Turmeric), and *Guggulu* fumigation for preventing infections and strengthening hair roots.
- *Shiro Pichu* (Oil-Soaked Cotton Therapy)[12] - Cotton soaked in medicated oils like *Neeli-bhringadi Taila* is placed on scalp to promote deep absorption & follicular nourishment.

Modern Management for Alopecia

The modern treatment of Alopecia depends on its type and underlying cause.

It includes pharmacological, procedural, and lifestyle-based approaches to slow hair loss and promote regrowth.

1. Pharmacological Treatments[13]

Minoxidil (Topical Solution/Foam, 2% or 5%) [13,14]

- A vasodilator that increases blood flow to hair follicles.
- Used for Androgenetic Alopecia and Telogen Effluvium.
- Requires long-term use; discontinuation may lead to hair loss recurrence.

Finasteride (Oral, 1 mg daily)[13,14]

- A 5-alpha reductase inhibitor that prevents the conversion of testosterone to dihydrotestosterone (DHT).
- Effective in male pattern baldness but not recommended for women of childbearing age.

Dutasteride (More potent than Finasteride) [13,14,17]

- Used in severe Androgenetic Alopecia, blocks both Type I & II 5-alpha reductase enzymes.

Corticosteroids (Oral, Topical, or Injections) [13,14]

- Used for Alopecia Areata to suppress the autoimmune response.
- Intralesional injections (Triamcinolone) are common for patchy hair loss.

JAK Inhibitors (Janus Kinase Inhibitors)[13,18]

- Newer drugs like Tofacitinib and Ruxolitinib are used in severe Alopecia Areata.
- Help regulate immune response but have potential side effects.

Anti-androgen Therapy (For Female Pattern Hair Loss)[15]

- Spironolactone and Oral Contraceptive Pills (OCPs) reduce androgen effects on hair follicles.

Biotin, Iron, and Vitamin Supplements[8]

- Essential for hair growth, especially in nutritional deficiency-induced hair loss.

2. Procedural Treatments:[16]

Platelet-Rich Plasma (PRP) Therapy[16,18]

- Blood-derived growth factors injected into the scalp to stimulate follicles.

- Effective in Androgenetic Alopecia & Telogen Effluvium.

Hair Transplant Surgery

- Follicular Unit Extraction (FUE) and Follicular Unit Transplantation (FUT) methods are used.
- Suitable for male pattern baldness and irreversible hair loss cases.

Low-Level Laser Therapy (LLLT)

- Uses red light to stimulate hair follicles and increase growth.
- FDA-approved for Androgenetic Alopecia.

Microneedling (Dermaroller Therapy)

- Creates tiny scalp injuries to boost collagen and hair growth.
- Often combined with Minoxidil or PRP therapy for better results.

3. Lifestyle and Supportive Management:

- Avoid excessive heat styling, harsh chemicals, and tight hairstyles (Traction Alopecia).
- Balanced diet rich in protein, iron, zinc, and omega-3 fatty acids.
- Stress management through meditation, yoga, and proper sleep.
- Use mild, sulphate-free shampoos and scalp serums for nourishment.

Discussion

The review article provides a comprehensive understanding of *Khalitya* through the lens of *Ayurvedic* pathogenesis (*Samprapti*) and management, correlating it effectively with various forms of Alopecia recognized in modern dermatology. The discussion highlights that *Khalitya* is primarily a *Pitta*-dominant *Tridoshaja* disorder, where the combined vitiation of *Vata*, *Pitta*, *Kapha*, and *Rakta* leads to the degeneration and obstruction of hair follicles. This *Ayurvedic* explanation mirrors modern etiological factors such as hormonal imbalances, autoimmune conditions, and stress-induced hair loss. Notably, the role of *Rakta Dhatu Dushti* in *Pittaja Khalitya* aligns with the inflammatory mechanisms observed in Alopecia Areata. The article emphasizes the importance of early diagnosis and identification of the dominant dosha to arrest the progression of hair loss and prevent follicular damage.

It also sheds light on preventive aspects rooted in *Ayurvedic* lifestyle practices such as *Dinacharya* (daily regimen), *Ritucharya* (seasonal regimen), and *Sadvritta* (ethical code of conduct) which contribute significantly to maintenance of scalp health and prevention of recurrence. Moreover, article acknowledges impact of psychosomatic factors on hair loss and advocates for a holistic approach incorporating yoga, meditation, and stress management. It outlines both *Shodhana* (bio-purification) and *Shamana* (palliative) therapies, including:

- **Virechana** for *Pitta* elimination
- **Nasya karma** for local nourishment
- Use of **medicated oils** (like *Bhringraj*, *Neeli*)
- Internal medications like **Amalaki**, **Bhringraj**, and **Brahmi**
- **Rasayana therapy** to rejuvenate and strengthen hair roots

The review also highlights the role of diet, lifestyle, stress management, and seasonal regimens (*Ritucharya*) in preventing reoccurrence. The discussion concludes by acknowledging the scope for further research and clinical trials to validate *Ayurvedic* treatments scientifically, enhance their acceptance, and potentially integrate them with modern dermatological practices.

Conclusion

The *Ayurvedic* understanding of *Khalitya* (hair loss) and its *Samprapti* (pathogenesis) provides a comprehensive and individualized framework for addressing hair loss by focusing on the balance of *Doshas* (bodily humors), nourishment of *Dhatus* (tissues), and purification of *Srotas* (bodily channels). According to *Ayurveda*, the root cause of hair loss lies in the vitiation of *Pitta dosha*, often aggravated by poor diet, stress, hormonal imbalances, and environmental factors, leading to the weakening of hair-supporting tissues and obstruction in nutrient flow. This nuanced understanding aligns with the modern concept of alopecia, which identifies multifactorial causes including genetics, hormonal changes, autoimmune conditions, and nutritional deficiencies. While contemporary treatments such as Minoxidil, Finasteride, Platelet-Rich Plasma (PRP) therapy, and hair transplantation provide targeted and often effective results, they may not address underlying systemic imbalances or prevent recurrence.

Ayurveda, through its therapies like *Shodhana* (detoxification), *Shamana* (pacification), *Rasayana* (rejuvenation), and holistic lifestyle interventions, offers a root-cause-based and sustainable approach. A multimodal integrative strategy—merging *Ayurvedic* and modern medical paradigms—has the potential to offer superior outcomes by treating both symptoms and systemic causes of hair loss.

However, for broader clinical acceptance and integration into mainstream healthcare, rigorous scientific research, well-designed clinical trials, and standardization of *Ayurvedic* protocols are imperative.

Collaborative research between *Ayurvedic* practitioners and modern dermatologists can bridge traditional wisdom with contemporary science, paving the way for a holistic, evidence-based model of hair loss management that caters to both preventative and curative aspects of *Khalitya/Alopecia*.

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