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## Critical Analysis and Treatment Protocol for Management of Childhood Premature Graying Hair (Canities) w.s.r. to *Palitya*

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### ABSTRACT

Hair is important skin appendage which has vital role to play in perspiration and temperature maintenance, but equally important cosmetically. Once own appearance as well as psychological make-up is definitely highlighted by certain external factors like skin complexion, texture and pigmentation of the hair.

As we know Hyper and hypo pigmentation of the skin and hairs is a genetically determined entity and shows wide range of variation in its presentation. The biological process of gray hair appears to be associated with the progressive loss of pigment producing cells. Hair is said to gray prematurely when it occurs before the age of 20 in whites, 25 in Asians and 30 in Africans. Canities or premature graying of the hairs in childhood clinical practice is significantly increasing in recent days which can be attributed to significant changes in life style, dietary habits and environmental pollution. Ultraviolet light, smoking, water pollution with increased fluoride contents, drugs, trace elements, nutritional deficiencies and increase in academic stress are certain other causes.

In Ayurvedic literature also we come across a disorder by name, *Palitya* which is confined to scalp hairs and caused by certain external (*Agantuka*) and internal (*Doshic*) factors, resulting in discolorisation of the scalp hairs. Detailed explanation of pathology, symptomatology, causative factors, environmental and psychological factors of disease *Palitya* has been explained in Ayurveda with reference to *ShiroRogas*. Hence present paper emphasizes the critical analysis of childhood premature graying of the hair in children in present scenario and its Ayurvedic understanding along with preparation of its treatment protocol.

### KEYWORDS

*Perspiration, Palitya, Premature Graying Hair, Canities*



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## INTRODUCTION

Skin and hair has got a lot of concern for interest of cosmetic purpose, along with its normal physiological functions. It is obvious that hair length, colour, and style play an important role in physical appearance and self perception of an individual. Human beings are unique amongst primates in having very thick, long, and highly pigmented scalp hair, although colour of the hair varies due to geographical and racial differences. The term premature graying is applied, when abnormal graying will be found before the age of 20 in whites, age of 25 in Asians and age of 30 in Africans. However, during recent past, the incidence of premature graying hair is strikingly increasing in young population especially between the ages of 20-30 groups. Unfortunately same has been also matter of concern in children also where, the incidences are increasing considerably.

It is a well known fact that the colour of human hair depends on melanogenesis through a process of synthesis of melanin and its subsequent distribution from melanocyte to keratinocyte. However, the process is thought to be regulated genetically at various levels. The human hair follicles contain two type of melanin, the black brown pigment eumelanins

mainly present in black and brown hair and the yellow or red pheomelanins in red and blonde hair<sup>1</sup>. Premature graying leads to embarrassing & social stigma, and ultimately ending up in social withdrawal of the child. Although medical field put forth many treatment modalities for the same, but available treatment are not much satisfactory, necessitating a search for newer drugs.

Ayurveda, the richest heritage of India long back highlighted this burning problem and categorized the same under the heading of *Palitya*. Which mainly focus on *Palitya* due to various internal and external causes. The disease *Palitya* is mentioned under the heading of *Kshudraroga* and *Sirogataroga* in *Sushruta Samhita*<sup>2</sup>. The main etiology of *Palitya* is vitiation of *Dehoshma* and *Ushna Guna* of *Pitta* which circulates to *Romakoopa* and causes *Paka* of hair<sup>3</sup>. Mean while the treatment of *Palitya* mainly focused on includes *Shodhana* (purificative) and *Shamana* (palliative) along with *Nidana Parivarjana* (avoiding the cause).

## AIMS AND OBJECTIVES

- Review and critical analysis of premature graying of hair in children.
- To evaluate etiopathogenesis of *Palitya* in children.



- To study treatment protocol for management of premature graying of hair (*Palitya*) in childhood clinical practice.

## MATERIALS AND METHODS

Information on premature graying of hair (*Palitya*) is collected from different Ayurvedic and contemporary medical textbooks, magazine, journal, internet. It is a review article and data has been collected from all available sources.

### ETIOLOGY ACCORDING TO CONTEMPORARY SCIENCE<sup>4</sup>

Certain causes are attributed for the pathological sequence of premature graying of hair. Many theory and hypothetical views has been proposed which are summarized below.

**Achromotrichia:** Melanin is produced in the root of hair, hence the colour of hair changes. Stem cell which is based on the hair follicle from produce melanocytes, the work of cell is to produce and store pigment in hair and skin. The graying of hair is beginning due to the death of melanocyte cell.

**Free radical theory:** Free radicals are highly reactive molecules with unpaired electrons that can directly damage various cellular membranes, proteins, lipids and DNA. The damaging effect of these reactive oxygen species are induced

externally through exposure to various oxidative stresses from the environment. The ageing phenotype of hair manifests as decrease of melanocyte function.

**Stress:** Researchers have found that the effect of the hormone produced in response to stress is influenced by melanocyte cells. Hair colour becomes gray due to the effect of the melanocyte cells. But there is no clear relationship between stress and gray hair yet.

**Medical conditions:** Some disease causes gray hair like Vitiligo, Albinism, Pernicious anemia, Werner's syndrome and thyroid disease.

**Genetic disorders:** Albinism is a genetic disorder in which the human body not or little found pigment in the hair, skin and eyes. The hair is often gray or pale blond. Vitiligo which can be result of autoimmune disease causes patchy loss of hair and skin colour. Werner's syndrome is caused by abnormal changes in the WRN gene. The WRN gene encodes for a helicase protein, suggesting that impaired DNA metabolism is involved in the premature aging.

**Nutritional factor:** In malnutrition the hair became thinner and more brittle due to not receiving nourishment of hair. Black hair may turn red or blond due to decreased production of melanin. Nutritional deficiencies like vitamin B12 deficiency, severe iron deficiency, chronic protein loss,



copper deficiency are often found associated with premature graying of hairs. Other factors that have been incriminated are low serum ferritin, and low serum calcium and vitamin D3 levels.

**Syndromes:** Premature graying of hair may occur alone as an autosomal dominant or in association with various autoimmune disease or syndrome. Down syndrome (trisomy of chromosome 21) leads to acceleration in aging include premature graying of hair.

**Environmental factors:** Smoking is also an important cause of gray hair before the time. As a result of smoking, oxidative stress increases, which results in damage to melanin producing cell melanocytes. Prolonged exposure to ultraviolet rays in hair follicles results premature graying of hair.

## ETIOLOGY ACCORDING TO AYURVEDA

The increased heat or *Ushnatwa* of the body reaches to the *Shiropradesha* or scalp area by certain psychosomatic causes like grief, fatigue, anger etc, and gets mixed with vitiated *Pitta Dosas* and further afflicts the hair and ripens the hairs and causes *Palitya* (gray colour of the hair)<sup>5</sup>. Although for the disease of *Palitya*, no specific *Nidana* are mentioned, but still on basis of *Samprapti*, *Pitta Prakopaka Nidana*<sup>6</sup>, *Rasadushti*<sup>7</sup> and *Asthidushti*<sup>8</sup>

pathology can be understood. Certain *Nidanas* of *Kshudra Roga* as well as *ShiroRogas* can be also taken for better understanding of disease *Palitya*. *Nidana* of *Palitya* can be classified as Dietary (*Ahara*), Environmental (*Vihar*), Psychological (*Manasika*), Unknown causes (*Adibalapravrita*) for convenient purpose.

Child consuming the diet with dominantly, *Ushna* (hot), *Tikshna* (Spicy) properties and *Rasas* like, *Lavana* (salt), *Amla* (acid), are more prone to *Palitya*. Further dietics of *Vidahi* (burning) property is also one of the common causes. Mean while certain *Pitta Vardhaka Ahara* like *Tila taila* (sesame oil), *Kulatha* (horse gram), *Sarshapa* (mustard), *Dadhi* (curd), *Kanji* also predisposes to *Palitya*. These vitiate *Pitta* and affect *Rasa Dhatu Poshana karma*. *Rasa Dhatu* and *AsthiDhatu* is the cause of *Palitya*. When *Ahararasa* is not digested properly it results in improper formation of *Dhatus* leading to *Palitya*<sup>10</sup>. Excessive use of *Pippali* (long pepper), *Lavana* (salt), and *Kshara* (alkaline materials) also causes of *Palitya*<sup>11</sup>. Further certain Environmental (*Vihara*) causes like *Ratrijagarana*, *Atapasevana*, *Dhumasevana*, *Dushitavayusevana*, *Dushitajalasnana*, *Ativyayama* and *Upavasa* are important in the manifestation of *Palitya*. Due to above causes, scalp and



hair follicles are improperly nourished, resulting in premature graying of hair.

Meanwhile certain psychological factors (*Manasika*) like *Krodha* (anger), *Shoka* (grief), *Adhikachinta* (psychological stress), and *Manasika sharama* (excess mental work) are considered to be both *Pitta* and *Vata Prakopa Nidanas* responsible for premature graying of scalp hairs. Further, certain idiopathic causes (*Adibalapravrta*) will also contribute for development of premature graying of hairs especially in child with *Pitta Prakriti*<sup>12</sup>.

### **SYMPTOMATOLOGY OF PALITYA (ROOP)**

The symptomatology of *Palitya* has been attributed to *Tridosha Pradhanta* by *Ashtang Hridayam*. In case of *Vata Pradhana Palitya*, *Sphutitam* (cracked), *Shyava* (black in colour), *Karksha* (rough), *Ruksha* (dry), *Jwalataprabham* (watery) are commonly seen. Mean while in *Pitta Pradhana Palitya Dahayukta* (burning sensation), *Pita* (yellow colour) will be evidenced. Further, in *Kapha Pradhana Palitya Snigdha* (smooth), *Vivradhi* (growing), *Sthula* (thick), *Shukla* (white) will be seen. In *Tridoshaja Palitya Sarva Dosha Lakshana Yukta* (mixed features of all the *Dosas*) will be seen. Another kind which arises from headaches is discolored hair and does not tolerate touch, this is incurable<sup>13</sup>. *Acharya Yogaratnakara* also

mentioned the same as *Vataja* with *Vishama* (irregular), *Ruksha* (dry) and *Pittajawhich* is *Pitabha* (yellowish) *Kaphaja* with *Asita* (whitish) and *Sannipataja* with *Sarvrupanvita* (*Tridoshaja lakshana*) as symptoms<sup>14</sup>.

Mean while *Madhava Nidana* explains *Kalaj Palitya* in which graying of hair occurs after an age, while *Akalaj Palitya* occurring in early age due to vitiation of *Shariroushma* and *Pitta Dosha*<sup>15</sup>.

### **ETIOPATHOGENESIS**

#### **(SAMPRAPTI)<sup>16</sup>:**

*Acharya Susharuta and Madhavakara* have emphasized pathogenesis with the increase of *Vayu* especially due to excess of *Shoka*, *Krodha* and *Shrama*. At the same time the *Pitta* is being increased in its *Ushna Guna*. This provoked *Pitta* circulates throughout the body through *Rasayana* is by the virtue of *Vikshepana Guna* of provoked *Vata* to increase the *Sharira Ushma*. This *Sharirika Ushma* reaches to *Shiras* and vitiates *Sthanika Vatakarya* and *Shleshma Karya*. The *Sthanika Pitta* and *Kapha Dushana* happen, causing *Bhranjakagni Dushti*. *Bhrajaka Pitta* works are hindered and causing *Vikrita Kesha Varna Utpatti*. This *Samprapti* emphasizes the involvement of *Dehoshma* in the disease pathology. Another *Samprapti* of *Akalaja Palitya* initiate with *Jatharagni Dushti* due to *Pitta Pradhana Tridosha Dushti* resulting *Asthi*



*Dhatwagni Dushti*, which leads to improper formation of *Mala Bhaga* of *Asthi* i.e. *Kesha*. As there is *Dushti* of *Kesha Poshaka Bhava* and *Dushti* of *Sthanika Bhrajaka Pitta, Shleshma* and *Vata, Vikrita Varna* of *Kesha* takes place. If the *Dushti* occurs at any levels of *Samprapti, Kesha Utpatti Prakriya* hinders and *Kesha Varna Utpatti Vikriti* occurs. The *Vyadhi Kriya Kala* of *Akalaja Palitya* initiates with *Sanchayavastha* occurring at *Aamashaya, Prakopa* takes place in *Koshtha* and *Prasaravastha* occurs in *SarvaSharira. Roma Koopa* is the place where in the *Dosha-Dushya Sammurchana* takes place and the disease manifests.

#### **SAMPRAPTI GHATAKA:**

**Table 1** (*SampraptiGhataka* of *Palitya*)

<i>Dosha</i>	<i>Tridosha (Pitta-Bharajaka pitta pradhana)</i>
<i>Dushya</i>	<i>Rasa, AsthiDhatu</i>
<i>Agni</i>	<i>Jatharagni, Dhatwagni</i>
<i>Srotus</i>	<i>Rasavaha, Asthivaha</i>
<i>Srotodusti</i>	<i>Sanga, Vimarg-gamana</i>
<i>Udbhavasthana</i>	<i>Aamashya</i>
<i>Vyadhiadhistan</i>	<i>Keshabhumi</i>
<i>Rogamarga</i>	<i>BahyaRogaMarga</i>
<i>SadhyaAsadhyat</i>	<i>Ekdoshaja Sadhya,</i>
<i>a</i>	<i>Sannipataja Asadhya</i>

#### **CONTEMPORARY VIEWS ON ETIOPATHOGENESIS**

The pigmentation of hair follicles is due to melanin. Melanin is two types: eumelanin and pheomelanin. The colour of human hair

depends on melanogenesis, the process of synthesis of melanin and its subsequent distribution from the melanocyte to keratinocyte. The biological process of gray hair appears to be associated with the progressive loss of pigment producing cells. Depletion of melanocytes leads to premature graying of hair<sup>17</sup>.

#### **CURRENT TREATMENT TRENDS<sup>18</sup>**

In spite of various researches treatment option remain far from satisfactory and no effective therapy is available.

- Topical antiaging compounds.
- Oral supplementation with 1-cystine and 1-methionine, and topical melatonin.
- Large doses of P-aminobenzoic acid (PABA).
- Prostaglandins (stimulators of melanocyte growth and melanogenesis).
- Temporary hair colorant is used worldwide.

#### **TREATMENT TRENDS IN AYURVEDA**

The treatment principle of *Palitya* is avoidance of causative factors like *Pittavardhaka Ahara* and *Vihaara* after that the patient should be administered purification therapies (*Samshodhana Chikitsa*) and then treated with nasal medication (*Nasya Karma*), anointing the face and head (*Vaktra-siro Abhyanga*), application of pastes (*Lepa*) and oral medications.<sup>19</sup>



### **SAMSHODHANA CHIKITSA:**

*Panchkarma* plays important role in *Chikitsa* of *Palitya* as *Acharya Charaka* and *Vagbhatta* mentioned *Samshodhana* therapy causes expulsion of vitiated *Dosha* and thus breaks the *Samprapti* of *Palitya*. *Vamana* expels *Apakva Pitta* and *Kapha Dosha* from *Urdhavamarga*. *Virechana* expels *Pitta Dosha* from *Adhomarga*<sup>20</sup>.

### **NASYA KARMA:**

In *Akalaj-Palitya* the *Navana* and *Pratimarsha Nasya* are mentioned. The *Yogas* for *Nasya karma* mentioned in different classics have been given below.

#### ***Yogas for Nasya karma***

- 1) 1 *kudava tila taila* + 1 *Prastha Bhringaraja Swarasa* + 1 *Pala Yastimadhu* + 1 *Prastha Godugdha*- oil used in *Akalaja Palitya*
- 2) ***Bhringaraja Ghrita***: *Bhringaraja Swarasa* + *Mayura Pitta* + *Goghrita*- used twice a day for one week
- 3) ***Prapoundarikadi Taila***: *Prapaundrika* + *Amalaki* + *Pippali* + *Utpala* + *Madhuka* + *TilaTaila*.
- 4) ***Chandanadya Taila***: *Chandana* + *Triphala* + *Neelotpala* + *Priyangu* + *Guduchi* + *Shunthi* + *Madhuka* + *Moorva* + *Lohabhasma* + *Jatamansi* + *Sariva* + *Krishna sariva* + *Bhringaraja* - Oil used in *Akalaja Palitya*.
- 5) ***Kashmaryadi Taila***: *Kashmarya* + *Arjuna* + *Arkaphla* + *Triphala* + *Madhuka*

+*BhrigarajaSwarasa* - oil used in *Akalaj Palitya*.

6) ***Bhrigaraja Taila***: *Tila Taila* + *Goksheera* + *Bhrigaraja Swarasa* + *Yastimadhu Kalka*- oil used in *Palitya*.

7) ***Nimba Beejadi Taila***: *Nimba Beeja* + *Bhringaraja Swarasa* + *Asana Kwatha-Taila* are used for *Nasya* in *Akalaj Palitya* with restriction milk and rice as diet.

8) ***Nimba Taila***: *Nimba Taila* used in *Akalaj Palitya* for 1 month with *Goksheer*.

9) ***Neelyadi Taila***: *Neeli patra* + *Shirisha patra* + *Saireyaka patra* + *Bhringaraja swarasa bhavita* + *Tila Beeja* + *Gunja beeja*- Oil is used in the form of *Nasya*.

10) ***Ksheeradi Taila***: *Godugdha* / *Aja Dugdha* + *Sahachara Swarasa* + *Bhringaraja Swarasa* + *Tulsi Swarasa* + *Yastimadhu Kalka* + *Tila Taila*.<sup>21</sup>

#### ***Shiro abhyanga***

- 1) *Yashtimadhuka taila*:- *Yashtimadhu* mixed with *Amalaki Sawarasa*.
- 2) *Nilikadi taila*
- 3) *Bhringaraja taila* :-*lohakitta* + *trifala*+ *sariva* mixed with *Bhringaraja swarasa* and oil.
- 4) *Maha Neela taila*
- 5) *Sarayakadi taila*<sup>22</sup>

#### ***Shiro Lepa***<sup>23</sup>

1) *Lohabhasma* + *Bhringaraja* + *Haritaki* + *Vibhitaki* + *Amalaki* + *Black soil* – all taken in equal quantity powdered and mixed with





sugar cane juice after that kept it for one month than applied over hair.

2) 2 karsha Amalaki fruits + 2 karsha Haritaki fruits + 1 karsha Vibhitaki fruits + 5 karsha Amra majja + 1 karsha Loha bhashma- all are mixed well than kept in Iron jar for whole night than applied it over hair in the morning.

3) Amalaki + Haritaki + Vibhitaki + Loha churna + Bhringaraja swaras- all are mixed than kept it matured coconut for month than applied it over scalp.

4) Karveera moola + Ksheera – past applied in root of gray hair.

5) Priyaladi Lepa: - Ksheera+ Priyala+ Yashtimadhu+ JivakadiGana +Kala Tila+ Pippali.

6) Tiladi Yoga:- Amalaki Churna +Kala Tila+ Kamal Keshar +Yashtimadhu mixed with honey.

7) Other Yoga<sup>24</sup> :-

(a) Yashtimadhu +Amalaki +Madhu.

(b) Tila +Amalaki +Madhu.

(c) JamunaAsthi + Kasis+ Loha Kitta + Sharkara.

(d) Sereyak Pushpa + Nilini + Trifala + Bhringraj mixed in Ajamutra.

(According to *astanga hridaya* in case of *Palitya* the root of the hairs should be smeared with past of *madhuka* and *amlaka* added with honey or *tila amalaka* mixed with honey and oil or *tuttha*, kernel of *aamra* and *jambu*, *kasisa*, *pitta* added with

*sarkara* or flower of *sairyaka*, *nilini*, *tripfla*, *bhringaraja* macerated in the urine of black goat.)

### KRISNIKARANA YOGA

1) *Utpala* triturated with milk should be kept underground for one month. This *kalka* is applied over the scalp hair, which help in scalp hair becomes black and unctuous.

2) Flowers of *Bhringaraja* and *Japa* are triturated along with the sheep's milk pasted over a *Lohapatra* (iron vessel). Later it was being kept underneath the mud for seven consecutive days. It should be removed on the eighth day and again triturated with juice of *Bhringaraja* and little quantity of *Ghrita* is added to it. This *kalka* is applied over the scalp area and wrapped with banana leaves, which helps in premature graying of scalp hairs<sup>25</sup>.

### ORALMEDICATION

•Amalaki rasayan •Amalaki+ Krishna tila +Bhringarajarasayan•Vridhdadarukamula rasayan •Bhringarajadi rasayan •Siddha makardhwaj •Vasant kusumakar ras •Gokshura+ amlaki + amrita churna with honey and ghrita (in unequal quantity).  
•Saptamrita loha •Loha churna  
•Bhringaraja churna •Guduchi churna

### DISCUSSION

*Palitya* is a disease which has no satisfactory treatment till date. The reason



behind this may be improper execution of treatment. In *Ayurveda* the first line of treatment seems *Shodhana*. *Shodhana* expels vitiated *Doshas* from body. Basic pathogenesis of *Palitya* is based on either *Dhatu Kshya /Dusti* or *Margavarodha* or sometimes both. Any treatment works better after proper *Shodhana* like a clean cloth can be better coloured than dirty cloth. Therefore *Shodhana* should be treated as the first line of treatment here. Amongst *Shodhana*, though *Vamana* and *Virechana* are best but *Nasya* seems treatment of choice in *Palitya* because of its action on *Uttamanga* and it can act as both *Shodhana* and *Shamana*. Though *Vamana* and *Virechana* should be planned prior to *Nasya* in presence of *Bahu doshavastha*. If we go through the mechanism of *Nasya*, it is observed that the drug which is administered by nasal route it is absorbed by three process in nasal mucosa. The olfactory neurons, second by supporting cells and surrounding capillaries and the third way by cerebro-spinal fluid (CSF). The trans-neuronal absorption is generally slow where as by supporting cells and capillary network it is rapid. The posture involved during the *Nasya* process in such a way that head is lying down leads to momentary hyperaemia and capillary are get dilated and results in 150% blood flow. There is also possibilities of falling arterial

pressure and may encounter Cushing's reaction. When the ratio between CSF pressure and cerebral artery pressure is reduced, the increased CSF pressure leads to compress the artery in brain results a transient ischemia in brain. As a result the arterial "ischemic response" will raise the arterial pressure in reference to limbic system the olfactory pathway influencing hypothalamus which in turn may cause the inhibitors effect through the pituitary to secrete MSH. *Shiro abhyanga, dhara, lepa* are other external treatments which can be used simultaneously but there results are limited if used without *Shodhana*. Moreover, many oils and *Lepas* are only *Krishnikarna* in nature so cant't is taken as a genuine treatment. Although some of these may act as a stimulant or nutrient for the hair follicles like *Nimba beeja taila, Bhringaraja* and *Nirgundi, lepa of karveer moola swarasa* and *dugdhika swaras* etc can act on *Margaavrodha*. *Bhringaraja, nirgundi, lohachurna* acts as *Kesharanjana*. After proper *Shodhana, Shaman* drugs should be given.

## CONCLUSION

After discussion we can conclude that *Palitya* is a disease which has *Shrotorodha* along with *Dosha Prakopa*. So we can say that the alternate use of *Shodhana* and



*Samana* treatment can bring satisfactory results in *Palitya*. Therefore after doing the first *Shodhana karma*, if *Samana karma* is used with *Yukti Pramana*, can become a remedy for *Palitya*. *Yukti* is very important in the proper treatment of any disease. *Yukti* of medicine depends on *Matra* and *kala*. If any medicines are given with *Yukti*, good results are given.



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