Case Report

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MANAGEMENT OF HAIR DYE RELATED CONTACT DERMATITIS: A CASE REPORT

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ABSTRACT

In this advanced era, the desire to look younger and to optimize beauty is widespread. Grey hair is the common cosmetic problem which involves treatment of the hair with various chemical compounds in the form of hair dye to cover it. These hair dye products can cause various adverse effects, including allergic contact dermatitis. A 45-year-old man reported on 7th January 2020 to outpatient department with presenting complaints of severe itching, redness, burning sensation, discomfort, papules and vesicles over the scalp, forehead, hairline margin, around the eyelids, ears, lips and oral cavity with mild edema of the face and eyelids since 2 days. Patient provided the history of use of commercial hair dye 2 days prior to the incident. He also furnished the history of similar reaction observed a year back for which he had taken modern treatment. He was administered *Sutashekhar Rasa* orally and *Jatyaditaila* for topical application and as mouth paint. By the end of 1-week treatment, signs and symptoms of acute phase of dermatitis completely subsided.

Keywords: Adverse reaction, Ayurveda, Jatyaditaila, *Sutashekhar rasa*

INTRODUCTION

Hair is a protein filament that grows from follicles found in the dermis. Each strand of hair is made up of the medulla, cortex, and cuticle. All-natural hair colors are the result of two types of hair pigments. Both of these pigments are melanin types, produced inside the hair follicle and packed into granules found in the fibers. Grey hair occurs when melanin production decreases or stops¹. Cause of greying is incompletely understood. It is a complex multi-factorial process mainly considered to be interplay of nutritional, genetic and environmental factors. Nutritional deficiencies like vitamin B12 deficiency, severe iron deficiency, chronic protein loss, copper deficiency are often found associated with premature greying of hairs. Other factors that have been incriminated are low serum ferritin, and low serum calcium and vitamin D3 levels^{2,3}.

The dyeing of hair is an ancient art that involves propylene glycol treatment of the hair with various chemical compounds. In ancient times, the dyes were obtained from plants⁴. Some of the most well-known are henna (*Lawsonia inermis*), indigo, *Cassia obovata*, senna, turmeric and amla. Others include katam (*Buxus dioica*), black walnut hulls, red ochre and leeks⁵. Hair dyeing products can cause various adverse effects, including allergic contact dermatitis. Exposure to hair dyes has long been known as a significant risk factor for development of allergic contact dermatitis among the exposed population, as these lead to severe eczema of face and upper trunk in the consumer and hand eczema in hairdressers. In Asia, the sensitization prevalence to para-phenylenediamine (PPD) has ranged between 2% and 12% with relatively higher prevalence in Asian men than in women⁶. Among the composition of hair dye, PPD, m-aminophenol, p-methylaminophenol and propyleneglycol are known as the primary substances⁷. Clinically, it may present as irritant contact dermatitis, allergic contact dermatitis, photo contact dermatitis and contact urticaria and contact leucoderma, mostly in young to middle-aged individuals. Contact anaphylaxis due to hair dye has

also been reported⁸. Symptoms of these reactions can include redness, sores, itching, burning sensation and discomfort. These features will sometimes not be apparent immediately following the application and processing of the tint but can also arise after hours or even a day later⁹.

The current treatment includes the withdrawal of causative hair dyes. Regular use of sunscreens over sun-exposed areas with SPF 30 should be advised to those who manifest photosensitivity. Additional protection with use of appropriate clothing and wide brim hats is helpful. Symptomatic relief can be achieved with the use of topical steroids in lotion formulation, although care should be taken to avoid super-potent steroids on face and their prolonged use to prevent the adverse effects. In severe cases, short course of systemic steroids may be required. Systemic antihistamines to counter the itching may be needed¹⁰.

Case history

A 45 year old, non hypertensive, non-diabetic male presented to the outpatient department of Regional Ayurveda Research Institute for Metabolic Disorders, Bangalore with complaints of itching, redness, burning sensation, discomfort, papulation and vesicles over the scalp, forehead, hairline margin, around the eyelids, ears, lips and oral cavity with mild edema of the face and eyelids since 2 days. He has given the history of use of commercial hair dye before occurrence of symptoms. He had experienced similar reaction a year back, for which he had undergone allopathic treatment. It was a prior diagnosed case of acute contact dermatitis developed due to use of hair dye with no systemic involvement.

On physical examination

Patient was afebrile, with normal systemic functions. On local examination, skin manifestations like erythema was found on the scalp, forehead and hairline margin, around the eyelids, ears, lips

and oral cavity along with reddish discoloration with less distinct borders.

The condition was diagnosed as contact dermatitis on the basis of patient presenting complaints and previous history of similar features.

Treatment

Informed consent was taken prior to photography and publication. The treatment was planned based on the involvement of *dosha* and *dushya*'s with predominance of *pitta* and *kapha dosha lakshana*'s.

Table 1: Details of administration of medicines

Date	Medicine	Dose	Anupana (vehicle)	Duration
7-1-20	a. <i>Sutashekara Rasa</i> (AFI, Part 1, 20:52, Pg.27)	1 tablet Twice a day, before food	water	7 days
	b. <i>Jatyaditaila</i> (AFI, Part-1, 8:17, Pg. 135)	Local application and as mouth paint	-	7 days

*a and b medicines are procured from Indian Medicines Pharmaceutical Corporation Limited (IMPCL)

RESULTS

Patient was observed for 7 days with medicines and 7 days without medication. By the end of treatment, the symptoms of

acute phase of dermatitis completely subsided. The features of skin manifestations before and after treatment are depicted in Table 2 and Figure 1.

Table 2: Observations before and after treatment

Feature	Day 1	Day2	Day 7	Day 14
Location	scalp, forehead, hairline margin, around the eyelids, ears, lips and oral cavity	scalp, forehead, hairline margin, around the eyelids, ears, lips and oral cavity	None	Observation and photos taken
Symptoms	severe itching, redness, burning sensation, discomfort, papulation and vesicles	severe itching, redness, burning sensation, discomfort	None	There was complete remission of symptoms
Surface appearance	erythema	Scaling	clear	Clear
Colour	Reddish	Hyper pigmented skin	normal	Normal
Lesion borders	Less distinct borders	Less distinct borders	clear	Clear

Figure 1: Skin manifestations before and after treatment

DISCUSSION

Graying of the scalp hair is an inevitable physiological process in human aging. It is caused by the loss of the pigmented-forming melanocytes from the hair follicles, which reflects loss of the melanocyte stem cell population in the aging hair follicles¹¹⁻¹³. Hair coloring, or hair dyeing, is the practice of changing the hair color. The main reasons for this are cosmetic: to cover grey or white hair, to change to a color regarded as more fashionable or desirable, or to restore the original hair color after it has been discolored by hairdressing processes or sun bleaching¹⁴.

Hair dye is an emulsion-based hair dye commonly used in India. The main ingredients of the dye are paraphenylenediamine (PPD), resorcinol, propylene glycol, sodium ethylene diamine tetra acetic acid (EDTA), preservatives and perfumes¹⁵. Though the patch test is advised, it is rarely followed.

Currently, PPD is the main hair color product in the market and is the most important allergen. Prevalence of PPD sensitization is high in patients with contact dermatitis across all continents, with hair dye use being the commonest cause. The conventional treatment for allergic reaction includes the withdrawal of

causative hair dyes, use of topical steroids and if severe systemic anti histamines can be administered. After assessing the symptomatology of this condition, dosha involved, which was predominantly *pitta* associated with *kapha*, being in acute phase, a formulation was planned accordingly and administered. *Shamana aushadhis* like *Sutashekhar rasa* and topical application of *Jatyaditaila* was advocated. The *Sutashekhar rasa* is a very well-known herbo-metallic- mineral preparation, which is one such prime formulation which takes corrective action on the *Pitta dosha* and mainly constitutes *Suddha parada* (processed cinnabar), *Shuddha gandhaka* (processed Sulphur), *Tvak* (*Cinnamomum zeylanica*), *Ela* (*Elettaria cardamomum*), *Patra* (*Cinnamomum tamala*), *Nagkesara* (*Mesua ferrea*), *Shankha Bhasma* (*Turbinella pyrum*), *Swarnamakshika Bhasma* (Chalco pyrite), *Rajata Bhasma* (Argentum), *Tamra Bhasma* (Cuprum), *Pippali* (*Piper longum*), *Maricha* (*Piper nigrum*), *Shunthi* (*Zingiber officinale*), *Tankana* (Borax sodium borate), *Dhatura seed* (*Dhatura metel*), *Bhringraja Swarasa* (*Eclipta alba*).¹⁶ This was advised as a *lakshanika* (symptomatic) *chikitsa* as well as due to its *pittahara* properties. *Jatyaditaila* contains ingredients like *Jatipatra* (*Asminum grandiflorum* L.), *Nimba patra* (*Azadirachta indica* A. Juss.), *patola patra* (*Trichosanthes dioica* Roxb.), *Naktamala patra* (*Pongamia pinnata* Oierre.), *siktha* (Honey- bee

wax), *madhuka* (*Glycyrrhiza glabra* Linn.), *Kustha* (*Saussuria lappa* Decne. Sch. Bip.), *nisha* (*Curcuma longa* Linn.), *katurohini* (*Picrorhiza kurroa* Royle ex Benth), *Manjishtha* (*Rubia cordifolia* L.), *Padmaka* (*Prunus pudam* Franch), *lodhra* (*Symplocos racemosa* Roxb.), *abhaya* (*Terminalia chebula* Retz), *neelotpala* (*Nelumbium speciosum* Wild.), *tuttha* (Copper sulphate), *sariva* (*Hemidesmus indicus* L. R. Br.), *Naktamala bija* (*Pongamia pinnata* Pirre.) and *tilataila* (Sesame oil)¹⁷. It was given as it is a medicated oil formulation popularly used in the treatment of various topical wounds due to its *vranahara* properties (wound healing)¹⁸. Also, in various studies it has shown significantly faster reduction in wound area by increasing the protein, hydroxyproline and hexosamine content in the granulation tissue¹⁹. In this case, the skin eruptions and itching subsided significantly by the end of treatment. Hence this case study proves to be effective in managing the acute condition of contact dermatitis through Ayurveda. Safety and toxicity studies were not done as the patient could not afford.

CONCLUSION

Hair dyeing products can cause various adverse reactions which are never ending but less commonly reported unless very severe causing discomfort to the person's day to day activities. Hence, an attempt has been made to publish this successful case which has been effectively treated with only Ayurvedic medications without involvement of any other conventional treatments to instill confidence among young practitioners.

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