

# A Clinical Study of Holi Dermatoses in Garhwal Region of Uttarakhand

Prakriti Sharma

Senior Resident, Department of Dermatology

VCSG government institute of medical sciences & research, Srinagar Garhwal, Uttarakhand, India

Corresponding author Email: [prakritis168\[at\]gmail.com](mailto:prakritis168[at]gmail.com)

**Abstract:** Introduction: Holi is a time of vibrant celebrations and joyful gatherings. However, amidst the vibrant hues and festive fervour, it's crucial to safeguard your skin, hair and nails from potential damage caused by harsh chemicals and dyes. Aim: To study the pattern of cutaneous findings among people of Garhwal region of Uttarakhand following Holi celebration. Methodology: This was a hospital based cross-sectional study conducted for a period of four weeks following Holi festival. Patients who attended dermatology outpatient department (OPD) with different cutaneous manifestations following application of "Holi" colors were included in this study. Provisional diagnosis was made on the basis of history and examination after obtaining consent from patients. Results: A total of sixty-five patients were studied for the presence of cutaneous manifestations. There were 38 (58.5%) females and 27 (41.5%) males. Pruritus (72.3%) was the most common presentation followed by xerosis (56.9%), erythema (49.2%), burning sensation (32.3%), eczematous lesions (13.8%) etc. Exacerbation of the pre-existing skin disorders such as acne, contact dermatitis was seen in few patients. Extra-cutaneous findings such as redness and watering of eyes were also noted. Conclusion: Holi colors can take a toll on the skin, hair and nails due to their synthetic nature. Therefore, it is essential to spread adequate public awareness regarding their hazardous effects. Regulatory control over marketing and selling of harmful chemicals is needed to prevent skin diseases.

**Keywords:** Holi, Colors, Chemicals, Skin

## 1. Introduction

"Festival of color" is celebrated all over India since the ancient times with great fervour. It marks the end of winter and welcomes the spring season. Humans have always enriched their appearance with various body paints derived from natural resources. Plants and their by-products have been used to paint skin, hair, nails and clothing for festivities, rituals and religious purposes. The major botanical colorant groups such as chlorophylls, carotenoids, flavonoids, and betalains provide an endless variety of colors that has inspired art and has medicinal importance.<sup>[1]</sup> These botanicals were presumed to be beneficial to the skin according to the principles of Ayurveda. With the spread of industrialization and due to huge demand by different sections of population, inexpensive industrial chemicals eventually replaced the natural colors. These bright industrial colorants are usually sold openly by the street-side hawkers and temporary shops, usually without any necessary knowledge or documentation of the precise ingredients.<sup>[2]</sup> In addition, use of contaminated starch or wheat flour in colorants can further increase the potential risks of skin or ocular infections.<sup>[3]</sup>

## 2. Methodology

This was a hospital based cross-sectional study conducted for a period of 4 weeks after Holi festival (8<sup>th</sup> march, 2023-8<sup>th</sup> April, 2023) in VCSG government institute of medical sciences and research situated in Garhwal region of Uttarakhand. Patients (residents of Garhwal region) who presented to out-patient department of Dermatology with symptoms directly or indirectly related to Holi colors were included in the study. A total of 65 patients were evaluated and assessed for various skin findings as well as for any systemic involvement if present. Detailed history regarding

the age, gender, duration of symptoms, presence of pre-existing lesions etc. were taken. After taking consent from the patient/guardian, thorough clinical examination was performed in a broad daylight to assess the sites & morphology of the lesions. Provisional clinical diagnosis was made on the basis of history and examination. Data obtained from all patients was tabulated and analysed. Simple proportions and percentages for incidence was used.

## 3. Results

A total of 65 patients with age ranging from 15-45 years (mean age of 29.5 years) were studied. There were 38 (58.5%) females and 27 (41.5%) males with female to male ratio of 1.4:1. Pruritus was the most common cutaneous finding present in 47 (72.3%) patients. This was followed by xerosis (37, 56.9%), erythema (32, 49.2%), Burning (21, 32.3%) and eczema (9, 13.8%) as mentioned in table 1. Acute inflammation of the nail fold was seen in 3 (4.6%) patients following use of colors [Figure 2]. Few episodes of urticaria were observed in 2 (3%) patients. Exacerbation of the pre-existing dermatoses such as acne and contact dermatitis was also noted in 15 (23%) and 5 (7.6%) patients respectively [Figure 1&3]. Adolescent group showed the worsening of acne vulgaris whereas exacerbation of contact dermatitis was seen mostly in adults. One of the patients had exacerbation of seborrheic dermatitis post-celebration. Vigorous scrubbing and massaging over stained areas resulted in damaging skin in the form of abrasions in 7 (10.7%) patients [Figure 4]. Face was the commonest site to be affected post-celebration followed by hands, scalp, trunk etc. Extracutaneous finding related to ocular structure such as redness and watering of eyes were noted in 2 (3%) and 3 (4.6%) patients respectively. Details regarding the nature or type of colorants used by the patients could not be

determined but precisely majority of our patients had used synthetic colors according to available history.

**Table 1:** Patterns of clinical findings (cutaneous & extracutaneous) post-celebration

Clinical findings Cutaneous	No. (n=65)	%
1. Pruritus	47	72.30%
2. Xerosis	37	56.90%
3. Erythema	32	49.20%
4. Burning	21	32.30%
5. Eczematous	9	13.80%
6. Acute nail fold inflammation	3	4.60%
7. Urticaria	2	3.00%
8. Exacerbation of acne	15	23%
9. Exacerbation of contact dermatitis	5	7.60%
10. Abrasion due to scrubbing	7	10.70%
Extracutaneous finding- ocular		
1. Redness	2	3%
2. Watering	3	4.60%



**Figure 3:** Shows exacerbation of acne vulgaris along with secondary skin changes



**Figure 1:** Shows exacerbation of allergic contact dermatitis



**Figure 4:** Shows abrasive injury over face following vigorous scrubbing



**Figure 2:** Shows inflammation of proximal nail fold along with eczematous changes



**Figure 5:** Shows xerosis\dryness over cheek



**Figure 6:** Shows erythema and crusting over scalp

#### 4. Discussion

Cultural practices play an important role in medical disease and the skin is no exception. "Holi," the festival of colors is celebrated every year in India by splashing or spraying colors on each other. The natural colors used in ancient times have been substituted by cheap and harmful synthetic dyes, nowadays. Majority of the colorants being used contain potentially toxic ingredients such as Black (Lead oxide), Green (Copper sulfate, malachite green), Silver (Aluminum bromide), Blue (Prussian blue), Red (Mercury sulfate).<sup>[4]</sup> Most of these chemicals are phototoxic and provoke skin allergies. Mica dust often used in the dry colors as a sparkling agent can cause abrasive injury to skin in turn increasing risk to the secondary infections. These colors often include various synthetic and industrial dyes which may have detrimental effects on the mucosae as well.<sup>[5]</sup> They tend to have cutaneous as well as extra-cutaneous manifestations as a result of their synthetic nature. In our study, pruritus was observed to be the commonest cutaneous findings followed by xerosis, erythema and eczematous lesions in accordance with studies available in literature. Synthetic colors/dyes are expected to worsen preexisting skin condition as shown by the present study in 12 (30.6%) patients but establishment of direct association is still debatable considering the sample size of the study population. Although the present study happened to include section of adolescent age group (>15years) however, significant inference regarding the harmful effects of colorants in this age group could not be determined.

These colorants and their ingredients can cause ocular surface toxicity by induction of oxidative bursts in granulocytes. Malachite green, a common ingredient of holi colors has been considered as a priority agent for carcinogenicity tests. The ocular manifestations may vary from a mild conjunctivitis to severe corneal ulceration.<sup>[6]</sup> Only few extraocular findings such as redness and watering of eyes were observed in my study. Excessive use of holi colours can potentially increase concentration of suspended particulate matter in ambient air; which are related to a

higher cardiovascular and respiratory disorders.<sup>[7]</sup> However, involvement of other mucosal surfaces or organs could not be observed in the present study. Considering the harmful effects of readily available synthetic colorants, it is necessary to provoke awareness among public regarding its use and safety measures.

#### 5. Conclusion

Festivities are part and parcel of every section of population in India. Undoubtedly, color is the hallmark of holi but at the same time, it may carry potential risk to organs like skin, eyes, lungs etc due to its synthetic nature. Timely recognition of the signs & symptoms related to skin as mentioned in the present study can prevent the possible harmful effects and worsening of preexisting skin ailments. Awareness regarding the use of appropriate substitutes and necessary safety measures can prove helpful. In order to prevent avoidable health hazards and to preserve the essence of the festival, certain regulatory actions are mandatory to be put over manufacturing, sale and use of these chemicals.

#### 6. Limitations

Small sample size and inability to determine the nature of colorants/dyes used by study population were the unavoidable limitations of the present study

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