

## Bilateral periorbital necrotizing fasciitis following exposure to *Holi* colors: A case report

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*Holi* festival is celebrated in India traditionally by applying colors on one another. Various ocular adverse effects of these colors have been reported including conjunctivitis and corneal abrasion. We report a case of bilateral periorbital necrotizing fasciitis, following exposure to *Holi* colors. General physicians might encounter more such cases after exposure to *Holi* colors. In India, these colors are prepared on a small scale and lack any quality checks. Use of such toxic colors should be discouraged, and all doctors should caution people against using synthetic dyes. This case report highlights the need to put manufacturing of *Holi* colors under guidelines of the Food and Drug Cosmetic Act and the Bureau of Indian Standards.

**Key words:** *Holi* color, necrotizing fasciitis.

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*Holi* is a festival of colors, traditionally celebrated by greeting others by applying various powdered or water-based colors, usually on the face. These colors include various synthetic dyes which have harmful side-effects on the skin and mucocutaneous areas like the conjunctiva. This article is the first case report of a life-threatening infection as a result of exposure to *Holi* colors.

### Case Report

A 57-year-old male patient presented with redness, excessive watering and foreign body sensation in both eyes, along with painful swelling and skin ulcers around both eyes over the past two days. There was no history of trauma, diabetes or other systemic disease. However, the patient gave history of playing *Holi* with dry colors three days back. He was febrile for the past two days and had not sought any medical care.

On examination, there was conjunctival chemosis and small corneal epithelial abrasions, along with bilateral periorbital ulcerative lesions with superficial gangrene formation [Fig. 1]. The surrounding lid and facial skin was edematous and indurated. The ulcers were shallow, with a necrotic base and purulent discharge. Skin over the face and neck regions was stained pink due to exposure to the colors.

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**Figure 1:** Bilateral periorbital necrotizing ulcers with areas of superficial gangrene. Remains of the color staining some areas of the face (black arrow)

Patient was febrile (104° F). The rest of the examination was unremarkable.

A provisional diagnosis of necrotizing fasciitis was made. Swabs were taken from the ulcer base for culture and antibiotic sensitivity. Laboratory investigations included hemogram, erythrocyte sedimentation rate (ESR), blood sugar, enzyme linked immunosorbent assay (ELISA) for human immunodeficiency virus (HIV), and blood culture. Patient was started on intravenous broad-spectrum antibiotic therapy, which included ciprofloxacin, cefotaxime and metronidazole. Topical ciprofloxacin eye drops and artificial tear substitutes were prescribed along with application of mupirocin ointment over the ulcers.

Over the next two days, patient was afebrile but he developed deep-seated ulcers extending up to the orbital septum. Swab culture showed *Staphylococcus aureus* along with mixed anaerobic flora. Laboratory reports revealed marked leucocytosis with neutrophilia. Rest of the laboratory tests were normal. Repeated debridements of the necrosed tissue with irrigation of the ulcer bases with 5% povidone iodine solution was done. Over the next five days, the ulcers started to heal. Intravenous antibiotics were continued for the next 14 days along with daily dressings of the wound. As a result of scarring, patient developed bilateral cicatricial ectropion of all four lids. To prevent exposure keratopathy, temporary tarsorrhaphy was performed and patient was discharged on oral ciprofloxacin for the next seven days.

Bilateral lid reconstructive surgery was done at three months. Full-thickness skin grafting was done to reconstruct the anterior lamina of both the upper and lower lids. A thorough excision of the scar tissue was done and the lids were reconstructed with donor skin from the postauricular area and inner upper arm. In addition, on the right side, the scar tissue that was extending till the upper cheek area was excised thoroughly and the area covered with split skin graft. A temporary tarsorrhaphy was done and kept in place for six weeks. The final outcome was mild ectropion of lower lids and mild lagophthalmos and lid lag. However, there was no corneal exposure and the patient was kept on tear substitutes subsequently.

## Discussion

The colors used during *Holi* include various synthetic dyes like malachite green, auramine, methyl violet, rhodamine and orange II. These are often mixed in a base material like starch or wheat flour. At times, even mica dust is added to them to increase their shine. Most of these chemicals are phototoxic and incite skin allergies. Use of mica dust can lead to multiple microtrauma of skin and predispose to infections. Also, use of contaminated starch or wheat flour can further increase the chances of skin or ocular infections. We believe that these factors led to bilateral periorbital necrotizing fasciitis in our patient. Dada *et al.*<sup>1</sup> have reported ocular injuries due to *Holi* colors. In our case report, the patient also developed mild corneal epithelial abrasions and conjunctival chemosis due to exposure to the colors.

Necrotizing fasciitis usually occurs after trauma, especially in diabetics, chronic alcoholics and immunocompromised patients.<sup>2</sup> It is an uncommon but severe soft tissue infection causing cutaneous gangrene and suppurative fasciitis. It frequently involves the groin, lower extremities and abdomen<sup>3</sup> but occasional case reports of periorbital necrotizing fasciitis following trauma by wooden splinters<sup>4</sup> and head trauma<sup>5</sup> have been reported. Although *Streptococcus* and *Staphylococcus* are the most common infective agents, the necrotic base of ulcers may also develop secondary infection by a combination of various facultative and anaerobic organisms.

Periorbital necrotizing fasciitis carries a high rate of

mortality of up to 12.5%. This emphasizes the importance of an early diagnosis and a prompt, extensive intravenous antibiotic therapy along with repeated surgical debridement. Lid reconstruction surgeries may be required for complications like severe cicatricial ectropion and exposure keratopathy.

In India, *Holi* colors are prepared on a small scale and lack any quality checks. Alternatives like vegetable dyes prepared from various plant extracts have been developed in the Indian Toxicology Research Centre and National Botanical Research Institute. They lack the mechano-abrasive and phototoxic properties of synthetic dyes. Use of such non-toxic colors should be encouraged, and doctors should caution people against using synthetic dyes such as *Holi* colors.

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