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Hoil Festival : Celebration or Invitation to Diseases

Asha Gaikwad[*1], Niharika Shivhare[2], Anita Gour[3] Shirin Imam[3]
[*1]Maharani Lakshmi Bai Government Girls P.G. College, Indore (M.P.), India
[2]Acropolis Institute of Management Studies and Research, Indore (M.P.), India
[3]Christian Eminent College, Indore (M.P.), India

ABSTRACT

At Holi festivals, originally celebrated in India but more recently all over the world, people throw coloured powder (Holi powder, Holi colour, Gulal powder) at each other. Adverse health effects, i.e. skin and ocular irritations as well as respiratory problems may be the consequences. The aim of this study was to uncover some of the underlying mechanisms. Some of the observed unwanted health effects of Holi colours might be explained by the high content of PM10 particles in conjunction with the possible induction of a pro-inflammatory response and an oxidative leukocyte burst. The dry colors, have two components – a colorant and a base, both of which may cause cutaneous problems. Mica dust is often added as a sparkling agent to the dry powders that can lead to multiple microtraumas of skin and predisposition to infections. Use of contaminated starch or wheat flour for making herbal colours can further increase the chances of skin or ocular infections.

Keywords: *Gulal, metal oxides, industrial dyes, herbal colours, PM10, skin and ocular infections, etc.*

1. INTRODUCTION

Holi is an ancient festival that celebrates spring and the harvest, a symbolic commemoration of a legend from Hindu mythology which provides some of the ingredients for the celebrations. The legend centers on an arrogant demon king who repeatedly tries but fails to kill his son Prahlada for worshipping Lord Vishnu. Finally, the king's sister Holika, who is blessed to be immune to burning, sits with the boy in a huge fire. However, while the prince Prahlada emerges unhurt with the blessings of the Lord, his aunt burns to death. Huge bonfires are burnt on the eve of Holi as a symbolic mark of this event from mythology [1]. This vibrant festival is also associated with the legends of immortal love between Lord Krishna and Radha and connects to its color wars concerns the lord Krishna, who feels embarrassed by his dark skin compared with the fair skin of his love, Radha. So his mother suggests he smudge Radha's skin with color to make him feel better [1-2].

Traditionally, Indian men and women could not mingle, but Holi was an occasion when they could, touch one another with colorful pastes and "play."

2. USES OF COLOURS

Religious and cultural uses

Gulal powder has always had an important role in Hindu culture and has always been used for religious purposes. Besides Holi festival, the use of coloured powders appears in other ceremonies, such as funerals. In this case, in some populations, a particular ritual occurs when the deceased is a married man. The widow puts on all the ornaments she possesses and takes leave of her husband adorning him with all her jewels. Holding a small brass plate with coloured powders, she lets the men participating at the ceremony paint the face of the deceased. This ritual is associated with the one of marriage, in which the bridegroom and the bride anoint themselves with coloured powders for four days before the wedding. This ointment, indeed, is meant to prepare their bodies for conjugal life. Beyond the religious sphere, the consumption of Gulal powder is spread for different uses [2].

Scientific uses

One interesting use of this powder has been developed in the field of latent fingerprints. A study by Punjabi University of Patiala shows that the application of Gulal or food colours to latent fingerprints can give clear results. During this study, few grams of dry colours were taken and sprinkled over different surfaces, such as normal paper,

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top of CDs, aluminium foil, and aluminium sheet. It has been concluded that commonly and easily available agents are a useful substitute for the decipherment of latent prints [3].

Other uses

Gulal consumption related to Holi festival has been taken out from the Hindu context and desacralized. The desacralization consists in a distortion of the original meaning of the cultural elements at the base of the Holi ceremony, which has often suffered from a disrespectful treatment. Indeed, in the contemporary Western society, Holi festival has become a phenomenon of consumerism, with no longer religious aspects. Throwing Gulal powder has become something cool and fashionable: everybody use it to give to its own party an extra point [4 - 5].

The main reason why Holi is now so well known outside the Asian continent is the birth of many Holi remakes for commercial purposes. From the beginning of the 2000s, Europeans, Americans, and Australians started to follow the trend of going to parties that involved throwing coloured powders at each other, in a relaxed and peaceful atmosphere [6].

3. FROM HERBAL TO CHEMICAL

After the advent of synthetic dyes in the middle of 19th century, the disappearance of trees in urban areas and the pursuit of higher profits led to the abandonment of natural colours.

Chemical Colors

A visit to a doctor after the festival of colours is common in India. Diseases, specially of the skin and eye are bound to happen with the quality of colours that are now available in the market.

It may be noted that chemical colours came into vogue as they were earlier thought to be harmless. Besides their being convenient and cost effective options as against the natural colours. These days manufacturers mix harmful chemicals in colours and play with the health of the consumers for the sake of profit. The chemicals added by them are so injurious that if unfortunately they enter a human body, they may cause fatal infections.

These days most Holi colours sold in the market are oxidized metals or industrial dyes (malachite green, methyl violet, auramine O, and rhodamine B) mixed with engine oil. These chemicals are known to cause serious harm to person's health [5 & 7 - 9].

Sr. No.	Colour	Chemical from which it is obtained	Adverse Health effect
1	Green	Copper sulphate	may cause allergies in eye or even temporary blindness
2	Red	Mercury sulphite	may cause skin cancer or Minamata disease (mental retardation, paralysis, impaired vision, etc.)
3	Purple	Chromium Iodide	may cause bronchial asthma or other forms of allergy
4	Silver	Aluminium bromide	May lead to cancer
5	Black	Lead oxide	may cause renal failures or learning disability
6	Shiny	Mica granules and powdered glass	May lead to skin rashes and make skin sensitive to Sun
7	Pastes	Industrial dyes mixed with inferior quality oil	May cause skin allergy and temporary blindness

Further, when washed, these colours containing toxic metals, chemical dyes, grease, engine oil and toxic solvents enter the waterbodies, thereby leading to soil and water pollution. Even the way Holi is played is becoming dangerous. Throwing water filled balloons has become rampant, which is very harmful. People should realise, what

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is fun for them could cause injury to the eyes and ears to the other person, specially when thrown from a distance and with force. Pregnant women are advised not to play with these colours as it may get absorbed and harm the baby inside the womb. Isn't it a scary situation?

Herbal Colours

No matter how attractive the snthetic colours may seem, it is very essential to check the quality so as to avoid health problems that may follow. This ancient festival of colours can be more fun and harmless if you play with natural or organic colours. In fact, in recent years, the importance of eco-friendly and chemical-free colours has been stressed. These colours are skin-friendly and are also not harmful to the environment [7, 10 & 11].

The basic features of organic colours are:

- Non-toxic
- Skin-friendly
- Free from heavy metals
- Easy to remove
- Organic ingredients

Ingredients Used in Herbal Organic Colours are as follows

Sr. No.	Colour	Plant part from which it is obtained
1	Yellow	Turmeric (*Curcuma longa*), dried marigold flowers, yellow chrysanthemums
2	Green	mehendi leaves, tulsi leaves, neem leaves (*Azadirachta indica*)
3	Blue	Indigo (Indigofera), blue Hibiscus flowers
4	Red	flame of the forest (*Butea monosperma*), pomegranate, red sandalwood, organic sindoor, beetroot
5	Black	charcoal

4. MAKE YOUR OWN NATURAL COLOURS

To make dry powdered colors mix appropriate amount of food colors with rice flour and water to make a colored paste and then let the paste dry; finally use a grinder to grind and get the powdered color powder. Add to the mixture essential oil and rub the mixture gently together. The combination of ingredients provides a powder having soft and supple touch with good sticking capacities to skin.

To make colored water soak 100 grams of Tesu flowers in a bucket full of water overnight. In the morning you will find the water to be of natural saffron color. One may also use henna leaves instead of Tesu flowers to get colored water.

5. DRAWBACKS OF HERBAL COLOURS

Natural colors have a shorter shelf life, and they will fade in sunlight within few day. Natural blue and green are nearly impossible to do vibrantly, because they come from expensive spirulina algae, and about 10 times as much material is needed for blending into starch to achieve the same brightness seen in an FD&C synthetic dye. Holi colors are produced in India without any quality checks and are sold freely in the market. Even when these are available in a packaged form, there is little information for the consumer about the source of the colors, their contents, and possible toxic effects. In recent years, several nongovernmental organizations have started campaigning for safe practices related to the use of colors. Some are producing and marketing ranges of safer colors derived from natural sources such as vegetables and flowers. We believe that large-scale efforts to increase public awareness regarding the health hazards of harmful colors, widespread availability of safer alternatives at affordable prices, and governmental regulatory control on the production and selling of hazardous chemicals will go a long way in prevention of cutaneous and ocular diseases resulting from the celebration of this vibrant festival [6 & 12].

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When you throw the powder in the air it comes down very slowly, and it looks very nice, but this is an indication that it might have high concentrations of particles under 10 µm, one regulatory threshold below which lung penetration and health effects become a concern. The study by German Federal Environment Agency showed that 40–80% of the particles in the gulal powders had diameters under 10 µm [13 - 17]. The particles also triggered inflammatory responses in cell culture [6 & 18 - 24]. In addition, one powder based on natural dyes tested positive for mold [25]. Some herbal colors require water for processing, and if they are not dried quickly and properly, mold can grow. Use of contaminated starch or wheat flour can further increase the chances of skin or ocular infections.

6. CONCLUSION

Holi festivals - with intense throwing of Holi powder in the air - are becoming popular all over the world. Although adverse health effects like skin, ocular or respiratory irritations may be the consequence, the hazard of Holi powder and possible underlying mechanisms of harmful effects have not been studied so far. We show here that the composition and the observed in vitro effects differ from colour to colour: Holi colours can contain up to 80 % of PM10 particles, they can have a pro-inflammatory and a cytotoxic potential, they can induce a leukocyte oxidative burst and they might be contaminated with mold fungi. These facts may account for some of the observed adverse health effects described by participants of Holi festivals and may improve the risk assessment of Holi colours.

The primary risk which Holi brings along with itself is exposure to harmful chemicals in form of Holi colors. Cheap Holi colors are mostly industrial dyes or oxidized metals mixed with oil. Chemicals such as Lead Oxide, Chromium Iodide, Copper Sulphate, Mercury Sulphite and Aluminium Bromide are widely used in Holi colors to get various color shades. The toxicity from these chemicals are just not harmful for skin and hairs but exposure to them increases the risk of serious health complications such as Bronchial asthma, Renal failure, temporary blindness and much more. The situation becomes more alarming as it is young children who play Holi the most and thus get exposed to these harmful chemicals the most. Add to that later these chemicals cause environmental degradation and pollute ground water and soil. Holi the festival of colors should be fun and harmless and the said can be achieved by celebrating a natural, herbal and organic Holi in proper manner.

7. RECOMMENDATIONS

The Holi festival can only be celebration if the following are adopted

- Do not buy cheap colours available in the market as they are generally industrial dyes.
- Avoid shiny or glittering colours as they contain mica and glass powder.
- Try to prepare natural herbal colours by yourself as the herbal colours available in the market are not certified.
- If preparing herbal colour, take care it is properly dried.
- Avoid throwing of colour powder in the air as the paticle size of gulal is respirable i.e. less than 10µm.
- Use natural liquid colours to play safe holi.

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