



## Phytophotodermatitis: A Case Report

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### ABSTRACT

A rare phototoxic dermatological reaction seen in Indian Sub-continent, known as Phytophotodermatitis, occurs with exposure to ultraviolet light after contact with certain plant chemicals. Phytophotodermatitis named from the terms 'phyto' means plant, 'photo' means light, and 'dermatitis' means skin inflammation. The signs and symptoms of Phytophotodermatitis typically initiated 24 hours after comes in contact with skin, and the peak is reached between 48 to 72 hours. The indications may be from mild or severe. The signs are redness, tenderness, burning sensation, pain, inflammation, itching, blistering, thickened layer of skin after blisters rupture. The area of blisters is usually asymmetrical in shape. These are seen in the areas of the skin, that were exposed to the chemical. For example, the drip form of blister seen in the skin if it is exposed to fruit juice. If the skin were brushed against a plant, it would show streaks like pattern. Though the early symptoms subside, within 7-14 days, signs of blackening of the skin may show hyperpigmentation. This stage of Phytophotodermatitis is known as post-inflammatory pigmentation and might last for many months. In some cases, the affected person will have a very mild inflammatory reaction, if they are exposed to sunlight, while some may not even know that they experienced a reaction. The hyperpigmentation is the initial sign to know that they have got Phytophotodermatitis. Initial symptoms get aggravated because of wet skin, sweat and heat. Darkening of skin-colour is observed in the persons while they are exposed to sunlight. In this case, we are reporting about a patient having this condition and the cause for the occurrence.

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### INTRODUCTION

Phytophotodermatitis arises when someone is exposed to certain plant chemicals and subsequently exposed to sunlight. Warning sign typically ascends after direct contact with the plant, such as, by touching (Marcos and Kahler, 2015). A chemical compound present in many plants and vegetables is sensitive to sunlight. These compounds are known as photosensitizers. Psoralen is one such example of a photosensitizer. Some of the Psoralen containing plants are parsnip, parsley, carrot, celery, fig, citrus

fruits, common rue, South African blister bush plant and meadow grass. A similar type of effect is also seen in some fragrances and plant oils, such as oil of



**Figure 1: Patient's dorsum of legs with skin peeling, erythema and hyperpigmentation**

bergamot if it is exposed to UVA light (Harshman *et al.*, 2017; Janda *et al.*, 2008). Photochemical reactions will be seen if psoralen comes in contact with skin. This leads to injury to skin cells and causes cell death. Regardless of gender, age, or race, their other factors may increase the risk of experiencing Phytophotodermatitis which may include, exposure to individual plants and plant-based products, using perfumes or oils that contain certain plant chemicals and sunny weather (Janda *et al.*, 2008). People engage in a specific type of occupations like farming, gardening, forest rangers, cooking and kitchen staff bartenders, camping, fishing, hiking, outdoor games will have increased the risk for this condition (Harshman *et al.*, 2017).



**Figure 2: Patient's dorsum of hands with skin peeling and hyperpigmentation**

Exposure to ultraviolet light after contact with certain plant chemicals commonly known as furocoumarins. Furocoumarins is formed with a combination of a furan ring and a Benz- $\alpha$ -pyrone coumarin. It is a heterocyclic compound that involves psoralen (linear furocoumarin) and

angelicin (angular furocoumarin) (Bowers, 1999). Furocoumarins are found in plants and vegetables such as limes, celery, carrots and natural grasses (Zhang and Zhu, 2011). One of the significant psoralen derivatives, 8-methoxy psoralen and 5-methoxypsoralen found to cause severe acute phytophotodermatitis reactions. They get excited by the Ultraviolet A (UVA) radiations. The photosensitization reactions that are caused by significant furocoumarins include interactions between psoralens and DNA. The Ultraviolet radiation mainly UVA induces covalent bonding of the psoralen molecule into nuclear DNA producing mono-functional adducts and bifunctional, interstrand cross-links with the pyrimidine bases in DNA. The mono adducts may though produce mutations and cell death. Still, the formation of cross-link enormously increases the effect (Janda *et al.*, 2008). Few dermal conditions like erythema, (Kung *et al.*, 2009; Weber *et al.*, 1999), hyperpigmentation (Moreau *et al.*, 2014; Wynn and Bell, 2005) and vesicle or bullae formation are seen in the patient who gets exposed to such chemical stimulus. (Ahmed and Charles-Holmes, 2000).

#### Case

A 69-year female patient got admitted in a secondary care hospital with complaints of nausea, vomiting, fever on & off and peeling skin, erythema and hyperpigmentation on her face, forearms, dorsum of both hands and legs (Figures 1 and 2). The skin reaction was non-pruritic. The patient also had a concurrent medical condition of Fissure of 6'o clock position with skin tag grade-II haemorrhoids 7', 11'o clock position. On seeking patient history, the patient revealed that she used to farm occasionally in her house courtyard and this time she has farmed carrots and planted lime trees in her ground which she waters and take care of regularly. The patient was treated with Dexamethasone and Chloroquine for her dermatitis, and with Domperidone, liquid Paraffin, Betamethasone ointment for her other condition during the hospital stay and was advised for monthly follow-up visits for three months.

#### DISCUSSION

Phytophotodermatitis a rare phenomenon seen in Indian settings may sometimes get misdiagnosed as fungal skin infection, allergic contact dermatitis or cellulitis (Harshman *et al.*, 2017; Bowers, 1999). Such cases need thorough check-ups and history taking. The dermatologist intervention is a must in such cases. These patients usually visit the health clinic or hospital with mild to moderate

symptoms. In laboratory histopathological findings, cell damage can be observed within 24hrs of the initial insult and followed by clinical signs after 48hrs of UVA exposure. The acute symptoms usually get resolved over days to a week and are self-limiting, while ensuring that the reacting agents are withdrawn. The moderate reactions may require conservative pharmacological therapy. Patients may be counselled to avoid future episodes of such events where he/she gets exposed to such chemical stimulus so that it can be cleansed from the skin with water. The psoralen should get absorbed into the skin before it gets activated by UVA radiation; this process takes around 30 to 120 minutes (Harshman et al., 2017; Janda et al., 2008). These counselling points may be helpful for the patient who are at risk of getting occupational or travel-related exposure.

## CONCLUSIONS

The patient diagnosed with Phytophotodermatitis can be managed with conservative treatment. However, few might require steroids therapy for oedematous eruptions. The correct diagnosis is the utmost requirement to prevent misuse of drugs or misdiagnosis with other skin conditions like dermatitis artifacta. For an accurate diagnosis, the history of the patient plays a vital role, inquiry regarding exposure to psoralen-containing plants, such as limes, celery, or fennel. The patient might require monitoring of secondary infection and patient education should be done to avoid future episodes.

## Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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