Phytophotodermatitis

Rash with many faces

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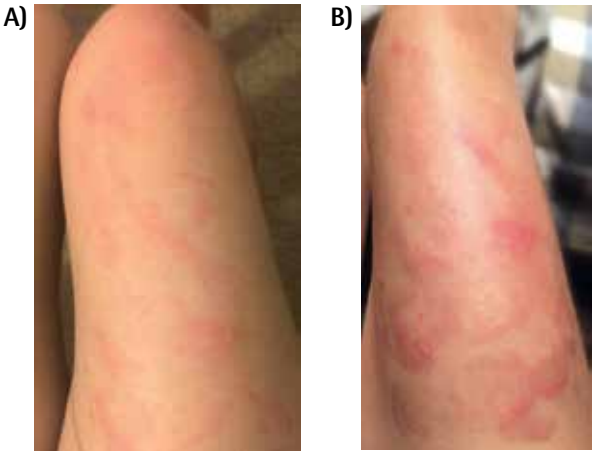
The incidence of phytophotodermatitis is not known. However, with increased numbers of Canadians returning from travel to warmer destinations, family physicians should be aware of this rash and its differential diagnosis. Phytophotodermatitis is a clinical diagnosis and should be suspected when patients present with an irregularly shaped rash and exposure to sunlight and a psoralen-containing substance. Family physicians should be able to diagnose phytophotodermatitis and know when to refer or rule out more serious disorders.

Case

A 27-year-old woman presented with a 7-day history of an unusual rash that started while on vacation in the Dominican Republic. She reported multiple potential exposures including contact with flora and insects, as well as a 5-day history of nonbloody diarrhea after consuming raw fish. Her companion experienced diarrhea as well, but did not develop a rash. She did not have other associated systemic symptoms. On further probing, she had been adding lemon juice to her drinks on the beach.

On examination, she appeared well. The rash on her face consisted of a single linear, hyperpigmented streak on her right cheek. On her arms, she had multiple discrete hyperpigmented macules involving her antecubital fossae, forearms, and the dorsum of her right hand. On her right thigh, the rash was erythematous and linear, with vesicles and bullae (**Figures 1** and **2**).

Figure 1. Patient's right thigh: *A) Early erythematous rash; B) vesicles and bullae.*



Despite multiple potential exposures, we favoured the diagnosis of phytophotodermatitis, given the bizarre appearance of her rash, its nonpruritic nature, the lack of directly associated systemic symptoms, and a history of exposure to lemon juice and sunlight. When the patient added lemon juice to her drink, juice was sprayed onto the hand and arms, resulting in the macular lesions. The linear rashes on her thigh and face were the result of juice transferred from the patient's digits. The intensity of the rash was directly related to the intensity of sun exposure, with blisters developing on the thigh.

At 3 months' follow-up, the blistering had resolved but the patient still had discrete hyperpigmented lesions on her limbs (**Figures 3** and **4**).

Discussion

The differential diagnosis for phytophotodermatitis is broad (**Box 1**).[1-6] Evaluation for the presence of more serious conditions can generally be accomplished

EDITOR'S KEY POINTS

- Phytophotodermatitis is usually nonpruritic and has various appearances; it is often asymmetrically distributed and oddly shaped.
- Diagnosis requires a history of exposure to a psoralen-containing substance and sunlight. Persistent hyperpigmentation is expected and can last weeks to months.
- Family physicians should be familiar with this rash and be comfortable making the diagnosis when patients present in primary care settings.

POINTS DE REPÈRE DU RÉDACTEUR

- La phytophotodermatite ne s'accompagne généralement pas de prurit et revêt divers aspects; elle est souvent répartie de manière asymétrique et prend des formes bizarres.
- Pour poser le diagnostic, il faut connaître les antécédents d'exposition à une substance contenant du psoralène et au soleil. On peut s'attendre à une hyperpigmentation persistante qui peut durer des semaines, voire des mois.
- Les médecins de famille devraient se familiariser avec ce genre d'éruption cutanée et se sentir à l'aise de poser ce diagnostic lorsque des patients se présentent en milieu de soins primaires.

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Figure 2. Macular rash seen on the patient's right antecubital fossa

Figure 3. Hyperpigmentation on the patient's right thigh following the acute rash

through a detailed history and physical examination, along with other investigations if needed.

In the case presented, the differential diagnosis included contact dermatitis, polymorphic light eruption, and an infectious exanthem. Contact dermatitis is a pruritic rash appearing after contact with an irritating substance. Polymorphic light eruption occurs in a symmetrical fashion in areas of prolonged sun exposure—typically the arms, back of the hands, neck, chest, lower legs, and feet; the face is usually spared. Infectious exanthem can have a varied presentation; however, the lengthy timeline of the rash and the companion with diarrhea and no rash made this less likely.

A PubMed literature search using the key words *phytophotodermatitis, travel and dermatitis, pathophysiology of phytophotodermatitis*, and *lime dermatitis* was completed. Search results consisted predominantly of case reports from 1980 to 2015. Most reports are published in dermatology or pediatric journals; few have been written from the perspective of family physicians.

Phytophotodermatitis is a rash occurring after contact between the skin and furanocoumarins, a class of chemicals found in many plants.[2,4] **Box 2** lists plants and fruits associated with phytophotodermatitis.[1-3]

The active substance within the furanocoumarins is psoralen,[2,4] which reacts with UVA light to cause an intense cutaneous reaction. Phytophotodermatitis does not involve any immune mechanism but must be differentiated from an allergic response.[7] At a histologic level, cell damage is first detectable at 24 hours after the initial insult; clinical signs can be identified 48 hours after

Figure 4. Hyperpigmentation on the patient's right hand

UVA exposure.[1,7] The acute dermatitis is self-limited and resolves over a period of days to weeks, but the ensuing hyperpigmentation, caused by psoralen-stimulated melanin hyperproduction, can last weeks to months.[1,2]

The phytophotodermatitis reaction is highly variable. Rash characteristics can range from simple hyperpigmentation to erythema, vesicles, or bullae.[1,2] The variability

Box 1. Differential diagnosis of phytophotodermatitis

Severe burns[1]
Polymorphic light eruption
Drug-related photosensitivity[2,3]
- Certain antibiotics (eg, doxycycline)
- Antifungal agents
- Phenothiazines
- Isotretinoin
- Nonsteroidal anti-inflammatory drugs
- Chlorothiazide diuretics
- Sulfonylureas
- Amiodarone

Nonaccidental trauma[1,4,5]
Herpes simplex[2,5]
Contact dermatitis (eg, poison ivy)[3]
Lyme disease[1]
Cutaneous larva migrans[6]
Jellyfish stings
Superficial lymphangitis[6]
Collagen-vascular diseases[3]

Box 2. Plants and fruits commonly associated with phytophotodermatitis

The following are commonly associated with phytophotodermatitis:
- Bergamot
- Buttercup
- Capsaicin (peppers)
- Celery
- Carrots
- Citrus fruits (especially lemons and limes)
- Dill
- Fennel
- Fig
- Hogweed
- Mustard
- Parsley
- Parsnip

Data from Weber et al,[1] Moreau et al,[2] and Wynn and Bell.[3]

is dependent on the quantity of photosensitizing agent, the length of exposure,[8] the type of psoralen-containing substance,[2,5] and the method of contact.[1,2] For this reason, practitioners might believe the rash has more than one cause. One case report documented a leg rash that was consistent with the shape of the patient's palm and fingertips.[2] The rash has also been confused with nonaccidental trauma.[1,4,5] Usually, the rash is nonpruritic; pruritus should prompt consideration of other diagnoses.[3]

Treatment is sometimes pursued; however, there is limited evidence on efficacy. Severe bullous reactions and resulting wounds should be managed with standard care to prevent secondary infection.[8] In some cases, physicians might choose to prescribe topical steroids[1,3] or antihistamines,[3] or advise the use of cold compresses[1] for relief of pain or itching. Evidence for these treatments is based on expert opinion. While the rash might be aesthetically disturbing to patients, reassurance is often all that is needed.[2]

Patients can be counseled on prevention. If an exposure can be identified early, the chemical stimulus can be cleansed from the skin with water. Psoralen must be absorbed into the skin before activation by UVA light, a process that can take anywhere between 30 and 120 minutes.[2] This knowledge might be useful for patients with occupational or travel-related exposures. Not all sunscreens are helpful in preventing the rash, as some sunscreens only protect against UVB light.[9]

Conclusion

A clinical diagnosis of phytophotodermatitis was made with referral to a dermatologist for confirmation. However, as the patient's symptoms were resolving, she did not follow up with the dermatologist. (For the purpose of this report, a dermatologist reviewed the photos.) We encourage family practitioners to be familiar with this rash for easier recognition in clinical practice.

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Competing interests
None declared

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References

1. Weber IC, Davis CP, Greeson DM. Phytophotodermatitis: the other "lime" disease. *J Emerg Med* 1999;17(2):235-7.
2. Moreau JF, English JC III, Gehris RP. Phytophotodermatitis. *J Pediatr Adolesc Gynecol* 2014;27(2):93-4.
3. Wynn P, Bell S. Phytophotodermatitis in grounds operatives. *Occ Med* (Lond) 2005;55(5):393-5.
4. Bosch JJ. Phytophotodermatitis. *J Pediatr Health Care* 1997;11(2):84, 97-8.
5. Carlsen K, Weismann K. Phytophotodermatitis in 19 children admitted to hospital and their differential diagnoses: child abuse and herpes simplex virus infection. *J Am Acad Dermatol* 2007;57(5 Suppl):S88-91.
6. Ahmed I, Charles-Holmes R. Phytophotodermatitis mimicking superficial lymphangitis. *Br J Dermatol* 2000;142(5):1047-70.
7. Jorge VM, Almedia HL Jr, Amado M. Serial light microscopy of experimental phytophotodermatitis in animal model. *J Cutan Pathol* 2009;36(3):338-41. Epub 2008 Nov 19.
8. Mioduszewski M, Beecker J. Phytophotodermatitis from making sangria: a phototoxic reaction to lime and lemon juice. *CMAJ* 2015;187(10):756.
9. Deleo VA. Photocontact dermatitis. *Dermatol Ther* 2004;17(4):279-88.