Shiitake Mushroom Dermatitis

To the Editor:

The shiitake mushroom (*Lentinula edodes*) is a popular Asian food and represents the second most consumed mushroom in the world. It is known for having a range of strong health benefits including antihypertensive, anti-inflammatory, and immunomodulatory effects. Especially in Asia, this mushroom has been used in patients with cancers of the gastrointestinal tract and also may be helpful in the treatment of human immunodeficiency virus.[1,2] The source of these effects is lentinan, a polysaccharide in the mushroom. However, lentinan also can cause a toxic reaction of the skin when the mushrooms are eaten raw or undercooked. These reactions are mainly reported in Asia, but more cases have been published in the last decade in Europe and the United States, evidence that the incidence of this adverse effect has increased in the Western world.

A 65-year-old woman with no notable medical history presented to our outpatient practice with sudden onset of a pruritic, erythematous, papular eruption on the neck. The eruption began that morning. The diagnosis of eczematous dermatitis was made and hydrocortisone cream 2.5% was started. Three days later, she returned with spread of the rash to the trunk, arms, and legs despite the topical treatment. She denied fevers, chills, or constitutional symptoms. The patient also denied recent travel or bug bites. However, she reported that she recently had started using raw shiitake mushrooms in her salad; the first time was 3 days before the symptoms appeared. Physical examination revealed erythematous skin with long flagellate streaks composed of petechiae, papules, and vesicles involving the trunk, arms, and legs (Figure). Oral and nasal mucosae were uninvolved. Dermatographism was negative. The diagnosis of flagellate dermatitis from shiitake mushrooms was made given the patient's history and the unique clinical findings of the skin. Blood work and a biopsy were not performed. Instead, the patient was advised to avoid shiitake mushrooms and use clobetasol propionate cream 0.05% twice daily for 2 weeks on the affected areas. The symptoms resolved within 10 days.

The first known case of toxicoderma to shiitake mushrooms was reported in Japan by Nakamura[3] in 1977. Since this seminal report, numerous cases have followed. This disorder is mainly seen in Asia.

Patients usually present with linear groups of pruritic, papular, petechial, and vesicular lesions in a flagellate pattern, most commonly localized on the trunk, arms, and legs. Oral and nasal mucosae usually are not involved, and fever and malaise may be associated.

Erythematous flagellate streaks composed of petechiae, papules, and vesicles localized on the patient's back (A) and right upper arm (B) associated with shiitake mushroom consumption.

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All symptoms typically occur 1 to 2 days after ingestion of the mushrooms. The patient's history and typical clinical findings lead to a diagnosis; however, blood tests may show inflammation with leukocytosis and elevated C-reactive protein levels. Biopsy of the skin shows lymphocytic dermal infiltrates with spongiosis and necrotic cells within the epidermis.[4]

Differential diagnoses include flagellate dermatitis associated with bleomycin, a glycopeptide antibiotic produced by the bacterium *Streptomyces verticillus*. Because it causes breaks in the DNA, bleomycin is commonly used as a chemotherapeutic agent in treating Hodgkin lymphoma and other malignancies. It presents with linear postinflammatory hyperpigmentation of the skin. However, unlike shiitake dermatitis, there is a lack of papules. Another differential diagnosis includes herpes zoster virus, which should be ruled out clinically.

All symptoms in shiitake dermatitis usually resolve within 1 to 8 weeks of avoidance of the culprit food. Topical steroids and antihistamines can be given.

The underlying pathology is a toxic reaction to the polysaccharide lentinan in the mushrooms, which is known as a thermolabile agent.[5] Therefore, it may only cause a toxic reaction when the mushrooms are consumed raw or undercooked. Prick testing is usually negative in these patients, which suggests a toxic and not an immunologic reaction of the human body.[6] Other forms of reaction to shiitake mushrooms include contact dermatitis after skin contact and allergic alveolitis after occupational exposure to mushroom spores, mainly in individuals cultivating shiitake mushrooms (mushroom worker's lung). In these forms of the disease, prick testing may be positive.[7,8]

Flagellate dermatitis caused by shiitake mushrooms is still an uncommon dermatologic phenomenon in the Western world. Future studies and cases should be reported to increase the awareness of this disorder. Although the patients present with typical clinical findings, the diagnosis can be missed if history is not carefully considered.

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