



Letter

Boletus dermatitis

A new variant of flagellate erythema

A 56-year-old patient presented with itchy skin lesions that had reportedly appeared overnight. She recalled having eaten grilled mushrooms in an Italian restaurant 3 days ago. The patient did not take any medication, had no history of atopic or allergic diseases, and was otherwise in good health. In particular, she did not have fever, lymphadenopathy, muscle weakness, or symptoms that were indicative of systemic autoimmune disease. On inquiry, the restaurant's cook insisted that exclusively porcini (ie, boletus) mushrooms had been used for the dish in question. Physical examination revealed whiplash-shaped, erythematous plaques arranged in parallel on the trunk and extremities. On therapy with class 3 topical glucocorticosteroids, lesions cleared within a few days.

Skin prick testing with standard aeroallergens revealed an immediate type reaction to cat dander only. Prick-to-prick testing with different species of mushrooms elicited late-type reactions with crescendo dynamics after 48 hours with shiitake mushrooms, boletus mushrooms, and king oyster mushrooms.

A lymphocyte transformation test (LTT) with peripheral blood mononuclear cells from the patient and 2 unaffected controls revealed an antigen-specific stimulation of the lymphocyte proliferation by extracts from all 3 mushroom species. To exclude unspecific mitotic effects of the extracts, serial extract dilutions had been used for stimulation, and subsequently the concentration range with the lowest background mitotic activity was used (Fig 1).

Histopathologic analysis revealed orthohyperkeratosis with focal parakeratosis overlying a largely normal epidermis. A predominantly perivascular mixed infiltrate containing lymphocytes, histiocytes, and eosinophils was apparent in the upper and middle dermis. Periodic acid–Schiff staining revealed no fungal elements. Laboratory testing revealed slightly elevated eosinophil counts (5.6%; reference range, <4%), C-reactive protein levels (1.41 mg/dL; reference range, <0.05), and normal total IgE level (16 kU/L; reference range, <100 kU/L).

The typical whiplashlike skin lesions of flagellate erythema (from the Latin word *flagellum*, meaning scourge) have been reported predominantly from Asia in the context of consumption of shiitake mushrooms (*Lentinula edodes*), henceforth the synonym shiitake dermatitis.¹ Similar skin lesions have also been reported as a cutaneous adverse effect of chemotherapy with bleomycin, peplomycin, or docetaxel or in the context of dermatomyositis and systemic lupus erythematosus.^{2–5} The pathogenesis of flagellate erythema is largely unclear. Toxic reactions to the polysaccharide lentinan (a natural ingredient of the mushroom) have been discussed along with koebnerization by scratching or UV-A photoprovoke.^{1,6} Only a few positive reactions to skin prick testing have been reported.^{7,8} Allergic contact dermatitis affecting the hand and face have been observed in shiitake mushroom growers,⁷

and positive patch test results to different parts of the fungus have been reported recently.⁹ Flagellate erythema in response to mushrooms other than shiitake has not been reported so far. Our case is the first with a reaction to boletus mushrooms. The late-type reaction to skin prick testing with extracts of boletus, shiitake, and one other mushroom species suggests that there might be an antigen responsible for flagellate erythema that is shared by several mushroom species. This is supported by the observation that similar skin lesions can be triggered by chemotherapeutics derived from fungi. We further assessed the potential specific hyperreactivity of the patient's lymphocytes to the fungal antigens by use of an LTT. The mushroom extracts might contain a variety of contaminants (eg, polysaccharides, such as lipopolysaccharide, with unspecific mitotic activity).¹⁰ Thus, serial dilutions of extracts and comparison with control patients were used to optimize the LTT. The specific mitogenic reactivity of the patient's lymphocytes lends further support to the hypothesis of an allergic reaction to a fungal antigen as basis of flagellate erythema.

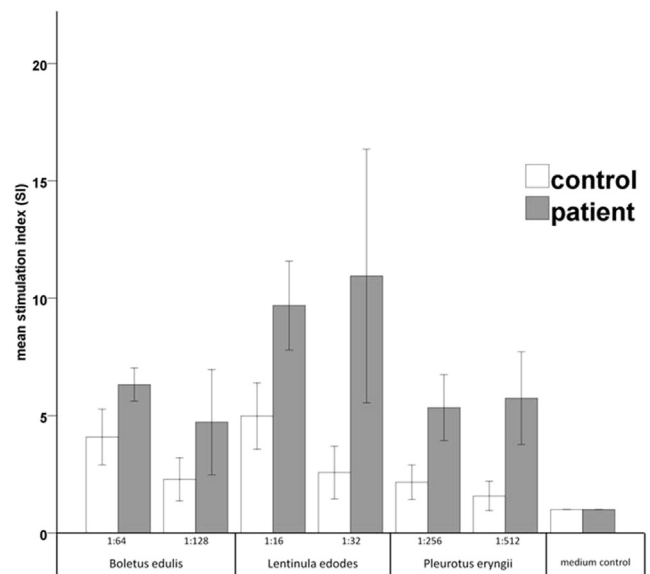


Figure 1. Mitogenic response of peripheral blood mononuclear cells containing lymphocytes of the patient and 2 healthy controls to extracts from different mushrooms: shiitake (*Lentinula edodes*), boletus (*Boletus edulis*), and king oyster mushrooms (*Pleurotus eryngii*). After incubation with fungal extracts (the 2 concentrations with lowest unspecific mitotic effect) or mock buffer, lymphocytes from the patient and unaffected controls were labeled with 3H-thymidin. Stimulation index represents thymidine incorporation with fungal extract and thymidine incorporation with cell culture medium alone. Experiments were performed in quadruplicate; mean (SD) is indicated.

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