

***Rhizopus*-induced hypersensitivity pneumonitis in a tractor driver**

Michael A. O'Connell, MD,^a Jerry L. Pluss, DO,^b Paul Schkade, MD,^a
Anthony R. Henry, MD,^a and David L. Goodman, MD Aurora, Colo.

Acute hypersensitivity pneumonitis caused by *Rhizopus* species has been best described in Scandinavian sawmill workers (Woodtrimmer's disease).^{1,2} The fungus grows on the cut surface of wood and is aerosolized by trimming of the wood into specific-size pieces. A chronic form of Woodtrimmer's disease manifested by progressive dyspnea and development of a restrictive ventilatory defect has recently been described.³ However, *Rhizopus* has not been reported as a cause of hypersensitivity pneumonitis in the farm environment. We report a farmer who was first seen with chronic hypersensitivity pneumonitis in which only serum precipitins to *Rhizopus* were found. The source of the *Rhizopus* was contamination of his enclosed-cab farm tractor air-conditioning system, which then delivered a continuous fungal aerosol to the driver.

CASE REPORT

A previously healthy 49-year-old male farmer was first seen with a 5-month history of progressive dyspnea, fatigue, and a nonproductive cough. The onset of symptoms was indolent without fever, chills, or acute episodes of dyspnea. His local physician ordered a chest radiograph, which showed bilateral diffuse interstitial infiltrates (Fig. 1). He was subsequently referred from his North Dakota farm to our institution for a diagnostic evaluation. Our workup included a chest computed tomographic scan, which confirmed the presence of a diffuse interstitial process without evidence of hilar lymphadenopathy or mediastinal masses. Complete blood count with differential was normal without evidence of eosinophilia. Room air arterial blood gases at the time of admission showed pH 7.48, P_{aCO_2} 28 mm Hg, and P_{aO_2} 55 mm Hg. Pulmonary function testing showed a total lung capacity of 5.74 L (85% predicted), functional residual

capacity of 3.11 L (80% predicted), residual volume of 1.92 (100% predicted), forced vital capacity of 3.97 L (82% predicted), forced expiratory volume in 1 second of 3.19 (82% predicted), and carbon monoxide diffusion in the lungs of 20.02 ml/min/torr (67% predicted). Bronchoscopy with bronchoalveolar lavage (BAL) was performed and showed normal gross anatomy. Results of BAL fluid cultures for bacteria, fungi, and mycobacteria were negative. BAL fluid cell count showed 48% alveolar macrophages, 28% lymphocytes, 14% neutrophils, and 6% eosinophils. The patient exercised by using a Bruce protocol,⁴ which showed arterial oxygen desaturation from 91% at baseline to 85% after 4½ minutes. Open lung biopsy demonstrated a marked interstitial lymphocytic infiltrate with occasional epithelioid granulomata (Fig. 2). Of note, while the patient was hospitalized undergoing evaluation (i.e., removed from the farm environment for 14 days), his dyspnea subjectively decreased and his P_{aO_2} as determined by room air arterial blood gases increased to 65 mm Hg without therapy. On the basis of this information, a presumptive diagnosis of chronic farmer's lung was made. However, analysis of the patient's serum by Ouchterlony double immunodiffusion did not reveal precipitins to common thermophilic actinomycetes including (*Thermoactinomyces vulgaris* and *Micropolyspora faeni*). The patient was started on a regimen of prednisone 60 mg by mouth daily for a 2-month empirical trial, and site sampling was done at his North Dakota farm. Cultures taken in his barn and silo showed dominant growth of *Rhizopus* species. Cultures obtained from gross contamination of an enclosed-cab farm tractor air-conditioning system resulted in luxuriant growth of *Rhizopus* species. As determined by history, our patient spent little time in the barn or silo but had actively participated in fall plowing shortly before his symptoms began. Ouchterlony double immunodiffusion showed striking precipitin bands in response to a *Rhizopus* extract made from the culture plate colonies. Per our recommendation, he left his farm and now lives in a local town. At a 1-year follow-up visit, carbon monoxide diffusion in the lungs had returned to normal, and room air P_{aO_2} was 62 mm Hg. Repeat BAL was performed; and fluid analysis showed 85% alveolar macrophages, 8% lymphocytes, 2% neutrophils, 2% eosinophils, and 2% mast cells. He was now able to exercise 9 minutes on a Bruce protocol before arterial oxygen desaturation occurred.

From ^aAllergy-Immunology Service and ^bPulmonary Disease Service, Fitzsimons Army Medical Center, Aurora, Colo.

Supported by US Army research funds.

Reprint requests: Michael A. O'Connell, MD, Allergy-Immunology Service, HSHG-MDA, Fitzsimons Army Medical Center, Aurora, CO 80045-5001.

J ALLERGY CLIN IMMUNOL 1995;95:779-81.

1/54/61003

DISCUSSION

The most common hypersensitivity pneumonitis occurring in the farm environment is farmer's lung, which is classically caused by exposure to various thermophilic actinomycetes that grow in hay, compost, and silage.⁵ *Rhizopus* species have been recovered from site samples taken from farm barns in Pennsylvania, but it is a subdominant species in the farm environment.⁶ To our knowledge, *Rhizopus* species have not been previously reported as a cause of occupational lung disease in the farm environment. In this patient, we propose that the tractor air-conditioning system became contaminated with *Rhizopus* species from the surrounding environment. Once contaminated, the enclosed-cab tractor provided an ideal closed system for circulation of high concentrations of airborne fungi, similar to the environment encountered by Swedish sawmill workers.

This case illustrates the value of a site visit in the diagnosis of occupational lung disease. Contami-

nated ventilating systems in enclosed-cab farm equipment should be considered as sources of unusual antigens in cases of farmer's lung.

REFERENCES

1. Belin KWL. Recognition of allergic alveolitis in the trimming department of a Swedish sawmill. *Eur J Respir Dis* 1980;61(Suppl):163-7.
2. Belin L. Clinical and immunologic data on "Wood-trimmer's disease" in Sweden. *Eur J Respir Dis* 1980;61(Suppl):169-76.
3. Alexandersson R. Exposure, lung function and *Rhizopus* antibodies in wood trimmers. A longitudinal study. *Arh Hig Rada Toksikol* 1988;39:405-9.
4. Bruce RA. Exercise testing of patients with coronary artery disease. *Ann Clin Res* 1971;3:323-32.
5. Fink JN. Hypersensitivity pneumonitis. In: Middleton E Jr, Reed CE, Ellis EF, Adkinson NF Jr, Yunginger JW, Busse WW, eds. *Allergy: principles and practice*. 4th ed. St. Louis: Mosby 1993:1415-31.
6. Halliwell RE, Fleischman JB, Mackay-Smith M. The role of allergy in chronic pulmonary disease of horses. *J Am Vet Med Assoc* 1979;174:277-81.

Vaginal itching as a manifestation of seasonal allergic disease

Amrit K. Dhaliwal, MD, and Jordan N. Fink, MD Milwaukee, Wis.

Vaginal pruritus as a manifestation of IgE mast cell-mediated disease has rarely been reported in women^{1,2} and not in children. We herein report the first case of putative ragweed-induced vaginitis in a child.

CASE REPORT

The patient is now 10 years old and was first seen in the Allergy-Immunology Clinic of the Medical College of Wisconsin in April 1989. She was then seen with classical allergic rhinitis, which occurred during the

previous year from June through October and after exposure to dogs. There was a strong family history of atopy. She had physical findings of atopic respiratory disease and marked immediate wheal-and-flare skin reactivity to common inhalant antigens, including grass and ragweed. She began receiving antihistamines and had a good response. In August 1989 she began to wheeze and began receiving bronchodilator syrup intermittently. Observation and pharmacologic management were chosen as therapy, and her condition was under good control.

In August 1991 she had nasal and eye symptoms and, for the first time, vaginal pruritus, which led to excoriations and emotional upsets. Maximum use of antihistamines did not provide relief of the pruritus, which became more severe. Daily use of prednisone with tapering to 10 mg every other day through the remainder of the ragweed pollination season resulted in total relief of her vaginal symptoms.

She then did well with intermittent administration of antihistamines and decongestants until August of 1992, when the intense vaginal pruritus began again, along

From the Allergy-Immunology Division, Departments of Medicine and Pediatrics, the Medical College of Wisconsin, Milwaukee.

Reprint requests: Jordan N. Fink, MD, Allergy-Immunology Division, Departments of Medicine and Pediatrics, Medical College of Wisconsin, 9000 West Wisconsin Ave., Milwaukee, WI 53226.

J ALLERGY CLIN IMMUNOL 1995;95:781-2.

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0091-6749/95 \$3.00 + 0 1/54/62023