

Histoplasmosis in Idaho and Montana, USA, 2012–2013

Randall J. Nett, Donald Skillman, Laurel Riek, Brian Davis, Sky R. Blue, Elizabeth E. Sundberg, Joel R. Merriman, Christine G. Hahn, Benjamin J. Park

Author affiliations: Montana Department of Public Health and Human Services, Helena, Montana, USA (R.J. Nett, J.R. Merriman); Centers for Disease Control and Prevention, Atlanta, Georgia, USA (R.J. Nett, B.J. Park); St. Peter's Medical Group, Helena (D. Skillman); Lewis and Clark City-County Health Department, Helena (L. Riek); Billings Clinic, Billings, Montana (B. Davis); Sawtooth Infectious Diseases, Boise, Idaho, USA (S.R. Blue); Holy Rosary Healthcare, Miles City, Montana (E.E. Sundberg); Idaho Department of Health and Welfare, Boise (C.G. Hahn)

DOI: <http://dx.doi.org/10.3201/eid2106.141367>

To the Editor: Histoplasmosis occurs after infection with the dimorphic fungus *Histoplasma capsulatum* (1–6). Patients become ill after they inhale soil contaminated with *H. capsulatum* (1,2). Most infections are asymptomatic or result in mild illness not determined to be histoplasmosis

(1,2). Symptoms usually develop 3–14 days after exposure and range from self-limited pneumonia to severe disseminated disease requiring antifungal therapy (2,7).

In the United States, *H. capsulatum* is endemic to the Mississippi and Ohio River Valleys (1,2,5,8) but is not known to be endemic to the Rocky Mountain region (8). During June 2012–November 2013, a total of 6 unrelated cases of histoplasmosis were reported in Idaho (n = 1) and Montana (n = 5) in patients who had no recent travel to recognized *H. capsulatum*-endemic regions. Public health authorities investigated the illnesses by reviewing medical records and collecting exposure and travel histories.

The median age of the patients (3 male, 3 female) was 68 (range 17–79) years (Table). Each case was diagnosed by a different physician; no known epidemiologic links existed among the patients. Five patients had ≥ 1 immunocompromising conditions (Table), and 2 had acute pneumonia; 1 each had left parotid gland enlargement, anterior cervical lymphadenopathy, tricuspid valve mass, and acute changes in mental status. Three patients were hospitalized: 2 required intensive care, and 1 died.

Histoplasmosis was diagnosed primarily on the basis of culture (n = 2), urine enzyme immunoassay (EIA) (n = 2), and histopathologic examination (n = 2) results; histopathologic examinations were conducted by 2 pathologists

Table. Characteristics of 6 persons with histoplasmosis, Idaho and Montana, USA, 2012–2013*

Characteristic	Value
Sex	
M	3 (50)
F	3 (50)
Median age, y (range)	68 (17–79)
Location of residence	
Idaho, southwestern	1 (17)
Montana	
Eastern	2 (33)
Southwestern	3 (50)
Immunocompromising condition, n = 5†	
Diabetes mellitus, type 2	3 (50)
Hepatitis C	1 (17)
Previous history of breast cancer	1 (17)
Acute mononucleosis	1 (17)
Previous history of colon cancer	1 (17)
Hospitalization	3 (50)
Death	1 (17)
Tests with positive results that contributed to histoplasmosis diagnosis	
Culture	2 (33)
Histopathology‡	2 (33)
Urine enzyme immunoassay‡	2 (33)
Diagnosis delayed >6 mo	3 (50)
At-risk activities	
Using potting soil containing bat guano	1 (17)
Exploring caves	1 (17)
Mowing grass in pasture	1 (17)
Cleaning pigeon cages	1 (17)
Traveling to an area where the disease is endemic <3 y of illness onset	0
None known	2 (33)

*Values are no. (%) patients except as indicated.

†One patient had diabetes mellitus type 2 and hepatitis C; 1 patient had diabetes mellitus type 2 and a previous history of colon cancer.

‡One patient with a culture positive for *Histoplasma capsulatum* also had histopathology and urine enzyme immunoassay results consistent with *H. capsulatum* infection (results not shown).

(online Technical Appendix Table, <http://wwwnc.cdc.gov/EID/article/21/6/14-1367-Techapp1.pdf>). One patient with *H. capsulatum*-positive cultures also had positive results by histopathology, serum antigen detection, and urine EIA. Another patient with positive urine EIA results for antigen detection also had low serum levels of *Histoplasma* antibodies measured by complement fixation. No patient samples were tested by PCR.

The interval between a patient's initial visit to a health care provider and diagnosis ranged from 1 week to 20 months. Diagnosis was delayed >6 months for 3 patients. For 2 patients, a diagnosis was made on the basis of an *H. capsulatum*-positive urine EIA result <4 weeks from illness onset. Four (67%) patients underwent surgical procedures before histoplasmosis was diagnosed.

Each patient reported having traveled to *H. capsulatum*-endemic places, but none had traveled to these areas within 3 years of illness onset. Four patients reported exposures possibly related to infection (1 patient each): handling bat guano-containing potting soil manufactured in California, exploring caves, mowing pasture grass, and cleaning pigeon cages. The exposure to potting soil occurred in California; the other 3 exposures occurred in Montana. Two patients had no identifiable high-risk exposures to *H. capsulatum*.

These 6 patients with histoplasmosis represent potential acute infections and suggest that *H. capsulatum* might exist in Idaho and Montana, a geographic area farther west than areas where the fungus is known to be endemic. Areas of contaminated soils exist in microfoci outside recognized *H. capsulatum*-endemic areas and can be the source of infection for some persons (6). Previous studies suggest that the *H. capsulatum*-endemic area might extend into Montana and possibly other states in the Rocky Mountain region (8–10). Further environmental studies are needed to determine with certainty whether *H. capsulatum* fungi exist in natural environments in the Rocky Mountain region.

Delayed diagnosis of histoplasmosis increases the likelihood of delays in administering effective antifungal therapy. Histoplasmosis was diagnosed in 3 of these patients >6 months after they first sought care, probably because they had reported no recent travel to *H. capsulatum*-endemic areas. Among these 3 patients, none had urine EIA testing for the presence of *H. capsulatum* antigen. The 2 patients who received a diagnosis of histoplasmosis <4 weeks after they first sought care were assessed by using urine EIA. Urine EIA is a noninvasive and sensitive assay with high specificity but is subject to false-positive results in patients with other fungal infections, particularly blastomycosis (6), which is not known to be endemic in Montana or Idaho.

Investigation of these 6 histoplasmosis cases was limited because only 2 patients had cultures positive for *H. capsulatum*, and each patient had a remote travel history

(≥3 years before infection) to an *H. capsulatum*-endemic area. These limitations raise the possibility that the cases represent reactivation of latent disease or delayed clinical manifestations following a low-inoculum exposure years earlier in an area where the fungus is endemic (2,6). However, data supporting the possibility that reactivation of latent *H. capsulatum* infection causes acute illness are inconclusive (6).

In summary, health care providers should consider a diagnosis of histoplasmosis for Idaho and Montana residents having symptoms consistent with the disease, regardless of whether they have a travel history to recognized *H. capsulatum*-endemic areas. When considering a diagnosis of histoplasmosis, providers should also consider testing with urine EIA, a noninvasive way to assess the presence of *H. capsulatum* infection.

Acknowledgments

We thank Brenda Eberling, Noel Mathis, Nancy Iversen, Julie Brodhead, and Cindia Miller for their assistance in case investigations and Julie Harris for her guidance during the investigative process.

References

1. Kauffman CA. Endemic mycoses: blastomycosis, histoplasmosis, and sporotrichosis. *Infect Dis Clin North Am.* 2006;20:645–62. <http://dx.doi.org/10.1016/j.idc.2006.07.002>
2. Kauffman CA. Histoplasmosis: a clinical and laboratory update. *Clin Microbiol Rev.* 2007;20:115–32. <http://dx.doi.org/10.1128/CMR.00027-06>
3. Kauffman CA. Histoplasmosis. *Clin Chest Med.* 2009;30:217–25. <http://dx.doi.org/10.1016/j.ccm.2009.02.002>
4. McKinsey DS, McKinsey JP. Pulmonary histoplasmosis. *Semin Respir Crit Care Med.* 2011;32:735–44. <http://dx.doi.org/10.1055/s-0031-1295721>
5. Smith JA, Kauffman CA. Pulmonary fungal infections. *Respirology.* 2012;17:913–26. <http://dx.doi.org/10.1111/j.1440-1843.2012.02150.x>
6. Wheat LJ. Histoplasmosis: a review for clinicians from non-endemic areas. *Mycoses.* 2006;49:274–82. <http://dx.doi.org/10.1111/j.1439-0507.2006.01253.x>
7. Wheat LJ, Freifeld AG, Kleiman MB, Baddley JW, McKinsey DS, Loyd JE, et al. Clinical practice guidelines for the management of patients with histoplasmosis: 2007 update by the Infectious Diseases Society of America. *Clin Infect Dis.* 2007;45:807–25. <http://dx.doi.org/10.1086/521259>
8. Baddley JW, Winthrop KL, Patkar NM, Delzell E, Beukelman T, Xie F, et al. Geographic distribution of endemic fungal infections among older persons, United States. *Emerg Infect Dis.* 2011;17:1664–9. <http://dx.doi.org/10.3201/eid1709.101987>
9. Chu JH, Feudtner C, Heydon K, Walsh TJ, Zaoutis TE. Hospitalizations for endemic mycoses: a population-based national study. *Clin Infect Dis.* 2006;42:822–5. <http://dx.doi.org/10.1086/500405>
10. Edwards LB, Acquaviva FA, Livesay VT, Cross FW, Palmer CE. An atlas of sensitivity to tuberculin, PPD-B, and histoplasmin in the United States. *Am Rev Respir Dis.* 1969;99 Suppl:1–132.

Address for correspondence: Randall J. Nett, Montana Department of Public Health and Human Services, 1400 Broadway, Cogswell Bldg, Rm B201, Helena, MT 59620, USA; email: gge5@cdc.gov