

## *Cryptococcus gattii* in BC: Update on an emerging disease

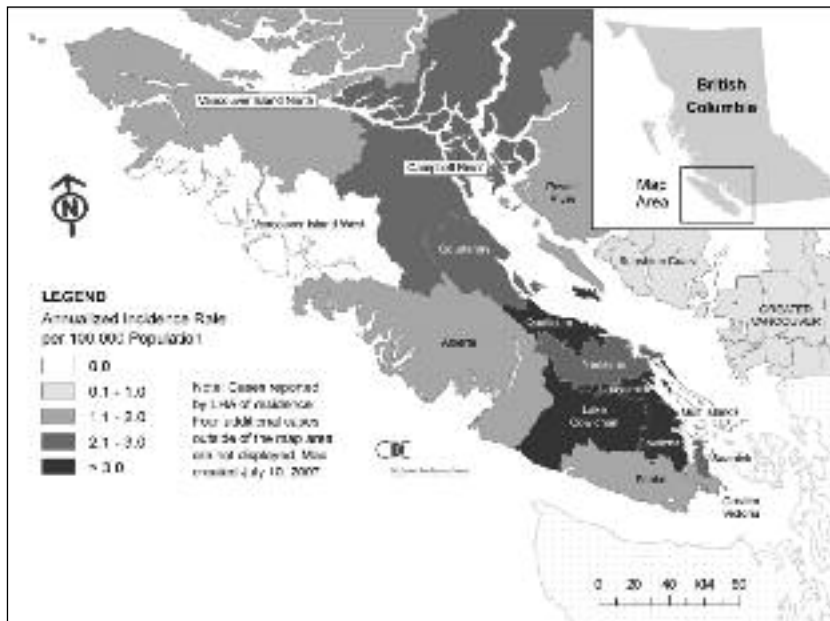
**C***ryptococcus neoformans* variety *gattii* (herein referred to as *C. gattii*) emerged for the first time in a region with a temperate climate on Vancouver Island, British Columbia, in 1999.<sup>1</sup> *C. gattii* is an environmental fungus that causes infection through inhalation of its spores. In BC, it has been found throughout the east coast of Vancouver Island, where it has been isolated from multiple tree species, soil, water, and air.<sup>2</sup>

Between 1999 and 2006, 176 cases of *C. gattii* infection were reported among BC residents.<sup>3</sup> Approximately 27 cases were reported every year for an average annual incidence rate of 6.5 cases per million in BC and 27.9 cases per million on Vancouver Island in 2002–06. The mean age of those infected with *C. gattii* during this period was 59 years (range 2–92 years) and 55% were male. Only two cases occurred in children. The incubation period has been estimated as 6 weeks to 11 months.<sup>4,5</sup>

The majority of those infected resided on or traveled to Vancouver Island in the year prior to the onset of symptoms (Figure). Since 2004, six cases of *C. gattii* infection were reported among BC mainland residents who did not travel to Vancouver Island or other endemic areas in the years prior to onset and are thought to have acquired their infection in the Lower Mainland.<sup>6</sup>

Unlike *C. neoformans* var. *grubii* and var. *neoformans*, *C. gattii* infects mostly immunocompetent persons. Although *C. gattii* leads to similar clinical presentations as other varieties, it is less likely to cause disseminated or central nervous system (CNS) disease but more likely to form cryptococcomas.<sup>7</sup>

Most BC *C. gattii* patients present with pulmonary infection. Common presenting symptoms include cough,



**Figure.** *Cryptococcus gattii* incidence in southwestern British Columbia by local health area, 1999–2006.

**Common presenting symptoms include cough, dyspnea, chest pain, and weight loss. Radiological findings include lung cryptococcomas, infiltrates, and cavitory lesions.**

dyspnea, chest pain, and weight loss. Some individuals with pulmonary infection are asymptomatic. Radiological findings include lung cryptococcomas, infiltrates, and cavitory lesions. Individuals presenting with CNS infection most often have meningitis with or without brain cryptococcomas. Common symptoms include headache, fever, night sweats, and weight loss. To date, eight people have died of cryptococcosis (case fatality rate = 4.5%).

Serum antigen detection, microscopy of respiratory or cerebrospinal

fluid (CSF), and histopathology of affected tissue sites can provisionally diagnose *Cryptococcus* infection. Only evaluation of cultured isolates can confirm infection with *C. gattii*. In BC, all suspect isolates of *C. gattii* are confirmed by genotyping at the BCCDC laboratory. The most appropriate diagnostic specimens for culture are bronchial washings and CSF.

Imaging often reveals single or multiple chest or head masses, which may be misdiagnosed as malignancy. During biopsy of these masses, a por-

tion of the specimen should be sent to a bacteriology laboratory for culture as histopathologic investigation is insufficient to confirm *C. gattii* infection.

As *Cryptococcus* infection has been reportable in BC since 2003, all *Cryptococcus* cases should be reported to the local public health authority for follow-up.

The Infectious Diseases Society of America has published clinical practice guidelines for the management of cryptococcal disease.<sup>8</sup> However, specific guidelines for the management of *C. gattii* infection have not been developed. Due to slower responses, more frequent clinical relapses, and more neurologic sequelae, clinicians tend to treat *C. gattii* infection more aggressively than *C. neoformans*. Referral to a respirologist or infectious disease specialist for treatment is recommended.

It is unclear why *C. gattii* emerged on Vancouver Island in the late 1990s. Although *C. gattii* infection remains rare, it can have serious outcomes. Rapid diagnosis and treatment as well as reporting of the disease to public health authorities will help monitor spread and better understand this emerging disease.

For more information on *C. gattii* in BC, visit [www.bccdc.org](http://www.bccdc.org) and [www.cryptococcusgattii.ca](http://www.cryptococcusgattii.ca).

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**References**

1. Stephen C, Lester S, Black W, et al. Multispecies outbreak of cryptococcosis on southern Vancouver Island, British Columbia. *Can Vet J* 2002;43:792-794.
2. Kidd SE, Chow Y, Mak S, et al. Characterization of environmental sources of the human and animal pathogen, *Cryptococcus gattii* in British Columbia, Canada, and the Pacific Northwest USA. *Appl Environ Microbiol* 2007;73:1433-1443.
3. BC Centre for Disease Control. BC *Cryptococcus gattii* Surveillance Summary, 1999-2006. 2007. [www.bccdc.org/topic.php?item=109](http://www.bccdc.org/topic.php?item=109) (accessed 1 August 2007).
4. MacDougall L, Fyfe M. Emergence of *Cryptococcus gattii* in a novel environment provides clues to its incubation period. *J Clin Microbiol* 2006;44:1851-1852.
5. Lindberg J, Hagen F, Laursen A, et al. *Cryptococcus gattii* risk for tourists visiting Vancouver Island, Canada. *Emerg Infect Dis* 2007;13:178-179.
6. MacDougall L, Kidd S, Galanis E, et al. Spread of *Cryptococcus gattii* in British Columbia, Canada and its detection in the Pacific Northwest, USA. *Emerg Infect Dis* 2007;13:42-50.
7. Perfect JR, Casadevall A. Cryptococcosis. *Infect Dis Clin North Am* 2002;16:837-874.
8. Saag MS, Graybill RJ, Larsen RA, et al. Practice guidelines for the management of cryptococcal disease. *Clin Infect Dis* 2000;30:710-718.

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