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[Announcer] This podcast is presented by the Centers for Disease Control and Prevention. CDC – safer, healthier people.

[Announcer 2] Portions of this podcast were revised and rerecorded, January 23, 2007.

[Dan Rutz] I'm Dan Rutz, your host, today with Dr. David Warnock, Director of the Division of Foodborne, Bacterial, and Mycotic Diseases at CDC. David also serves as an associate editor for the journal *Emerging Infectious Diseases*.

And the January 2007 issue includes 3 articles about the spread of a rare fungus, *Cryptococcus gattii*, from Vancouver Island in Western Canada.

David, what makes this an emerging infectious disease topic? Many of us have heard of *Cryptococcus neoformans*, associated with bird droppings, but what is *Cryptococcus gattii*?

[David Warnock] Well, Dan, *Cryptococcus gattii* used to be classed as a variety of *Cryptococcus neoformans*, and it's only in the last few years that it's been reclassified as a separate fungal species.

Now, *Cryptococcus neoformans* is commonly found in pigeon droppings throughout the world, but about 15 years ago, a group of researchers in Australia reported that *Cryptococcus gattii* is associated with various species of the red gum group of eucalyptus trees.

These trees are indigenous to Australia, but they've been exported to many different countries, generally those with tropical or subtropical climates, including the U.S., southern Europe, Africa, India, South America.

In Australia, the distribution of *Cryptococcus gattii* infection generally corresponds to the distribution of these various species of eucalypts. *Cryptococcus gattii* has also been isolated from eucalypts in other countries, but the evidence that we're accumulating suggests there are probably a variety of other environmental sources as well.

The major risk factor for human and animal infection with *Cryptococcus gattii* appears to be environmental exposure. After inhalation of the infectious propagules, the disease presents as lung nodules, pneumonia, and meningitis, both in humans and in many species of animals.

Unlike *Cryptococcus neoformans*, which usually infects immunocompromised hosts, particularly those with HIV infection and AIDS, *Cryptococcus gattii* often infects perfectly healthy, immunocompetent people. The relative rarity of *Cryptococcus gattii* infections in immunocompromised patients is still something that puzzles us.

[Dan Rutz] Well thanks for that explanation but tell us more, please, about the Vancouver Island outbreak.

[David Warnock] Well, Vancouver Island is the largest island on the Pacific Coast of North America. It has a population of about 700,000 people and is separated from the mainland of British Columbia by the Straits of Georgia, which are about 30 miles wide.

The outbreak of *Cryptococcus gattii* infection was first detected back in 1999 and by 2002 it had been diagnosed in 46 residents and 6 visitors who had traveled to the Island from the mainland. The cases among the people who lived on the Island were generally among those who lived along the warmer, drier, east coast of the Island.

Between 2002 and 2005, the incidence of *Cryptococcus gattii* infection plateaued at around 36 cases per million population. And that's interesting because it's significantly higher than rates that have been reported from other parts of the world where *Cryptococcus gattii* infection's endemic.

There are also many cases of the disease among domestic and wild animals, including some porpoises that were found dead along the coast of the Island.

On the Island itself, the fungus has been isolated from many different types of environmental sample, including more than 10 different native tree species, as well as soil, water, and air samples. However, what the researchers have found is that some sites are only transiently colonized, while others remain colonized for very long periods of time.

Interestingly, one of the 3 papers that we have in this month's journal describes the isolation of *Cryptococcus gattii* from the wheel wells of the vehicles that they use to travel round the Island, and they also found it in wheel wells of vehicles on the mainland. They also found it on their footwear, indicating that anthropogenic dispersal of the organism is probably occurring.

They found increased levels of *Cryptococcus gattii* in the air when they tested forestry sites and other areas where woodchipping was taking place.

And finally it seems clear that this disease has only recently emerged on Vancouver Island. What's very unusual about this is that Vancouver Island has a temperate climate, when previously *Cryptococcus gattii* had been thought to be restricted to tropical and subtropical climates.

The reasons for the emergence of this new disease are not clear, but there are several hypotheses around, including importation of tropical plants and perhaps global warming.

[Dan Rutz] One article states that in the past travelers have carried *Cryptococcus gattii* from the Island to other areas, but now it's showing up in both people and animals without any contact with the Island. Why is the possible spread of *Cryptococcus gattii* beyond Vancouver Island a concern?

[David Warnock] Well, Dan, as you said, until 2003, all the human cases of *Cryptococcus gattii* that had been reported actually occurred among people who either lived in or who had traveled to the Island during the year before they became ill.

However, in 2004 and 2005, the disease was detected in 3 people and 8 animals residing in mainland British Columbia. None of these cases had visited the Island or any other known endemic area for *Cryptococcus gattii* infection.

All of these cases were infected with the same molecular type of *Cryptococcus gattii* found among the clinical and environmental isolates from the Island.

Animals and people outside British Columbia with no known link to Vancouver Island have also been infected. There are now reports of cases among 3 cats in Washington State and 2 people in Oregon. These cases represent the first evidence that we have local disease acquisition in the western United States.

What is still unclear is whether these cases outside Vancouver Island represent true colonization of the environment or simply transient dispersal of the organism. Despite repeated sampling, no environmental source has yet been detected on British Columbia mainland or in Oregon. However, two environmental samples from Washington State, one from soil, were positive for *Cryptococcus gattii*.

[Dan Rutz] Now one of the articles on the topic describing a case of infection in Denmark was linked to the patient's trip to Vancouver Island. What makes this important?

[David Warnock] I think there are several reasons why this report may interest readers of the journal.

Firstly, it's interesting because we don't have much information about the incubation period for cryptococcosis. Unlike other fungal diseases such as histoplasmosis and coccidioidomycosis, where we've dealt with many large point-source outbreaks that have allowed us to define the incubation period very precisely, it's hardly ever been possible to do this with cryptococcosis.

Here we have a case in a 51-year-old man, apparently immunocompetent, who fell sick 6 weeks after returning from a 3-week vacation in Canada. During that trip, he'd spent a week visiting the eastern coast of Vancouver Island, touring gardens and studying the local plant vegetation. The strain of *Cryptococcus gattii* recovered from this case was identical to that involved in the other Vancouver Island cases.

Second, this is the first time that cryptococcosis has been reported as a travel-related infection. This case report suggests that there is a potential risk of tourists acquiring the disease while visiting Vancouver Island.

The authors recommend that visitors and medical staff of healthcare facilities worldwide should be alert for symptoms of cryptococcosis after travel to the Island. Unfortunately, these symptoms and clinical signs are somewhat non-specific, but the diagnosis can be confirmed or ruled out by some simple and very reliable lab tests.

[Dan Rutz] Well David, thank you very much for a very interesting and practical observation.

Our discussion with Dr Warnock is prompted by the publication of 3 articles on *Cryptococcus gattii*. Those articles as well as others on emerging bacterial and viral diseases are available online from www.cdc.gov/eid

Comments on this interview may be sent to eideditor@cdc.gov. That's eideditor, one word, at cdc.gov

For Emerging Infectious Diseases, I'm Dan Rutz.

[Announcer] To access the most accurate and relevant health information that affects you, your family, and your community, please visit www.cdc.gov