

New *Ehrlichia* Species Emerges, Hits United States

A patient infected with the agent—which causes mild illness—was successfully treated with doxycycline.

ARTICLES BY JOHN R. BELL
Associate Editor

SAN ANTONIO — Physicians who see patients presenting with extreme localized pain beginning a few days after a tick bite have a new reason to consider the possibility of ehrlichiosis, based on findings reported at a meeting of the Southwest Conference on Diseases in Nature Transmissible to Man.

Researchers from the Centers for Disease Control and Prevention have discovered a possible new *Ehrlichia* species found to cause illness in humans, as well as goats. It has been determined that the vector for

the disease is the domestic Lone Star tick.

Amanda Loftis, D.V.M., of the CDC's medical entomology laboratory in Atlanta, reported a human case that she said could be a "divergent strain" of the bacterium *Ehrlichia ruminantium*, which is on the U.S. Department of Agriculture's watch list of foreign pathogens, or a new *Ehrlichia* species.

Dr. Loftis said the new bacterium is genetically similar to *Ehrlichia ruminantium*, common in Africa and the Caribbean but so far unreported in the United States. The new agent causes only mild illness in humans and animals, unlike *E. ruminantium*, which causes heartwater disease.

Five days after removing a tick from his upper arm, the patient, an Atlanta man, experienced extreme neck pain that was unresponsive to NSAIDs. He presented to a physician 4 weeks after removing the tick. The physician suspected tick-borne illness, took a blood sample, and administered doxycycline; the patient reported significant improvement in neck pain after 48-60 hours, Dr. Loftis said.

Dr. Loftis and her colleagues first discovered the new agent when they tested local ticks on a laboratory goat that subsequently became mildly ill. Genetic tests for five genes showed that the agent infecting the goat was highly similar to *E. ruminantium* but not identical to any described strains.

Further, the CDC performed DNA tests on the patient's blood and found *Ehrlichia*

DNA identical to sequences found in the goat and in wild Lone Star ticks. No other bacterial DNA were detected, Dr. Loftis reported at the meeting, held in conjunction with the International Conference on Diseases in Nature Communicable to Man.

"Nothing like this has ever been reported from the United States," Dr. Loftis said. "The scary thing is that the Hartsfield international airport, a USDA port of entry for import of animals, is very close to our collection site. Both are within the Atlanta metro area—so we have to ask the question, where did this come from?" she said.

There are 13 species of tick that can be vectors of *Ehrlichia ruminantium*, but only 3 of these species live in the United States, she noted. ■

Powassan Encephalitis Cases Rising in Northeast, Canada

SAN ANTONIO — The incidence of Powassan encephalitis, a tick-borne cause of long-term neurologic problems, disability, and death, has recently been increasing in the northern United States and in Canada, and a second virus lineage found in the deer tick might someday enable the disease to spread even farther, a researcher from the New York State Department of Health reported.

The U.S. infection rate, which had held at 0.7 cases per year for 30 years, has climbed to 1 case per year since 1998, Susan Wong, Ph.D., said at the Southwest Conference on Diseases in Nature Transmissible to Man.

According to the Centers for Disease Control and Prevention, mild cases of arboviral encephalitis may present with only a slight fever and/or headache and body aches. Severe infections, however, occur with rapid onset and usually feature high fever, headache, and disorientation; they can include tremors, convulsions, paralysis, coma, and death. There is no effective treatment for the disease, which is fatal in 10%-15% of cases.

The primary lineage of Powassan virus is carried by a tick (*Ixodes cookei*) that feeds on the woodchuck (groundhog) and other small mammals, including squirrels and chipmunks, Dr. Wong said. Persons at greatest risk of infection are residents of the aforementioned regions who have close exposure (e.g., via gardening) to woodchuck burrows. Most cases occur from May to December, with the peak incidence from June to September.

During 1999-2001, four cases of Powassan encephalitis were reported in New Hampshire and

Maine. During 2002-2006, there were two cases in New York (one in Westchester County, a suburb of New York City), as well as one in Wisconsin and one in Michigan, she said.

This contrasts with the 1958-1998 period, wherein there were only 27 human cases in the United States and Canada.

Moreover, a second strain of the virus was found in the deer tick (*Ixodes scapularis*) in the 1990s, she noted, adding that in this second lineage there appears to be "perhaps a greater epidemic potential," because this tick species is the one that carries Lyme disease, ehrlichiosis, and other more common tick-borne diseases.

Dogs and horses can also become infected by ticks carrying the virus and can spread it to humans, she noted at the meeting, which was held in conjunction with the International Conference on Diseases in Nature Communicable to Man.

Powassan viral isolates have been found in California, South Dakota, New York, West Virginia, Connecticut, Massachusetts, and Maine, as well as Ontario. Moreover, serologic testing has identified human infections in most other Canadian provinces bordering the United States, Dr. Wong said.

The virus until recently was considered a low threat to human health.

In North America, the disease first appeared in Canada in 1958, in a patient from Powassan, Ont. The first U.S. case occurred in New Jersey in 1970.

The Powassan virus is the least common cause of arboviral encephalitis in North America, whereas West Nile virus is the most common. ■

Eastern Equine Encephalitis on Upswing in New England States

The Centers for Disease Control and Prevention has warned of an upswing in cases of eastern equine encephalitis in New England, including—for the first time in 41 years of reporting of the disease—cases occurring in New Hampshire.

In a report discussing cases occurring during August and September of last year, in addition to the seven New Hampshire cases, there were four from Massachusetts—five times the average of 0.08 for the previous 10 years (MMWR 2006;55:697-700).

The CDC advises health care providers to be aware of the risk of Eastern equine encephalitis virus (EEEV) "even in areas that have not previously had much activity."

EEEV is spread by mosquitoes and can affect horses, as well as humans. Mosquitoes

carrying the EEEV most commonly inhabit swamps and marshes, the report said.

Notably, all of the infected patients spent time working or socializing near such wetland areas, and all lived within half a mile of a swamp or cranberry bog.

Dr. Julia McMillan, a member of the American Academy of Pediatrics' Committee on Infectious Disease and professor of pediatrics at Johns Hopkins University, Baltimore, agreed with the CDC's recommendations to use insect repellent and long-sleeved clothing to keep insects at bay.

Given that EEEV, like malaria and dengue, is caused by a virus, there is no specific treatment for this potentially fatal infection.

"I think that actually is one of the scariest things. It's the reason why protecting children

and ourselves is so important," Dr. McMillan said.

When asked if the chemicals in insect repellent are safe for children, she said that moderation is called for. "There is no way to keep a child completely safe," she said. "But that doesn't mean [parents] should not try. It's just important to understand that everything is a balance."

The CDC on its Web page on West Nile virus cites the Environmental Protection Agency's advice: "Do not allow children to handle the [insect repellent]. When using on children, apply to your own hands first and then put it on the child."

Likewise, the AAP warns not to apply DEET (N,N-diethyl-m-toluamide) to the hands of young children and to avoid applying it to areas around a child's eyes and mouth. ■

Dengue Cases Rising in Tropics, CDC Warns

Increases in the incidence of dengue hemorrhagic fever in tropical countries also have prompted the CDC to remind health care providers to consider this disease when diagnosing febrile patients who have recently returned from areas of risk—and to remind the public of protective measures.

There were 96 confirmed cases of dengue in U.S. residents last year, the CDC reported (MMWR 2006;55:700-2). Dengue, which is not endemic to North America, is not seen commonly by physicians here—but with increasing international travel, global warming, and slackening antimosquito efforts in some countries, more suspected cases of dengue may be seen, particularly during the summer months.

Travelers need to remember that when they go to tropical areas, mosquitoes may carry diseases that are not found in the United States. Malaria chemoprophylaxis does not protect against mosquitoes—just against the malaria that they carry, Dr. McMillan noted.

The CDC advises preventing dengue transmission by using insect repellent including DEET.

Unlike EEEV, Dr. McMillan noted, dengue is not now carried by mosquitoes in this country—and EEEV is very rare where it does exist. "The CDC report [on EEEV] is significant because EEEV, unlike dengue, has high mortality rate associated with it," she said.