Medical Xpress

Species barrier may protect macaques from chronic wasting disease

July 30 2009

Data from an ongoing multi-year study suggest that people who consume deer and elk with chronic wasting disease (CWD) may be protected from infection by an inability of the CWD infectious agent to spread to people. The results to date show that 14 cynomolgus macaques exposed orally or intracerebrally to CWD remain healthy and symptom free after more than six years of observation, though the direct relevance to people is not definitive and remains under study.

Cynomolgus macaques often are used as research models of human disease because they are very close genetically to humans and are susceptible to several forms of human brain-damaging disease. Thus, it was decided to see whether exposure to CWD could induce disease in the macaques. The study appears online in the journal *Emerging Infectious Diseases*.

CWD is a type of brain-damaging disease known as a transmissible spongiform encephalopathy (TSE) or prion disease. CWD primarily affects deer, elk, and moose. Other TSE diseases include mad cow disease, or bovine spongiform encephalopathy (BSE) in cattle, scrapie in sheep, and sporadic Creutzfeldt-Jakob disease (CJD) in humans. Humans are not susceptible to sheep scrapie, but BSE appears to have infected about 200 people, primarily in Europe in the 1990s. Those findings provided the rationale for the present CWD-macaque study, which began in 2003.

"We plan to continue this study for at least several more years because,

although the risk to macaques so far appears to be low, we know that these diseases can take more than 10 years to develop," says Bruce Chesebro, M.D., chief of the Laboratory of Persistent Viral Diseases at Rocky Mountain Laboratories (RML) in Hamilton, Mont. RML is part of the National Institute of Allergy and Infectious Diseases (NIAID) of the National Institutes of Health (NIH). The RML group is leading the study with collaborators from the Colorado Division of Wildlife; State University of New York Downstate Medical Center; New York State Institute for Basic Research in Developmental Disabilities; American Red Cross; and the University of Wyoming.

The findings by the RML group support published field studies done by others in regions of Colorado and Wyoming where CWD is endemic. Between 1979 and 2001, there were no significant increases in human TSE diseases despite the likelihood that hunters in those areas were exposed to CWD through contact with infected animal tissue and contaminated hunting tools such as knives and saws. Extensive laboratory data also supports a human species barrier against CWD.

Notably, the RML study also included identical testing in squirrel monkeys, which are genetically less similar to humans than macaques. Of 15 squirrel monkeys exposed orally to CWD, two displayed disease symptoms 69 months after infection. Of 13 squirrel monkeys exposed intracerebrally to CWD, 11 displayed symptoms between 33 and 53 months after infection. In symptomatic animals, the presence of the CWD agent was confirmed in brain, spleen and lymph nodes.

The results in squirrel monkeys were not surprising because a study elsewhere in two squirrel monkeys yielded similar results. The study by the RML group was different, however, in that it tested oral exposure to CWD and also studied eight CWD samples from different areas of the country. The results in squirrel monkeys confirmed that disease progression in that species appears consistent with disease progression in

deer and elk, where severe weight loss is nearly always present.

"The fact that the squirrel monkeys, like the deer and elk, suffered severe weight loss suggests that chronic wasting disease might affect a common region of the brain in different species," notes Dr. Chesebro.

More information: Race B et al. Susceptibilities of nonhuman primates to chronic wasting disease. Emerging Infectious Diseases. DOI: 10.3201/eid1509.090253.

Source: NIH/National Institute of Allergy and Infectious Diseases (news : web)