



Is There a Breach in the Barrier Protecting Humans from Cervid Chronic Wasting Disease?

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Chronic wasting disease (CWD) is a prion-derived disease causing lethal spongiform encephalopathy in cervids like deer, elk, moose, and reindeer (1). It is similar to other zoonotic spongiform encephalopathies that are deadly to humans such as bovine spongiform encephalopathy, or mad cow disease, and holds potential for lethal spillover into human populations (2). Concern regarding potential spillover into humans is increasing as CWD is rapidly spreading across wild cervid populations in North America, cervids that are consumed by millions of hunters (3). In a recent *mBio* Opinion/Hypothesis piece, Osterholm et al. (2) reviewed the state of the science of CWD and offered precautionary guidelines for its management to reduce risks of spillover. The precautionary guidelines proposed are warranted. However, the article relied on unpublished data to conclude that CWD may transmit to human-like primates. This conclusion could have massive ramifications for human health, hunter behavior, wildlife management, and local economies over large regions of North America (3, 4), as it suggests greater potential for CWD to breach the cervid-human barrier. Yet, there is no published evidence for CWD transmission to human-like primates at this time.

In reviewing recent studies examining CWD transmission from cervids to human-like primates, Osterholm and colleagues emphasized unpublished studies to conclude that cynomolgus macaques (CM) had been experimentally infected by consuming muscle tissue from CWD-positive deer (bottom of page four). If verified, this is a significant finding because meat consumption is the most likely path for transmission to humans, and CM, as Old World primates, would be the most similar organisms to humans to be infected with CWD. However, examination of the supporting citations reveals a slide show of preliminary research from 2017 (5) and a popular press article highlighting the same (6). As of this writing, a literature search generated no evidence of a peer-reviewed publication documenting the transmission of CWD to CM described by Osterholm and colleagues. While the authors acknowledged the unpublished nature of the work, a thorough review of the scientific literature on this topic published in 2017 (1) found no evidence for transmission of CWD to CM. Moreover, in 2018, Race et al. (7) found no evidence for transmission of CWD to CM using multiple tests, even 11 to 13 years after being “inoculated by either the intracerebral or oral route with brain homogenates from CWD-infected deer and elk containing high levels of infectivity.” Finally, attempts to infect transgenic mice expressing human prion proteins, arguably the best model for human infection, have also failed (see references 1 and 8 for reviews and caveats). Verification that CWD can breach the cervid-human barrier or infect human-like primates would have profound implications for millions of hunters and their families who consume cervid meat, for wildlife management, and for CWD management (3, 4). If available, such evidence should be borne out expediently. Otherwise, it is essential that the record be clearly and accurately stated. Nonetheless, absence of evidence is not evidence of absence (9)—the potential for CWD transmission to humans is real, and the precautionary measures proposed by Osterholm et al. are warranted.

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