Rabies Virus in Bats, State of Pará, Brazil, 2005–2011

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Abstract

Rabies is an acute, progressive zoonotic viral infection that in general produces a fatal outcome. This disease is responsible for deaths in humans and animals worldwide and, because it can affect all mammals, is considered one of the most important viral infections for public health. This study aimed to determine the prevalence of rabies in bats of different species found in municipalities of the state of Pará from 2005 to 2011. The rabies virus was detected in 12 (0.39%) bats in a total of 3100 analyzed, including hematophagous, frugivorous, and insectivorous bats. Of these, eleven were characterized as AgV3, which is characteristic of the hematophagous bat Desmodus rotundus (E. Geoffroy 1810); one insectivorous animal showed a different profile compatible with the Eptesicus pattern and may therefore be a new antigenic variant. This study identified the need for greater intensification of epidemiological surveillance in municipalities lacking rabies surveillance (silent areas); studies of rabies virus in bats with different alimentary habits, studies investigating the prevalence of AgV3, and prophylactic measures in areas where humans may be infected are also needed.

Keywords: bats, rabies, Brazil, Pará

Introduction

Rabies is an acute, progressive viral disease that affects mammals (including humans), causing neurological disorders characterized by encephalomyelitis; the outcome is fatal in nearly all cases (Rupprecht et al. 2002, Acha and Szyfres 2003, Dantas-Torres 2008). First described at least four millennia ago, rabies is one of the oldest infectious diseases known to humans (Rupprecht et al. 2001, Takaoka 2003, Almeida 2008). The disease is endemic to many countries around the world, and wild or domestic mammals can act as hosts, reservoirs, and transmitters, and occasionally the disease is transmitted to humans (Takaoka 2003, Velasco-Villa et al. 2006, Barbosa et al. 2007b). The etiological agent of rabies is the rabies virus, a neurotropic RNA virus belonging to the order Mononegavirales, family Rhabdoviridae, and genus Lyssavirus (Wu et al. 2002, Fauquet et al. 2005, Finke and Conzelmann 2005). The etiological agent of rabies is the rabies virus, a neurotropic RNA virus belonging to the order Mononegavirales, family Rhabdoviridae, and genus Lyssavirus (Wu et al. 2002, Fauquet et al. 2005, Finke and Conzelmann 2005). The rabies virus is transmitted by the saliva of infected animals, most commonly through bites, more rarely when an animal licks cuts or existing skin lesions, and sometimes through healthy or damaged mucous membranes (Kotait et al. 2009, Travassos da Rosa et al. 2013). All mammals are susceptible to the rabies virus infection; however, members of the orders Carnivora and Chiroptera are the main agents responsible for the transmission of the disease and its maintenance in nature. These animals transmit rabies through cycles that are interrelated because they have characteristics such as high population densities, long-distance movement capacity, intense social interactions, and synanthropic habits (Kotait et al. 2003, Velasco-Villa et al. 2006, Barbosa et al. 2007b, De Andrade et al. 2016).

The incubation period of rabies is variable, ranging from days to more than a year (Kotait 1996); this period appears to be related to the proximity of the lesion to the central nervous system (CNS), the pathogenicity of the virus strain, the innervation at the site of the lesion, the severity of the lesion, the amount of rabies virus inoculated, and factors intrinsic to the individual (Jackson 2003). The pathogenesis resulting from infection with the rabies virus is similar in all