CO.09
ENCEPHALITIS OF UKNOWN ETIOLOGY AND HUMAN RABIES IN THE UNITED STATES, 1999-2008

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Encephalitis is a severe neurologic syndrome caused by a variety of infectious and noninfectious pathologies. In many instances a definitive etiology of encephalitis is not identified, but a study of encephalitis in California found that 0.3% of cases referred for further evaluation to a specialized diagnostic facility (Glaser, Gilliam et al. 2003) was due to rabies. Under recognition of human rabies in the United States by healthcare providers may account for missed diagnoses of rabies. The purpose of this investigation was to estimate the number of encephalitis-related deaths in the United States and the proportion due to rabies specifically. We reviewed human mortality data in the United States between 1999-2008 and identified encephalitis-associated deaths using ICD-10 codes. Codes were categorized based on if an etiology of encephalitis was listed or not. We also reviewed all laboratory-confirmed human rabies cases within the United States and its territories that were reported to the Centers for Disease Control and Prevention (CDC) during this same time period. A total of 12,457 cases of encephalitis-associated deaths were identified, of which 8726 (70%) were of unknown etiology. Twenty (0.2%) cases were coded as rabies. During this same time period, 27 confirmed cases of rabies were reported to CDC. Of these 27 cases, 6 of the exposures occurred in countries other than the USA. Dogs were the most commonly reported exposure among imported cases. Of the 21 indigenous cases, 14 were attributable to bats, 4 to tissue/organ transplantation, 1 to a dog exposure in Puerto Rico and 2 from unknown sources. Our findings suggest that the majority of encephalitis-associated deaths in the United States were of unknown etiology. Among the confirmed cases of rabies, the majority who acquired rabies within the United States acquired the infection from wildlife. Nearly 10% of the indigenous cases occurred through an unknown exposure. Healthcare providers should consider evaluating for rabies when a patient develops acute progressive encephalitis of unknown etiology despite routine evaluation or if clinical history is suggestive. Glaser, C. A., S. Gilliam, et al. (2003). "In search of encephalitis etiologies: diagnostic challenges in the California Encephalitis Project, 1998-2000." Clin Infect Dis **36**(6): 731-742.

CO.10
HUMAN RABIES IN RIO CASCA MUNICIPALITY, 2012: CASE REPORT, SIX YEARS AFTER THE LAST RECORD IN MINAS GERAIS, BRAZIL

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Rabies is a viral disease that affects the central nervous system (CNS) of mammals and it's fatal in almost 100% of cases. In 2012, six years after the last record of a human case in Minas Gerais, the transmission has been confirmed through aggression by vampire bat. The objective of this report is to describe the clinical and epidemiological characteristics of this case. On 06/19/2012, the Health Department of Minas Gerais State has been notified by the Regional Health Department of Ponte Nova of a suspected case of human rabies from Rio Casca municipality. He was a 32-year-old male patient, farmer, residing in the rural area. The patient suffered bitten by a bat in his right hand after trying to remove it from the back of a calf in the month of May. At that time the patient did not seek medical care and the event was not notified to health service or the agriculture department. The calf died about 10 days after the incident and no material was sent for laboratory examination. Since 06/11/2012, the patient successively sought care because of a barbed wire cutting on the same hand attacked by the bat, which began to show dormancy. Then he developed lip deviation, fever and vomiting, and clinical progression toward paresthesia, insomnia, agitation, confusion, sore throat and drooling. Tetanus, muscle twisting and tonsillitis were diagnostic hypotheses raised by the municipal health services. The aggression was reported only after assistance at Ponte Nova municipality, and suspected human rabies was notified. On the same day, the patient was transferred to the referral hospital in Belo Horizonte municipality for specialized care. Patient sedation was maintained, with antiviral administration and control of symptomatic complications. The patient developed hypernatremia, ventilator-associated pneumonia and cardiac arrests. There was *antemortem* laboratory confirmation of rabies infection by Polymerase Chain Reaction (PCR) in cerebrospinal fluid and saliva sample, and genetic sequencing indicated that it was compatible with *Desmodus rotundus* genetic variant. Despite specific treatment, the patient died on 06/28/2012 due to refractory circulatory shock. *Postmortem* examination was performed by direct immunofluorescence reaction, with infection confirmation at CNS fragments. During the conduct of the case, epidemiological investigation was proceeded by medical reports and records reviewing, family interviews and active search of exposed. In association, health education, social mobilization and intersectoral work actions were developed. Through the described information it is evident the importance of health systems being able to properly suspect, notify, and investigate, added to need to maintain surveillance and control activities of rabies in Minas Gerais state.

CO.11
MEASURES OF RABIES IMMUNITY IN RELATION TO SUSCEPTIBILITY, DIAGNOSIS AND PREVENTION

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A number of reports describe limited numbers of animals inoculated intentionally with rabies virus that do not become ill and may have little to no detectable antibody while other conspecific individuals succumb to the same inoculum. This review will detail methods used in measuring immunity and optimal method validation, in relation to potential identification of baseline susceptibility, enhanced disease diagnosis, and optimal prevention practices for humans and animals. Potential factors for successful rabies virus infection include: 1) protection of infected neurons from host immunemediated destruction by the inhibition of virus-mediated apoptosis and overexpression of immune-subversive molecules resulting in killing or inactivation of 'protective' T cells migrating into the infected nervous system; 2) an hypothesis that lethality results from neuronal dysfunction inhibiting proteins required for neuronal maintenance; 3) a posit that virus phosphoprotein and host cell dynein light chain 8 interaction may regulate viral ribonucleoprotein linking to cell transport; 4) a thesis that innate immunity, paradoxically, favors rabies virus neuro-invasiveness through enhanced infiltration and promotion of CD8(+) T cell elimination; and then alternatively that ; 5) type I IFN produced in the rabies virus-infected nervous system reduces neuroinvasiveness and partially protects from fatal infection. It is clear that innate immune cells detect pathogens, most likely including rabies virus, via pattern recognition receptions, such as Toll-like receptors and others. Pathogen-associated molecular