Rabies Virus Monitoring in Bats from the Direct Influence of Hydroelectric Power Plant in Jirau, Rondônia, Brazil

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In Rondônia State, North region of Brazil is being built at Madeira River, the hydroelectric power plant of Jirau. The implementation of huge enterprises such as the hydroelectric demands a series of alterations in the environment, such as vegetation suppression and movement of land in large extension along with other antropic activities of high environmental impact. These activities can destroy the artificial and natural shelters for bats. Several studies have pointed an association between these environmental changes and outbreaks of rabies. Monitoring Jirau’s bat population began in 2010 and it was made over a period of three years, with regular visits lasting 10 to 12 days, twice a year, totaling six campaigns. First, the local population was interviewed aiming at eliciting what they knew about rabies and bats and to locate the shelters of these animals. In the period of three years, 158 people were interviewed, 4,387 bats were captured by mist net or active search and 3,892 of them were loose after this proceeding. Regarding to bats, 535 bats and 486 sera were sent for diagnosis and antibodies dosage respectively at CCZ-SP by Direct Fluorescence and Simplified Fluorescence Inhibition Microtest. All bats were negative to rabies. The global prevalence of antibodies was 15.4% using 0.5IU/ml as a cut-off (0% in the first campaign, 2.8%, 6.4%, 19.2%, 14.8% and 36.3% in the subsequent campaigns). In the interview 93.5% declared to know the disease, however rabies was associate to dogs and just 52.5% knew that bats could transmit rabies. Regarding the type of houses, 93.5% were vulnerable to bats presence and bats were roosting in 70% of these houses. The results for rabies antibodies dosage showed a progressive increase for every subsequent campaign. As the first campaign was performed before the demolition of the houses and vegetation suppression in the direct area of influence of the hydroelectric, these results could be reflecting the perturbation inflicted to the population of bats such as the stress of the forced migration to search for new shelters and foraging areas as well as the disputes for space and food with the bats populations already established in the new shelters up to the moment when there is the reestablishing of the colonies. Considering just the presence of antibodies as indicative of the contact with the virus, the average of titers in the first and second campaigns was 0.03UI/ml and 0.04UI/ml while in subsequent campaigns this average was 0.21UI/ml, 0.49UI/ml, 0.24UI/ml and 0.38UI/ml respectively. When statistically analyzed by Kruskal-Wallis (H=1,611,942; p<0,0001) and Dunn (R=44,330) these tests confirmed that there is significant difference in the results observed among the campaigns and the difference observed between the results of first campaign and subsequent campaign is significant. These data indicate the increase of rabies virus circulation among these bat populations and suggest a potential risk of rabies outbreak that should be monitored.

A progression of the focus of rabies in our bovines is associated to the localizations of the abrigos of Desmodus rotundus that by their presence, stay related to the principal feições geográficas of a region. Many studies considered elevated altitudes, rios or the determination type of cobertura of the earth as fator protetor or causal for diffusion of epidemics. Geotechnologies were utilized by Gomes et al (2011) for gerar a model descritivo with three camadas sobrepuestas: a enfermedad characterized by a function kernel of the spots of raivas from 1992 to 2003, the types of use and cobertura of the earth obtained by classification of images of satélites and a altitude oriunda of the radar SRTM. Second, the authors, a enfermedad esteve fortemente moldada pelas áreas of vegetação rasteira (pastagens). The relevo formou os mosaicos of use and cobertura of the earth, the qual determined the local of grassamento or not of the enfermedad. Constataram-se regiões permeáveis of menores altitudes of the Serra da Mantiqueira na divisa of estado of Minas Gerais that were carreadores of cases, as as, áreas delimited by the serra da Quebra Canga that divides horizontally the Vale do Paraíba. The analise temporal demonstrated that the focies had sentido of the estado of Minas Gerais for o de São Paulo. Frontal a constantações, the Coordenadoria of Defesa Agropecuária of the estado of São Paulo (CDA) prioritized a faixa in the divisual estadual for realização of lab works of controle of the enfermedad. The local related as carreadores also are related to others introduction of novos casos. Of course, validating the primeiro model descritivo, Focos, agora identified as pontos of coordenadas adquiridos por receptor of GPS in the anos of 2008 and 2012, demonstrated que o vale do rio Sapucaia and Sapucaia-Mirim proportionaux faixas of menores altitudes in the Serra da Mantiqueira for introduction of raivas in the Região of Bragança Paulista and São José dos Campos. The Serra da Mantiqueira, in the região of Cacoende and Cruzeiro, also possesses cortes of menores altitudes that possibilizam maior permeability of focies. For, in the divisual da Serra da Cananéia também ocorre tais formações of baixa altitude. Assim, these analyses descritivas sugerem que a CDA possa definir menores áreas of prioridade of controle of the enfermedad, that delimited areas of específicas sentinelas and of controle of Desmodus rotundus in the faixas of menores altitudes in the serras aqui estudadas. Trabalhos conjuntos with e estado mineiro deveriam ser formen- tados. Agradecimentos a Coordenadoria de Defesa Agropecuária and FAPESP projeto Nº 03- 12319-0 Gomes MN, Monteiro AMV, Escada MIS. Raiva bovina segundo those mosaicos of use and cobertura of the earth in the estado of São Paulo between 1992 and 2003. Arq. Bras. Med. Vet. Zootec.. v. 63, p. 287, 2011.

Apliação del Manejo Integrado de Plagas (M.I.P.) en el Control del “Desmodus Rotundus” en Costa Rica

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Las pérdidas económicas en nuestra ganadería aumentan año con año por causa del Desmodus rotundus (murciélago hematófago) estimándose en $800.000.00 por año. La principal enfermedad que transmiten es la rabia paralítica bovina y la ecología de nuestro país hace propicia la multiplicación de este vector. De las 110 especies de murciélagos que existen en Costa Rica, solamente tres son hematófagas y generalmente los ganaderos no distinguen esas de las otras especies que tienen una gran importancia ecológica, por lo que eliminan ecosistemas enteros utilizando métodos equivocados en cuevas, troncos huecos y otros refugios, ya que por vivir en grupos numerosos son los animales más susceptibles a la extinción. El Programa Nacional de Rábia Paralítica Bovina del Ministerio de Agricultura y Ganadería lleva a cabo el control de este vector, tomando en cuenta el concepto de MIP (Manejo Integrado de...
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SUSCEPTIBILITY OF MYOTIS LUCIFUGUS TO HETEROLOGOUS AND HOMOLOGOUS RABIES VIRUSES.
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Rabies virus (RV) maintenance in bats is not well understood. Eptesicus fuscus, Myotis lucifugus, and Tadarida brasiliensis are the most common bats species in the US. These colonial bat species also have the most frequent contact with humans and domestic animals. However, the Lasionycteris noctivagans/Perimyotis subflavus (Ln/Ps) RV is associated with the majority of human rabies virus infections in the United States and Canada. This is of interest because the L. noctivagans and P. subflavus bats are more solitary bats with less frequent human interaction. Our interest was to determine the likelihood of a colonial bat species becoming infected with and transmitting a heterologous RV. To determine the potential of heterologous RV infection in colonial bat species, M. lucifugus bats were inoculated with a homologous or one of two heterologous (L. fuscus and L. noctivagans) RV. Additionally, to determine if the route of exposure influenced the disease process, bats were inoculated either intramuscularly (i.m.) or subcutaneously (s.c.) with a homologous or heterologous RV. Bats were observed for 6 months. Survivors were challenged i.m. with a homologous RV and observed for an additional 6 months. Our results demonstrate intramuscular inoculation results in a more rapid progression of disease onset as compared to a significantly longer incubation time in bats inoculated s.c. Additionally, cross protection was not consistently achieved in bats previously inoculated with a heterologous RV following a six month challenge with a homologous RV. Finally, bats that developed rabies following s.c. inoculation were significantly more likely to shed virus in their saliva and demonstrated increased viral tissue tropism. In summary, bats inoculated via the s.c. route are more likely to shed virus thus increasing the potential for transmission.

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CDC’S GLOBAL DISEASE DETECTION PROGRAM AND THE INTERNATIONAL HEALTH REGULATIONS: PROVIDING EARLY WARNING TO CDC FOR HUMAN RABIES OUTBREAKS
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In 2003, the spread of SARS alerted public health leaders that novel pathogens could be transmitted along international travel routes with unprecedented speed. With the realization that an outbreak anywhere in the world was a potential threat to virtually all countries, the United States Congress in 2004 authorized the appropriation of funds to establish a Global Disease Detection (GDD) program, based at the CDC, with the aim of promptly detecting and mitigating the consequences of emerging threats. The GDD program provides a platform to develop and strengthen global capacity to rapidly detect, identify, and contain emerging infectious disease and bioterrorist threats in line with the International Health Regulations (IHR), which entered into force in June 2007 and legally requires all signatory nations to establish systems to detect and respond to new disease threats. The GDD program was subsequently selected by WHO as a key partner to help implement the IHR (2005) for its 194 member states and in 2009 was designated a WHO Collaborating Center for Implementation of IHR National Surveillance and Response Capacity. A significant component of GDD is the GDD Operations Center (GDDOC), an epidemic intelligence unit which uses novel, event-based surveillance techniques to provide CDC programs with a single source of reliable, comprehensive, and high quality information on international disease outbreaks, and provides logistical and financial support to CDC programs for emergency deployments to international outbreaks. Technological advances have revolutionized the way information is accessed, and event-based surveillance provides a mechanism for the organized and rapid collection and verification of information about events that are a risk to public health, particularly with regard to emerging zoonoses, which countries sometimes cannot or do not report to the global public health community. A re-emerging, global zoonosis that the GDDOC actively monitors is rabies in both animals and humans. Since 2009, the GDDOC has provided supported epidemiologic, logistical, or financial support to CDC’s Rabies Program for emergency deployments to the Dominican Republic, Peru, Ecuador, and Kenya to mitigate outbreaks of human rabies associated with canine and vampire bat rabies. Because of the GDDOC’s work to actively identify and report rabies-related event-based surveillance data to CDC’s Rabies Program, CDC is better positioned to respond to a request for technical assistance by the affected countries and establish core capacities in compliance with IHR.

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RESULTS WEBSITE FOR RABIES DIAGNOSTIC CONSULTATION INTO THE HEALTH SERVICES OF COAHUILA, MEXICO.
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Background: Health Services of Coahuila had not a rabies diagnostic laboratory. It was needed to send samples to Nuevo Leon and InDRE to solve this limitation. On April, 2010, the State Authorities established this laboratory that is placed inside the facilities of the State Laboratory of Public Health. On July, 2010 the laboratory formalized operations with the InDRE. The laboratory has 2 employees: a professional diagnostics specialist and a laboratory technician. Challenges: Sample shipments for rabies virus monitoring to other states. Extempory reception of other states results. No clear idea about rabies virus circulation and sanitary risk status in the State. Expensive operational costs. Several criteria of rabies PEP based on lab results. The laboratory had not a working algorithm for technical and epidemiological reports as well as for laboratory results. The lab had not a standard protocol to establish a timely diagnostic. Alternatives of Solution: To develop a feasibility study for the operation of a rabies diagnostic laboratory and to identify the mechanisms and support elements to establish this laboratory. Review the operative and financial plans and rabies vaccines availability for PEP. Website design for electronic consultation via Internet, to get the timely diagnostic according with the needs and request from the laboratory units. Operation: The Epidemiological surveillance of rabies in the State is...