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Equine infectious anemia in carthorses from urban areas of southern Brazil

Anemia infecciosa equina em cavalos carroceiros de áreas urbanas do sul do Brasil

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Abstract

Equine infectious anemia (EIA) is an infectious viral disease caused by a *Lentivirus*, which affects equids worldwide. The disease has no currently treatment and euthanasia of infected animals is mandatory by the Brazilian Ministry of Agriculture, Livestock and Supply (MAPA) as basis for disease control. Carthorses are used to move daily throughout the cities with their owners to collect recycling materials. Considering the socio-economic importance of this group of horses, the aim of this study was to determine the infection rate of EIA virus in carthorses from urban areas of Curitiba and surroundings. The detection of anti-EIA virus antibodies was performed by the agar gel immunodiffusion test (AGID). One out of 97 (1.03%) horse was positive for EIA.

Active surveillance programs are crucial for monitoring, prevention and control of infectious diseases, particularly in carthorses, which may act as disseminators of pathogens.

Key words: AGID, carthorses, EIA, equids, horses

Resumo

A anemia infecciosa equina (AIE) é uma doença infecciosa causada por um Lentivírus, acometendo equídeos em todo o mundo. Esta doença não possui tratamento e a eutanásia dos animais infectados é obrigatória pelo Ministério da Agricultura, Pecuária e Abastecimento (MAPA) como base para o controle da doença. Os cavalos carroceiros são utilizados diariamente pelos seus proprietários na coleta de materiais recicláveis nas cidades. Considerando a importância socioeconômica deste grupo de cavalos, o objetivo deste estudo foi determinar a taxa de infecção pelo vírus da AIE em cavalos carroceiros de áreas urbanas de Curitiba e região metropolitana. A detecção de anticorpos anti-AIE foi realizada pelo teste de imunodifusão em ágar gel (IDGA). Apenas 1 de um total de 97 (1,03%) cavalos foi positivo para AIE. Programas de vigilância ativa são cruciais para o monitoramento, prevenção

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e controle de doenças infecciosas, particularmente em cavalos carroceiros que podem atuar como disseminadores de patógenos.

Palavras-chave: AIE, carroceiros, cavalos, equídeos, IDGA

Equine infectious anemia (EIA) is an infectious viral disease caused by an equid-specific *Lentivirus* of the *Retroviridae* family, which affects equids worldwide (MEALEY, 2007). EIA virus is transmitted through the blood from infected to susceptible horses, either by blood-feeding insects (mainly *Stomoxys calcitrans* and *Tabanus sp.*), vertical transmission in uterus or at parturition, or by contaminated fomites (MEALEY, 2007). Horses usually recover from either acute or chronic clinical disease but remain life-long carriers of the virus (SELLON et al., 1994); therefore, they may introduce this organism into disease free-areas.

The Brazilian National Program of Equine Health has established the identification of EIA virus infection by the agar gel immunodiffusion test (AGID), with seropositive horses either euthanized or placed in quarantine as basis for disease control (BRASIL, 2004). Based on national census, the EIA prevalence is approximately 3%, however the EIA status remains unknown for most horses in Brazil (BRASIL, 1998).

Curitiba and surroundings, Paraná State, southern Brazil, is included in an extension project entitled 'CartHorses'. The project consists of activities for diagnosis, prevention and control of zoonotic diseases. Owners use carthorses to pulled carts daily throughout the cities to collect recycling materials. According to the City Center of Disease Control, Curitiba has approximately 1,500 carthorses. Considering the social-economic importance and the lack of information regarding this virus in horses from urban areas of Paraná State, the aim of this study was to determine the infection rate of EIA virus in carthorses attended by the CartHorse program.

The Ethics Committee in Animal Experimentation and Animal Welfare at the

Universidade Federal do Paraná (protocol number 027/10), Paraná State, Brazil approved this study. A convenient blood sampling was performed from 97 apparently healthy carthorses from different breeds, age, and gender, from urban areas of Curitiba City (25° 25' 47" S 49° 16' 19" O) and surroundings. Blood samples were collected from April 2005 to June 2006 by venipuncture of jugular vein using sterile tubes without anticoagulant. The samples were then centrifuged at $1500 \times g$ for 5 min, and the serum was separated and stored at -20 °C until serological analysis.

The detection of anti-EIA antibodies was performed by a commercial AGID (Immunodiffusion Kit Test, EIA antigen and standard serum - Bruch Laboratory, São Paulo, BR), according to the manufacturer's instructions, which is officially adopted by the Brazilian Ministry of Agriculture, Livestock and Supply (MAPA) for EIA diagnosis (BRASIL, 2004).

In the present study, anti-EIA antibodies were found in 1/97 (1.03%) horse sample tested. Our findings were similar to those found in horses from Rio de Janeiro (0.74%) (MARTINS et al., 2005). Seroprevalence rates of EIA in horses from Brazil and other Latin American countries varies from 0 to 33.6% using the same commercial test (SILVA et al., 1999; SANTOS et al., 2001; HEINEMANN et al., 2002; JACOBO et al., 2003; ALMEIDA et al., 2006; BORGES et al., 2013; CUTOLO et al., 2014; TAVARES et al., 2014). The differences in the seroprevalence of the EIA may be due to climate variation and environmental factors.

Previous studies have shown that the population dynamics of the vectors influences the EIA infection level, since horse flies (*Tabanidae*) return to the same animal when feed is interrupted, and to the near horse when less than 50 meters apart (BARROS;

FOIL, 2007). Curitiba City is an international model for sustainable development (AMSTRONG, 2002). Its efficient garbage program promotes an adverse scenario for tabanids, which may explain the low EIA prevalence found in our study. In addition, iatrogenic transmission by contaminated blood through syringes or needles is unlikely since carthorses hardly receive vaccines or medication, and even when the owners vaccinate their horses, few horses living together may prevent animal-to-animal transmission.

Environmental and animal policies are critical for prevention and control of infectious diseases. Considering that carthorses move daily throughout the city the dissemination of pathogens, in this case EIA virus, may be increased without active surveillance programs.

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