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Viral infections in horses in Argentina: an overview based on laboratory results

M.A. Vissani [1], C Olguín Perglione [1], S. Miño [1], M. Carossino [2,5], J.M. Micheloud [3], S. Russo [4], M.S. Tordoya [1], M.L. Becerra [1], O. Zabal [1,5], M. Barrandeguy [1,5]

[1] *Instituto de Virología, CICVyA, INTA-Castelar, 1712 Castelar, Buenos Aires, Argentina;* [2] *Gluck Equine Research Center, University of Kentucky, Lexington, Kentucky, USA;* [3] *Servico Especializado de Diagnóstico Veterinario, Estación Experimental Agropecuaria, INTA-Salta, Salta, Argentina;* [4] *Departamento de Rabia y Enfermedades de pequeños animales, Virología Dilab-SENASA, Martinez, Buenos Aires, Argentina;* [5] *Cátedra de Enfermedades Infecciosas, Escuela de Veterinaria, Universidad del Salvador, Pilar, Buenos Aires, Argentina*

Viral infections are a permanent threat for the equine industry worldwide. In the present work we summarized the information, regarding viral diseases of horses, obtained in our laboratory in the last three years (2013-2015). During this period, 260 tissue samples of abortions from 150 breeding farms; 83 nasopharyngeal swabs from 11 outbreaks of respiratory disease in foals and 808 from horses in the pre-export quarantine; 139 stools from 27 cases of diarrhea in foals; 112 semen samples from Equine Arteritis virus (EAV) seropositive stallions and 8 central nervous system (CNS) samples, were submitted for virological studies. Serum samples were submitted for antibody detection of EAV (n: 13,800) and West Nile Virus (WNV) (N: 5,482) from horses in pre-import/export quarantine and from an EAV surveillance program on registered (Stud book, Fomento Equino and Sociedad Rural Argentina) stallions. The diagnosis approach was done by virus isolation on tissue culture or embrionated eggs, and also by detection of viral genome by PCR. Seroneutralization and MAC ELISA were used for EAV and WNV antibody detection, respectively. The described diagnostic tests were conducted following the recommendations of the World Organization for Animal Health (OIE). Equid herpesvirus 1 (EHV1) was detected in 5% (13/260) of the abortions, and in 5 premises this infection generated multiple fetal losses (abortion storms). All EHV1 were characterized as the non-neuropathogenic (A_{2254}) variant. Equid herpesvirus 4 was registered in 36% of the cases of respiratory disease in foals. Influenza virus was not detected in none of the nasopharyngeal swabs analyzed. Diarrhea in young foals due to Rotavirus infection was detected in 48% (13/27) of the cases. EAV was not found in the abortion cases or in the semen samples analyzed. Rabies virus was the cause of neurological disease and death in horses occurred in Salta province, an endemic area of vampire bats (*Desmodus rotundus*). The virus was characterized as antigenic variant 3 (vampire). EAV serology demonstrated that 3% (356/13,800) of the samples analyzed were positive. The EAV positive horses had been either related with the EAV outbreak occurred in Argentina in 2010, or vaccinated, or imported as vaccinated. No "new" EAV positive horses were detected after August 2010. No samples tested positive for WNV were found. The data presented here showed that the horse population in Argentina is exposed to several viral infections; thus, the importance of preventive and control measures as well as the benefits of surveillance programs is emphasized.

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Detection of Equine Infectious Anemia virus by insulated isothermal RT-PCR (iiRT-PCR) assay using the POCKIT ™ Nucleic acid analyzer

M. Barrandeguy [1,4], G. Espasandin [2], I. Alvarez [1], A. Vissani [1], F. Cipolini [2], D. Martinez [2], S. Chung [3], Y. Tsai [3], A. Lee [3], T. Wang [3]

[1] *Instituto de Virología, CICVyA, INTA-Castelar, Argentina;* [2] *Facultad de Veterinaria, Universidad Nacional del Noreste, Corrientes, Argentina;* [3] *Department of Research and Development, GeneReach USA, Lexington, MA, USA;* [4] *Escuela de Veterinaria, Universidad del Salvador, Pilar, Buenos Aires, Argentina*

Equine Infectious Anemia (EIA) is a disease of great concern for the equine industry worldwide. EIA virus (EIAV) infection can result in either an acute or chronic (swamp fever) disease that typically transitions to a life-long, inapparent (asymptomatic) infection. Diagnosis is based on serological testing, being the agar gel immunodiffusion test (AGID) the OIE prescribed test for international trade of horses. To date, the detection of EIAV in the blood by molecular diagnostic assays (e.g. quantitative real-time RT-PCR) has not been implemented for routine diagnosis. Recently, a fluorescent probe hydrolysis-based insulated isothermal PCR (iiPCR) integrated with an optical detection module (POCKIT ™) has been validated for on-site detection of several bacterial and viral infections of veterinary interest in clinical specimens. The aim of this work was to evaluate the performance of an iiRT-PCR targeting the 5′LTR+*gag* gene of EIAV genome using the POCKIT™ platform. Clinical samples included serum, whole blood and buffy coat collected from 165 horses distributed in an endemic (n=53), a sporadic (n=92), and a free (n=20) EIA zone based on previous prevalence studies performed in Argentina. None of the horses included in the study showed clinical signs of disease at the time of sampling. Serum samples were tested by AGID, while whole blood and buffy coat samples were tested by the newly developed EIAV iiRT-PCR and a previously described EIAV real-time PCR (qPCR) assay. The sensitivity of the EIAV iiRT-PCR assay to detect infected horses was assessed on whole blood and buffy coat samples, and compared with the AGID test. A total of 56 and 109 serum samples were AGID positive