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First case report of vesicular stomatitis in the State of Paraíba, Brazil

Primeiro diagnóstico de estomatite vesicular no Estado da Paraíba, Brasil

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Abstract

The present report describes the first case of vesicular stomatitis in the State of Paraíba, Brazil. Records from the Official Veterinary Services of the State of Paraíba were analyzed while responding to a suspected case of vesicular disease at a property (property I) in the municipality of Pombal in which the cattle showed clinical signs and lesions of vesicular disease. Surveillance in the surrounding area revealed similar lesions in cattle at two other properties (II and III). Based on these events, the suspicion was considered well founded, and samples were collected for evaluation at the National Agricultural Laboratory of the State of Pará. The property was interdicted, and those located within a 3 km radius (perifocal) from the focus were inspected. At property I, 42.86% (6/14) of the cattle showed vesicular disease lesions characterized by intense sialorrhea, ruptured oral vesicles, epithelial detachment of the tongue and muzzle, and vesicular lesions in the udder and interdigital space. Similar lesions were detected in cattle at properties II and III, affecting 80.95% (34/42) and 11.54% (3/26) of the animals, respectively. Tissue samples collected from the three properties were positive for the vesicular stomatitis virus (Indiana 3 subtype). The properties were monitored for 21 days after the last infected animal was cured, and afterwards, the three properties were released.

Key words: Vesicular stomatitis, vesicular disease, cattle, State of Paraíba

Resumo

O presente trabalho teve como objetivo relatar o primeiro diagnóstico de Estomatite Vesicular no Estado da Paraíba. Foram analisados os documentos produzidos pelo Serviço Veterinário Oficial do Estado da Paraíba durante o atendimento de uma notificação de suspeita de doença vesicular em uma propriedade (propriedade I) do município de Pombal em que bovinos apresentavam sinais clínicos e lesões compatíveis com doença vesicular. Durante a vigilância das propriedades vizinhas, em outras duas propriedades (II e III) foram encontradas lesões similares. Diante desse quadro, a suspeita foi considerada fundamentada e foi feita a colheita de material para diagnóstico no Laboratório Nacional Agropecuário no Estado do Pará (LANAGRO-PA), interdição da propriedade e investigação das propriedades de um raio de

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3 km (perifocal) em torno do foco. Na propriedade I, 42,86% (6/14) bovinos existentes apresentaram lesões de doença vesicular caracterizados por sialorréia intensa, vesículas rompidas na cavidade oral e desprendimento do epitélio lingual e da mufla, lesões vesiculares no úbere e no espaço interdigital. Nas propriedades II e III foram encontradas lesões similares afetando 80,95% (34/42) e 11,54% (3/26) dos animais, respectivamente. O resultado laboratorial das amostras das três propriedades foi positivo para o Vírus da Estomatite Vesicular subtipo Indiana 3. O monitoramento continuou até 21 dias após a cura clínica do último animal doente quando as três propriedades foram desinterditadas.

Palavras-chave: Estomatite vesicular, doença vesicular, bovino, Estado da Paraíba

Vesicular stomatitis (VS) is one of the vesicular diseases affecting cattle and swine, a category also including foot-and-mouth disease, vesicular exanthema, and swine vesicular disease, and it cannot be clinically distinguished from foot-and-mouth disease (LÓPEZ et al., 1996-1997; BRIDGES et al., 1997; OIE, 2004; BONUTTI; FIGUEIREDO, 2005). This disease plays an important role in animal health programs, particularly in Brazil, where measures to eradicate foot-and-mouth disease are extensive and clinical vesicular exanthema and swine vesicular disease has not been reported.

The causative agent of VS is *Vesiculovirus*, which occurs primarily as two immunologically distinct serotypes, New Jersey and Indiana (OIE, 2004; FREITAS et al., 2008). The Indiana serotype is further classified into three subtypes, Indiana 1, 2, and 3, (FREITAS et al., 2008). Clinical VS was first reported in Brazil in 1964 simultaneously in the States of Alagoas and Pernambuco; the Indiana 3 virus was isolated primarily from horses and mules and, at a lower incidence, cattle (LÓPEZ et al., 1996-1997).

The only epidemiologically important variants of the vesicular stomatitis virus in Brazil are the Indiana subtypes 2 and 3. The Indiana 2 virus was isolated solely in the States of São Paulo and Rio Grande do Sul in two separate episodes occurring 10 years apart, without any evidence of epidemiological connection between them. Since 1979, the Indiana 2 subtype has not been reported elsewhere in Brazil (FERNÁNDEZ; SONDAHL, 1985; LÓPEZ et al., 1996-1997). The Indiana 1 subtype has never been detected in Brazil; however, in São Paulo, 2.5% (28/1099) of the cattle were seropositive for this subtype, but none of the animals showed clinical signs of disease (De STEFANO et al., 2003).

In Brazil between 1966 and 1968, and in 1978, the Indiana 2 subtype was detected in six outbreaks affecting equines; another 27 outbreaks caused by the Indiana 3 subtype occurred between 1964 and 1996, affecting mostly cattle, followed by horses and a low number of goats and swine (LÓPEZ et al., 1996-1997). Between 1996 and 2010, there were a total 667 outbreaks, mostly affecting cattle (OIE, 2011a; OIE, 2011b).

The clinical diagnosis of VS is identical to that of foot-and-mouth disease, vesicular exanthema, and swine vesicular disease (OIE, 2004; BONUTTI; FIGUEIREDO, 2005). In the field, differentiation between VS and foot-and mouth disease may be suggested by infection in horses, as the latter does not affect this species (OIE, 2004; BONUTTI; FIGUEIREDO, 2005). It is also important to distinguish between VS and infectious bovine rhinotracheitis, bovine viral diarrhea, and bluetongue disease (OIE, 2004). In Brazil, vesicular disease has always been neglected and is only considered when performing the differential diagnosis for foot-and-mouth disease (LÓPEZ et al., 1996-1997). However, VS has become more important in recent years due to greater control of foot-and-mouth disease outbreaks and the increased number of notifications of potential vesicular disease outbreaks, including some that were confirmed as VS. Accordingly, the current report described the first case of vesicular stomatitis in the state of Paraíba, Brazil.

Data used in this report were obtained from the archives of the Official Veterinary Service of the State of Paraíba while responding to a suspected vesicular syndrome case in 2010. The archives included disease investigation forms, technical notes, and laboratory results issued by the National Agricultural Laboratory of the State of Pará (LANAGRO-PA).

In June 2010, the Official Veterinary Service responded to a well-founded suspicion of vesicular disease based on the presence of clinical signs and lesions in cattle at a small rural property (Property I) located in Pombal, Paraíba. The response followed the procedures for handling cases of foot-and-mouth disease and other vesicular diseases recommended by the Pan-American Foot-and-Mouth Disease Center (PANAFTOSA, 2007; PANAFTOSA, 2010) and the Ministry of Agriculture (BRASIL, 2007; BRASIL, 2009). A total 14 cattle were inspected and clinically evaluated for lesions in the oropharyngeal cavity, pedal, and ceiling areas. A sample of the tongue epithelium was collected from one bovine, and esophageal-pharyngeal fluid (EPF) and blood samples were obtained from five other animals. In addition, 68 cattle were examined at two different properties (Properties II and III) located within a 3 km radius, and blood and EPF samples were collected from eight animals with lesions. The tissue samples were stored in Vallee liquid (tongue epithelium) or Eagle medium (EPF). The blood samples were centrifuged, and the resulting serum was collected and stored in microtubes, frozen, and immediately sent to LANAGRO-PA.

Samples were processed according to the procedures and protocols recommended by the OIE and the Ministry of Agriculture of Brazil. The tongue epithelium and EPF were examined using indirect sandwich ELISA, and viral isolation with subtype characterization was performed using BHK cell cultures. Serum samples were examined for the presence of the foot-and-mouth disease virus and vesicular stomatitis virus using the ELISA3ABC/EITB technique.

All properties within a 3 km radius of the affected properties were investigated, and all animals, including cattle, goats, sheep, swine, and equines were subjected to a clinical oral and hoof examination.

Table 1 shows the clinical findings from animals at the three rural properties. During the entire observation period, only cattle showed clinical signs and lesions suggestive of vesicular stomatitis. At property I, 42.86% (6/14) of cattle showed clinical signs and lesions characterized by intense sialorrhea, ruptured oral vesicles, detachment of the tongue and muzzle epithelium, and vesicular lesions in the udder and interdigital space. At properties II and III, 80.95% (34/42) and 11.54% (3/26) of cattle, respectively, had older oral lesions (variably sized ruptured vesicles with epithelial detachment), as well as pedal lesions. None of the examined animals were febrile.

Table 1. Properties with animals displaying clinical signs of vesicular stomatitis during three outbreaks in the State of Paraíba, Brazil in 2010.

Property	Bovine			Other species*		
	Existing	Affected		Existing	Affected	
	N	N	%	N	N	%
I	14	6	42.86	3	0	0.00
II	42	34	80.95	64	0	0.00
III	26	3	11.54	90	0	0.00
Total	82	43	52.44	157	0	0.00

* Goat, sheep, swine, and equine.
Source: Elaborated by the authors.

All of the tissue and blood samples tested were negative for the presence of the foot-and-mouth disease virus. However, the VS virus Indiana 3 subtype was identified. Twenty-one days after the final sick animal was clinically cured, the properties were released, and the episode was considered closed according to the standard methodology for control of VS outbreaks (BRASIL, 2009).

The outbreaks in the present report were caused by VS virus, Indiana 3 subtype and confirmed previous case reports first describing isolation of the virus in Brazil in the States of Alagoas and Pernambuco in 1964, which affected horses and mules (ANDRADE et al., 1980; FERNÁNDEZ; SONDAHL, 1985). From 1964 to 1996, VS outbreaks caused by the Indiana 3 subtype were reported in the northeast States of Alagoas, Pernambuco, Ceará, Bahia, Sergipe, and Piauí, affecting primarily cattle, as well as horses (ANDRADE et al., 1980; LÓPEZ et al., 1996-1997). Outbreaks caused by the same virus were also identified in the States of Minas Gerais, Mato Grosso, Goiás, Mato Grosso do Sul, São Paulo, and Rio de Janeiro, and affected mainly cattle, followed by equines, goats, and swine.

The epidemiology of vesicular stomatitis has become increasingly important due to efforts to eradicate foot-and-mouth disease. According to LOPEZ et al. (1996-1997), after the first VS case report in 1964, the Indiana 3 subtype has been regularly detected in Brazil, affecting cattle, equine, swine, and goats. This trend is evidenced by recent confirmed outbreaks between 2005 and 2010 in the States of Mato Grosso (three in 2008), Tocantins (two in 2008 and one in 2009), São Paulo (one in 2005), Goiás (two in 2008), Bahia (one in 2005, 15 in 2006, one in 2007, three in 2008 and one in 2011), Pernambuco (one in 2005, two in 2008, and one in 2011), Ceará (one in 2011), Rio Grande do Norte (one in 2007 and one in 2011), and Piauí (one in 2006 and one in 2008), affecting mainly cattle, followed by equines and swine. Between 1996 and 2004, 338 registered outbreaks of VS were reported (OIE, 2011a), but the virus subtype identity was unknown. In most outbreaks, bovines were the only species affected, thus eliminating a potential differential clinical diagnosis with foot-and-mouth disease (LÓPEZ et al., 1996-1997), as is the case in the outbreaks reported in this study.

During the epidemiological investigation of the outbreaks in Paraíba, it was impossible to identify the origin of the virus, as no significant ingress of animals susceptible to VS was reported at properties within 3 km of the outbreak 30 days prior to disease onset. Several studies report that it is often impossible to identify the source of infection and the reservoirs (De STEFANO et al., 2002; SEPÚLVEDA et al., 2007; FREITAS et al., 2008).

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