STUDY OF VESICULAR STOMATITIS IN SERA OF HORSES COLLECTED IN URUGUAY

Jorge Baltar Tabarez1, Sergio Sallúa Sandoval1, Rosa di Landro Casas1

SHORT COMUNICATION

Vesicular stomatitis viruses (VSV) of the New Jersey (NJ) type and the Indiana (IND) subtype I are endemic in cattle and horses in countries of North and Central America, as well as in Colombia, Ecuador, Peru and Venezuela in South America (2, 9, 10).

The only virus types isolated in cattle and horses in countries of the southern cone of South America have been the IND subtype II in Argentina and Brazil, and IND subtype III in Brazil (3, 6, 8, 10, 11, 13, 14).

In 1982, 104 samples of sera were collected in Uruguay from horses of a slaughterhouse. The sera were analyzed at the Pan American Foot-and-Mouth Disease Center (PAFMDC) by means of the immunodiffusion test and yielded negative results.

In order to detect the possible presence of VSV a preliminary study was undertaken of horse blood samples taken from August through November, 1983, in Uruguay.

Sera: A group of the serum samples were obtained from farm horses, collected at slaughterhouses, other samples were taken from sera drawn from racing, farm and army horses sent by veterinarians to the “Miguel C. Rubino” Veterinary Research Center and to the Veterinary Services Laboratory of the National Cavalry, for use in the Coggins test to detect infectious anemia antibodies in horses.

Table 1 shows the number of sera according to groups, subgroups and geographic area. The origin of the farm horses that arrived at the slaughterhouse is unknown.

According to Uruguay’s General Bureau of Veterinary Services, the estimated horse population amounted to 505,923 animals in 1982 (5).

In Uruguay, the group of horses subject to “veterinary control” consisted of army horses, racing horses, and farm horses. They totalled roughly 2,500, 14,000 and 1,200 horses, respectively. The group of farm horses consisted of approximately 488,223 animals.

It should be emphasized that the group of horses studied should not be considered as representative of the Uruguayan horse population. Therefore, the results may not indicate the VS situation in Uruguay.

Antigens: The PAFMDC supplied the antigens and positive control sera of the NJ and IND II (Ribeirão Strain) types, prepared according to the technique described by Alonso Fernandez et al. (1).

The Ouchterlony double immunodiffusion method (12) was utilized. Plates were prepared with 1% Difco double agar gel in barbitol buffer, using Petri dishes 9 cm in diameter, with a volume of 15 ml per plate. After gelling, seven wells measuring 3 mm in diameter were made, one in the center and 6 equally spaced around it. The distance between wells was 6 mm.

The positive control sera were placed in the central well of the plate and in three alternating wells around the center well. The problem sera were placed in the other wells. The plates were incubated in a wet chamber at 37°C and readings were made 72 hours later.

Results and discussion: All sera studies were negative to VSV antibodies. The validity of the results is restricted by the fact that the horse population’s actual size and geographic distribution, as well as by the absence of a statistically valid sampling plan. Therefore the results obtained

---

1 Dirección de Lucha Contra la Fiebre Aftosa (DILFA), Ministry of Agriculture and Fishing, Ruta 8 Brig. Gral. Juan A. Lavalleja, km 29, Pando, Canelones, Uruguay.
TABLE 1. Distribution of sera by geographic area and by groups. 
August-November, 1983. Uruguay

<table>
<thead>
<tr>
<th>Geographic area</th>
<th>Field Slaughterhouse</th>
<th>Veterinary attention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total group</td>
<td>1014</td>
<td>57</td>
</tr>
<tr>
<td>North</td>
<td>–</td>
<td>2</td>
</tr>
<tr>
<td>Southwest</td>
<td>–</td>
<td>116</td>
</tr>
<tr>
<td>Southeast</td>
<td>–</td>
<td>106</td>
</tr>
<tr>
<td>South</td>
<td>–</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td></td>
<td>103</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

in this first investigation to detect the VS are meaningful only for the sera assayed.

These results complement observations made at the Vesicular Diseases Diagnosis Laboratory of Uruguay's FMD Control Bureau (DILFA) on field samples collected from animals having clinical symptoms of foot-and-mouth disease (FMD). Negative results to FMD virus and to the VS virus were obtained by complement-fixation tests (CF).

The double immunodiffusion (DID) technique was selected for this study in order to avoid the handling of live antigens. It likewise allowed a simple, rapid diagnosis despite its sensitivity limitations and even though there are other proven techniques with greater sensitivity that also utilize inactivated antigens --such as counterimmunoelectrophoresis (CIEF)-- and those that utilize live viruses, such as neutralization in cell cultures and mice (4, 7).

The use of live-antigen diagnostic techniques is not recommended in Uruguay because the disease has never been suspected, either clinically or epidemiologically.

The PAFMDC has developed the DID technique to identify VSV antibodies in problem sera from endemic areas by means of inactivated antigens; similar results have been noted between this method and the mouse protection techniques, which are more sensitive (7). On the other hand, studies (7) have shown that the antigenic differences between the VSV-NJ group and the VSV-IND group (I, II and III) can be determined by the DID test. But strong cross reactions are observed among the components of the VSV-IND group, and serum neutralization techniques should be used for their typing. The studies comparing the DID and serum micro-neutralization tests for the VSV-IND type III have shown that a relevant number of sera having high neutralization titers were negative in DID tests.

Greater certainty of the absence of VSV in Uruguay will require complementary serological studies based on a statistically representative sampling that covers in detail the aspects of the geographical distribution of the horse and cattle populations. It will also be necessary to support the diagnosis by utilizing techniques with greater sensitivity --such as the ELISA or serum neutralization tests-- to detect low concentrations of antibodies. The latter test must be conducted in a reference laboratory to prevent the escape of live viruses during handling.

ACKNOWLEDGEMENTS

The authors are grateful to Prof. Col. Luis Lavarello, to the Frigorífico CLAY S.A., and to the staff of the Dirección de Industria Animal and of the Pan American Foot-and-Mouth Disease Center.
SUMMARY

During the months of August through November, 1983, a total of 1,643 sera were collected and processed. The sera were taken from horses classified into two groups according to their origin as either farm horses killed at slaughterhouses, or as racing, farm and army horses that had received veterinary attention.

The study used the double diffusion in agar gel technique tested against the inactivated antigens of the New Jersey (NJ) and Indiana (IND) vesicular stomatitis (VS) viruses. All the samples studied yielded negative results. As this is a preliminary and not a representative study, inferences on the absence of VSV in Uruguay may not be made, although VS has not been detected clinically and serologically.

REFERENCES