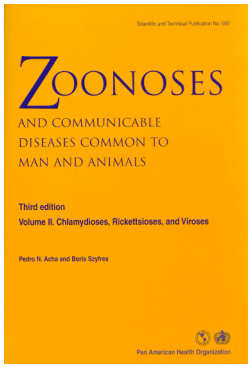

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VENEZUELAN HEMORRHAGIC FEVER

ICD-10 A96.8 Other hemorrhagic fevers caused by arenaviruses

Etiology: Guanarito virus is a new member of the Tacaribe complex, genus *Arenavirus*, family Arenaviridae (for more details on this family, see the chapter on Argentine Hemorrhagic Fever).

Geographic Distribution and Occurrence: In September 1989, an outbreak of hemorrhagic disease occurred in the municipality of Guanarito, Portuguesa State, in the central plains (Los Llanos) of Venezuela. The disease was thought to be dengue until the Guanarito virus, with characteristics of an arenavirus, was isolated.

A total of 104 suspected cases were recorded between May 1990 and March 1991, and 26 of those patients died. They were all rural inhabitants of the municipality of Guanarito in the state of Portuguesa and adjacent areas of the state of Barinas. In 1992, sera from 195 persons in the endemic area were examined, and 2.6% of them had antibodies to Guanarito virus. These preliminary observations suggest that the prevalence of infection is relatively low, whereas the proportion of persons who become gravely ill is relatively high (Tesh *et al.,* 1993). Epidemiological information suggests that Venezuelan hemorrhagic fever **(**VHF**)** behaves cyclically, with high-incidence epidemics occurring every four to five years (Salas *et al.,* 1998). The period of peak incidence is from November to January, the months of high agricultural activity in the endemic region (de Manzione *et al.,* 1998). Few cases are reported during the interepidemic periods (Salas *et al.,* 1998).

When the Guanarito virus was isolated and found to have characteristics of an arenavirus, researchers thought the reservoir might be a rodent, as in the case of the other arenaviruses. When 11 wild rodents were captured for the purpose of a small epidemiologic study, Guanarito virus was isolated from the hispid cotton rat *Sigmodon hispidus*, and antibodies to this agent were found in rice rats of the genus *Oryzomys* (Salas *et al.,* 1991). Tesh *et al.* conducted a broader investigation in 1992 (see Source of Infection and Mode of Transmission).

The Disease in Man: Fifteen patients from Guanarito, ranging in age from 6 to 54 years old, were the subject of clinical, virologic, and serologic studies (Salas *et al.,* 1991). The most salient symptoms were fever, prostration, cephalalgia, arthralgia, cough, pharyngitis, nausea, vomiting, diarrhea, epistaxis, bleeding gums, menorrhagia, and melena. Other symptoms were conjunctivitis, cervical adenopathy, facial edema, pulmonary crepitation, and petechiae. Most of the patients had thrombocytopenia and leukopenia. Nine of the 15 patients died. Autopsy revealed lesions similar to those of other South American hemorrhagic fevers caused by arenaviruses: pulmonary edema with intraparenchymatous and subpleural hemorrhages, hepatic congestion with focal hemorrhages, cardiomegaly, splenomegaly, and blood in the gastrointestinal tract, bladder, and uterus.

Guanarito virus was isolated from the serum and spleen of all the deceased patients and from two of those

who survived.
In a study of 57 family contacts of the patients, the indirect immunofluorescence test revealed antibodies to Guanarito virus in 10.5% of them. Some of these contacts reported having had a mild febrile disease, which could indicate the existence of less severe forms of the infection.

Source of Infection and Mode of Transmission: In 1992, field investigations were expanded with a view to determining the reservoir of the infection (Tesh *et al.,* 1993). Traps were used to capture 234 rodents of 9 different species in 4 areas of the municipality of Guanarito where human cases had occurred. The virus was isolated from the spleens of 31 rodents of two species – specifically, 19 of 40 specimens of the cotton rat *S. alstoni*, and 12 of 106 specimens of the cane mouse *Zygodontomys brevicauda*. Nine of the 12 *Z. brevicauda* from which the virus was isolated also had serum antibodies to the same agent. On the other hand, none of the *S. alstoni*, from which the virus was isolated in the spleen, were serologic reactors. These findings suggest that *S. alstoni* is a host that develops a persistent infection without immunity, whereas *Z. brevicauda* responds to the infection by forming antibodies. The authors (Tesh *et al.,* 1993) concluded that *S. alstoni* is probably the main reservoir of Guanarito virus. Other research has pointed to *Z. brevicauda* as the natural reservoir of the virus, as viremia in this species can be chronic, with persistent shedding of infectious virus in oropharyngeal secretions and urine (Fulhorst *et al.,* 1999).
As with other arenaviruses, man probably acquires the infection by contact with infected rodents and their excreta.

Diagnosis: The virus and its antiserum cross-react with other members of the complex in the complement fixation and indirect immunofluorescence tests, but the serum neutralization test is specific and serves to differentiate Guanarito fever from the other hemorrhagic fevers caused by arenaviruses. Definitive diagnosis is achieved by isolating and identifying the virus. The virus grows well in Vero cells or mosquito cells (C6136). The virus is lethal for suckling mice but not for the adults.

Control: As with all the hemorrhagic diseases caused by arenaviruses, tests for virologic diagnosis should be performed in high-security laboratories.

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