Should we be concerned about Venezuelan hemorrhagic fever? – A reflection on its current situation in Venezuela and potential impact in Latin America amid the migration crisis

Alfonso J. Rodríguez-Morales1,2,4,5,6, D. Katterine Bonilla-Aldana2,3,4, Alejandro Risquez5,7, Alberto Paniz-Mondolfi5,8,9,10,11,12 and José Antonio Suárez5,13
1) Grupo de Investigación Biomedicina, Faculty of Medicine, Fundación Universitaria Autónoma de las Américas, Pereira, Risaralda, 2) Comité on Tropical Medicine, Zoonoses and Travel Medicine, Colombian Association of Infectious Diseases (ACIN), Bogota, 3) Semillero de Zoonosis, Grupo de Investigación GISCA, Fundación Universitaria Autónoma de las Américas, Sede Pereira, 4) Institución Universitaria Vías del Américas, Pereira, Risaralda, Colombia, 5) Comité on Travel Medicine, Pan-American Association of Infectious Diseases (API), Panama City, Panama, 6) Master of Clinical Epidemiology and Biostatistics, Universidad Científica del Sur, Lima, Peru, 7) Faculty of Medicine, Universidad Central de Venezuela, Caracas, 8) Department of Infectious Diseases and Tropical Medicine, Clínica IDB Cabudare, Instituto de Investigaciones Biomédicas IDB, Barquisimeto, 9) Infectious Diseases Research Branch, Venezuelan Science Incubator and the Zoonosis and Emerging Pathogens Regional Collaborative Network, Cabudare, 10) Laboratorio de Señalización Celular y Bioquímica de Parasitos, Instituto de Estudios Avanzados (IDEA), Caracas, 11) Academia Nacional de Medicina, Caracas, Venezuela, 12) Molecular Microbiology Laboratory, Department of Pathology, Molecular and Cell-based Medicine, The Mount Sinai Hospital-Icahn School of Medicine at Mount Sinai, New York, USA and 13) Investigador SNI Senacyp Panamá, Clinical Research Department, Instituto Commemorativo Gorgas de Estudios de la Salud, Panama City, Panama

Abstract

Venezuelan Haemorrhagic Fever is an endemic zoonosis exhibiting a high lethality. Discovered decades ago, it is still causing seasonal hemorrhagic fever outbreaks. With the ongoing migration crisis, transmission and spreading to other countries in Latin America remains a latent threat that should be monitored, particularly in light of recent cases.

Keywords: Guanarito virus, reemerging, rodent-borne diseases, Venezuelan hemorrhagic fever, zoonoses

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Corresponding author: Alfonso J. Rodríguez-Morales, Grupo de Investigación Biomedicina, Faculty of Medicine, Fundación Universitaria Autónoma de las Américas, Pereira, Risaralda, Colombia
E-mail: arodriguezmo@cientifica.edu.pe

Tropical diseases have reemerged in Venezuela as a consequence of an unprecedented humanitarian crisis [1,2], coinciding with a complex growing migration crisis from Venezuela to other Latin American countries. Although malaria, HIV, tuberculosis, and more recently yellow fever [1–4], have been highlighted through publications, and alerts by PAHO; other infections such as Venezuelan Hemorrhagic Fever (VHF) [5], continue to be overlooked. We discuss the current epidemiological situation of this Mammarenavirus and its potential implications in view of the current migratory situation.

VHF is a viral haemorrhagic zoonosis with a high fatality rate (~30%). The disease is caused by the Guanarito Mammarenavirus (species of the Mammarenavirus genus), which includes 40 species of the family Arenaviridae (order Bunyavirales) [6,7]. Like other family members, the Guanarito virus is known to spread through endemic rodents [8–10]. In VHF-Venezuelan endemic areas, some of them also serve as reservoirs for other viruses of the Bunyavirales order, Orthohantaviruses, such as Caño Delgadito.

Although VHF human-to-human transmission has not been reported, other Mammarenavirus in Latin America, like the Chapare virus, is known to spread through human-to-human transmission [7]. The seasonal emergence of the Guanarito virus, poses a latent risk for the spread of imported cases to the region; 118 suspected cases have been investigated in Venezuela, in states in close proximity to the Colombian border. Of them, 36 have been confirmed (30.5%) (Fig. 1). In Venezuela, the icteric haemorrhagic febrile syndrome occurs more often in adult males.
exerting agricultural activities. Because of overlapping areas of endemism with other icterohaemorrhagic pathogens, the differential diagnosis in the country includes other clinically relevant conditions such as leptospirosis, dengue and yellow fever, among others that, although not currently under surveillance, should also be considered (e.g. rickettsiosis).

The most recent 2021 yellow fever outbreak has underscored the potential implications and relevance for disease surveillance in Venezuela [3], despite the availability of an effective vaccine. In contrast, no vaccines nor effective treatments are currently available for VHF, although ribavirin has shown slight clinical improvement for some cases. Despite its seasonality, the recent emergence of VHF cases should not be underestimated and should be considered a public health concern, not only for Venezuela but for the region. Further, by performing a search in PubMed, it becomes evident that there has been a significant lack of published studies on VHF over the last years. VHF tends to exhibit cyclic haemorrhagic fever peaking every 5-to-7 years. So far, the PAHO has yet not issued an alert regarding VHF.

Mammarenaviruses, such as VHF in Venezuela and other endemic countries, have important implications for public health [7]. Although imported cases have not been reported to date, cases of other Mammarenaviruses in returning travellers from other endemic countries have been described in the USA, Canada and Europe [8]. There is a pressing need to fill in the gap of knowledge on the diverse ecological and epidemiological aspects of Mammarenaviruses in Latin America, especially in Venezuela, where a complex humanitarian and migratory crisis continues to evolve, carrying the potential menace for disease importation through exodus given that the risk of exposure amongst domestic and international travellers and people living in rodent-disease endemic areas exists. Therefore, a differential diagnostic approach of viral haemorrhagic fevers is helpful, particularly among travellers returning from areas like rural Venezuela, where the Guanarito virus is endemic. Like for most viral haemorrhagic fevers, early diagnosis of cases is a key feature for outbreak responses and disease contention.

FIG. 1. Geographic distribution of Venezuelan Haemorrhagic Fever cases in Venezuela, 2021 (up to the Epidemiological Week 42); cases were confirmed by RT-PCR at Virology Reference Laboratory in Caracas. Apure, Barinas and Portuguesa are endemic for Zygodontomys brevicauda, Sigmodon alstoni and S. hispidus, who serve as natural reservoirs of the virus. Source: Dirección de Vigilancia Epidemiológica, Ministerio del Poder Popular para la Salud (Ministry of Health of Venezuela).
Transparency declaration

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References

[1] Suárez J, Carreño L, Paniz-Mondolfi A, et al. Infectious diseases, social, economic and political crises, anthropogenic disasters and beyond: Venezuela 2019 – implications for public health and travel medicine. Rev Panamericana de Enferm Infec 2018;1:73–93.

[2] Grillet ME, Hernandez-Villena JV, Llewellyn MS, Paniz-Mondolfi AE, Tami A, Vincent-Gonzalez MF, et al. Venezuela’s humanitarian crisis, resurgence of vector-borne diseases, and implications for spillover in the region. Lancet Infect Dis 2019;19:e49–61.

[3] Rodríguez-Morales AJ, Bonilla-Aldana DK, Suárez JA, Franco-Paredes C, Forero-Peña DA, Mattar S, et al. Yellow fever reemergence in Venezuela – implications for international travelers and Latin American countries during the COVID-19 pandemic. Travel Med Infect Dis 2021;102192.

[4] Rodríguez-Morales AJ, Bonilla-Aldana DK, Morales M, Suarez JA, Martinez-Buitrago E. Migration crisis in Venezuela and its impact on HIV in other countries: the case of Colombia. Ann Clin Microbiol Antimicrob 2019;18:9.

[5] Salas R, de Manzione N, Tesh RB, Rico-Hesse R, Shope RE, Betancourt A, et al. Venezuelan haemorrhagic fever. Lancet 1991;338:1033–6.

[6] Charrel RN, de Lamballerie X. Zoonotic aspects of arenavirus infections. Vet Microbiol 2010;140:213–20.

[7] Escalera-Antezana JP, Rodriguez-Villena OJ, Arancibia-Alba AW, Alvarado-Arnez LE, Bonilla-Aldana DK, Rodriguez-Morales AJ. Clinical features of fatal cases of Chapare virus hemorrhagic fever originating from rural La Paz, Bolivia, 2019: a cluster analysis. Travel Med Infect Dis 2020;101589.

[8] Milazzo ML, Cajimat MN, Duno G, Duno F, Utrera A, Fulhorst CF. Transmission of Guanarito and Pirital viruses among wild rodents, Venezuela. Emerg Infect Dis 2011;17:2209–15.

[9] Tesh RB, Wilson ML, Salas R, De Manzione NM, Tovar D, Ksiazek TG, et al. Field studies on the epidemiology of Venezuelan hemorrhagic fever: implication of the cotton rat Sigmodon alstoni as the probable rodent reservoir. Am J Trop Med Hyg 1993;49:227–35.

[10] Alvarez E. Difusión del conocimiento de la fiebre hemorrágica venezolana (FHV) en los ámbitos académicos, profesionales y culturales del país. Observador del Conocimiento (ONCTI) 2021;6:12–31.