Letter to the Editor

Rift Valley Fever (RVF): is there a global concern on this emerging zoonotic and vector-borne disease?

Juanita Gómez-Pérez,[1] Valentina Londoño-Rodas,[1] Carolina Hincapié-Gañan,[1] Camila Saavedra-Bustamante,[1] Juan Alejandro Gaviria-Ramírez,[1] Andrés Mauricio Patiño-Barbosa,[2,3] Alfonso J. Rodríguez-Morales.[1,2,3,4*]

[1]*School of Veterinary Medicine and Zootechnics, Faculty of Health Sciences, Universidad Tecnológica de Pereira, Pereira, Risaralda, Colombia.*
[2]*School of Medicine, Faculty of Health Sciences, Universidad Tecnológica de Pereira, Pereira, Risaralda, Colombia.*
[3]*Public Health and Infection Research Group, Faculty of Health Sciences, Universidad Tecnológica de Pereira, Pereira, Risaralda, Colombia.*
[4]*Universidad Privada Franz Tamayo/UNIFRANZ, Cochabamba, Bolivia.*

Rev Panam Enf Inf 2018; 1(1):51-52.

Received 1 August 2018 - Accepted 27 August 2018.

Rift Valley Fever (RVF) is a disease caused by the Rift Valley Fever virus (RVFV), which is member of the Bunyaviridae family, Phlebovirus genus. RVF a viral zoonosis that primarily affects animals but can also infect humans. This one affects mainly domestic ruminants, causing large epizootics, with high rates of lethality in young animals and abortions in infected females [1]. The virus was first identified in 1931 during an investigation into an epidemic among sheep on a farm in the Rift Valley of Kenya [2].

This disease is currently present in Africa and in the Arabian Peninsula. However, different factors, such as globalization and climate change have facilitated the introduction of the virus into areas that were previously unrelated, through the vectors of animals or mosquitoes as well human cases [3], as recently occur with an imported case in China [4]. The consequences of its introduction depends on environmental factors, the availability of susceptible ruminants and the ability of local mosquitoes to transmit the virus [3].

In addition to animals, RVF affects humans in a highly variable degree. Manifestations can be in a wide variety of clinical signs and symptoms and compromise including hepatitis, retinitis [5], delayed-onset encephalitis, and in most cases, hemorrhagic disease.

The global fatality rate is estimated between 0.5 and 16% [3,6]. In the cases where the human patient develops with jaundice, neurological disease or hemorrhagic complications there is increased risk of death [7].

RVF is transmitted by arthropods. Vaccination helps to minimize the severity and incidence of outbreaks in the ruminant population. But the introduction of several vaccinated ruminants in areas free of this virus can trigger an outbreak and this disease can become endemic if there is a sustained use of live vaccines [8].

The presence of these outbreaks and their increase are associated with the “El Niño” phenomenon, which increase the number of mosquitoes and allow a greater spread of the disease are a matter of concern [3].

Mosquitoes are excellent vectors for RVF, mainly those from the genuses *Culex* and *Aedes*, which are vectors of a large number of viruses (dengue, chikungunya, Zika, yellow fever, equine encephalitis viruses) [9-12], with their implications for animal and human health.

RVF is considered a globally significant disease that already affects both animals and humans.

In the case of animals, especially cattle animals, this disease is characterized by a high level of abortions and lethality rates, the latter being 100% in neonates and 10% to 20% in adult animals.

Knowledge about RVF risk areas is essential to prevent and control this disease. It should be taken into account the fact that being a disease transmitted by

mosquitoes makes the association between RVF and vector dynamics and its geographical distribution.

The ecology of the vectors depends significantly on the environment, each mosquito species requires specific environmental conditions for development and survival, such as the availability of water for the eggs, the temperature for the development of the aquatic stage or vegetation for some species [13].

On 2018, WHO releases its list of priority pathogens that have the potential to cause a public health emergency, given that for them there is no, or is insufficient, countermeasures, such as drugs and vaccines that help control outbreaks. RVF was discussed and considered for inclusion in the priority list, given the fact that poses a major public health risks and further research and development is needed, including surveillance and diagnostics.

Experts considered that given their potential to cause a public health emergency and the absence of efficacious drugs and/or vaccines, there is an urgent need for accelerated research and development for RVF and other emerging and reemerging conditions [14].

As WHO warned, RVF should be watched carefully and efforts in research should lead to a better understanding and evidence-based information that would mitigate this emerging arboviral and zoonotic disease.

Acknowledgments

This paper was developed in the context of the course Research IV (Investigación IV-VZ781), of the program of Veterinary Medicine and Zootechnics of Universidad Tecnológica de Pereira (Semester 2018-1).

Conflicts of Interest: Alfonso J. Rodríguez-Morales participated as Expert Participant in The 2018 Annual Review of the WHO R&D Blueprint Priority List of Diseases, WHO HQ Avenue Appia 20, 1211 Geneva, Switzerland, 6th and 7th February 2018.

References

1. Boushab BM, Fall-Malick FZ, Ould Baba SE, Ould Salem ML, Belizaire MR, Ledib H, et al. Severe Human Illness Caused by Rift Valley Fever Virus in Mauritania, 2015. Open forum infectious diseases. 2016 Oct;3(4):ofw200.
2. Coetzer JA. The pathology of Rift Valley fever. II. Lesions occurring in field cases in adult cattle, calves and aborted foetuses. The Onderstepoort journal of veterinary research. 1982 Mar;49(1):11-7.
3. Vloet RPM, Vogels CBF, Koenraadt CJM, Pijlman GP, Eiden M, Gonzales JL, et al. Transmission of Rift Valley fever virus from European-breed lambs to Culex pipiens mosquitoes. PLoS neglected tropical diseases. 2017 Dec;11(12):e0006145.
4. Shi Y, Zheng K, Li X, Li L, Li S, Ma J, et al. Isolation and phylogenetic study of Rift Valley fever virus from the first imported case to China. Virologica Sinica. 2017 Jun;32(3):253-6.
5. Freed I. Rift valley fever in man, complicated by retinal changes and loss of vision. South African medical journal = Suid-Afrikaanse tydskrif vir geneeskunde. 1951 Dec 15;25(50):930-2.
6. Yassin W. Clinico-pathological picture in five human cases died with Rift Valley fever. The Journal of the Egyptian Public Health Association. 1978;53(3-4):191-3.
7. Kahlon SS, Peters CJ, Leduc J, Muchiri EM, Muiruri S, Njenga MK, et al. Severe Rift Valley fever may present with a characteristic clinical syndrome. The American journal of tropical medicine and hygiene. 2010 Mar;82(3):371-5.
8. Chamchod F, Cosner C, Cantrell RS, Beier JC, Ruan S. Transmission Dynamics of Rift Valley Fever Virus: Effects of Live and Killed Vaccines on Epizootic Outbreaks and Enzootic Maintenance. Frontiers in microbiology. 2015;6:1568.
9. Martinez-Pulgarin DF, Acevedo-Mendoza WF, Cardona-Ospina JA, Rodriguez-Morales AJ, Paniz-Mondolfi AE. A bibliometric analysis of global Zika research. Travel medicine and infectious disease. 2016 Jan-Feb;14(1):55-7.
10. Rodriguez-Morales AJ. Zika: the new arbovirus threat for Latin America. Journal of infection in developing countries. 2015 Jul 4;9(6):684-5.
11. Musso D, Rodriguez-Morales AJ, Levi JE, Cao-Lormeau VM, Gubler DJ. Unexpected outbreaks of arbovirus infections: lessons learned from the Pacific and tropical America. The Lancet Infectious diseases. 2018 Jun 19.
12. Alfaro-Toloza P, Clouet-Huerta DE, Rodriguez-Morales AJ. Chikungunya, the emerging migratory rheumatism. The Lancet Infectious diseases. 2015 May;15(5):510-2.
13. Pachka H, Annelise T, Alan K, Power T, Patrick K, Veronique C, et al. Rift Valley fever vector diversity and impact of meteorological and environmental factors on Culex pipiens dynamics in the Okavango Delta, Botswana. Parasites & vectors. 2016 Aug 8;9(1):434.
14. World Health Organization; List of Blueprint priority diseases. 2018 [cited 4-4-2018]; Available from: www.who.int/blueprint/priority-diseases/en/

Corresponding Author: Alfonso J. Rodríguez-Morales. Public Health and Infection Research Group, Faculty of Health Sciences, Universidad Tecnológica de Pereira, Pereira, Risaralda, Colombia. Email: arodriguezm@utp.edu.co