Exploring the burden of Ntwetwe virus – A novel orthobunyavirus associated with CNS infections – In Ugandan children

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Background: Ntwetwe virus is a novel orthobunyavirus which was recently discovered from the cerebrospinal fluid of a three-year-old Ugandan girl with a fatal CNS infection. Orthobunyaviruses are arthropod-borne viruses, are prevalent worldwide and can cause different types of disease, ranging from mild febrile illness to fatal CNS infections. It is expected that human exposure to Ntwetwe virus may be common because of its presumed vector (the Anopheles mosquito) and the high seroprevalence to its closest relative (Tataguine virus) in sub-Saharan Africa. Nonetheless, because of its recent discovery, attempts to further study this virus have not yet been performed. The objective of this study is to determine the prevalence of Ntwetwe virus infections in children in the region where the virus was first identified and describe the clinical characteristics of infected cases. Moreover, this study aims to determine whether and which mosquitoes transmit Ntwetwe virus. This information will provide us with the first insight into the burden of Ntwetwe virus infections which will be important for clinicians, policy makers and future research.

Methods and materials: We conducted a human case–control study on children presenting with mild febrile and severe neurologic symptoms – each linked to a healthy control – to Kiboga hospital between August 2019 and January 2020. Infection by Ntwetwe virus was determined by a quantitative real-time polymerase chain reaction (RT-qPCR) of blood and cerebral spinal fluid samples in the Uganda Virus Research Institute. The prevalence of acute Ntwetwe virus infections for both case groups was compared to healthy controls. For Ntwetwe virus positive patients, clinical and anthropological risk factors for infection were determined by comparison to patients negative for Ntwetwe virus. Mosquitoes were captured at two time points by field teams from the UVRI using CDC light traps over a period of 2 weeks in the area surrounding Kiboga hospital during the dry and rainy season.

Results: Fifteen cases (14 mild and one severe) and five controls were included by mid October 2019. Further inclusion and testing is ongoing.

Conclusion: Results of this study will – for the first time – be presented at the ICID.