Epidemiology of Crimean-Congo hemorrhagic fever virus and West Nile virus among febrile patients in Ijara and Garissa districts, Kenya.

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ABSTRACT

Crimean-Congo hemorrhagic fever (CCHF) is a viral tick-borne zoonotic disease caused by CCHF virus (CCHFV), a member of the *Bunyaviridae* family, *Nairovirus* genus. West Nile is a vector-borne disease caused by West Nile virus, a member of the *Flaviviridae* family, genus *Flavivirus* and is transmitted by infected mosquitoes. Both diseases have similar symptoms with many other febrile illnesses such as Malaria, viral hepatitis, Yellow fever, Chikungunya, Rift Valley Fever, Brucellosis, Leptospirosis and Typhoid fever. Many patients who present in hospitals in Kenya with acute febrile illness are empirically treated for malaria; leading to misdiagnosis and wrong treatment. Ticks and mosquitoes collected as part of broad entomologic arboviruses surveillance established the presence of CCHFV and WNV in the ticks and mosquitoes populations. However, evidence of transmission to humans did not exist. This study was carried out in order to determine if CCHFV and WNV had been transmitted to humans and also the epidemiology of these two viruses in Ijara and Garissa districts in Garissa County, Kenya. This was a descriptive cross sectional laboratory based study. The samples were obtained from patients who presented with acute febrile illness in health facilities in Ijara and Sangailu divisions in Ijara district (April-July,2010) and also samples collected during the Rift Valley Fever outbreak of (2006-2007) from Garissa district .ELISA was used to detect presence of IgM and IgG antibodies. Questionnaire for demographic, clinical and geographical characteristics was also filled for each patient. Data analysis was done using Epi Info software version 3.3.2 the frequencies of different variables like age, sex, occupation and associated factors and Ms excel to draw graphs. All of the samples screened for CCHFV by IgM ELISA were negative whereas 26 out of 346 (7.5%) samples were IgG ELISA positive (95% confidence interval: 5.1-10.9). Of the IgG positives, the prevalence was high among the males (8.6%)

compared with females (6.5%). The most affected age group for CCHF IgG positive was 20-29yrs (42.3%). Herdsmen were more likely to have IgG antibodies (9.2%) than housewives (7.0%) and businessmen (0.0%). CCHFV exposure was significantly associated with herding animals (P=0.026), travelling outside the village (P=0.032) and contact with camels (P< 0.05). All of the 346 serum samples screened for WNV for IgM ELISA were negative. 48 out of 346 samples were found to be WNV IgG ELISA positive. The point estimate prevalence was 13.9% (95% confidence interval: 10.5-18.1). This study is one of the few extensive sero-surveys showing the extent of human exposure to CCHFV (7.5%) and WNV (13.9%) in Kenya. This evidence of human infection necessitates awareness creation among public health officers on the disease existence, training on disease management and outbreak response. Further investigations on the scope of the disease in other regions with similar reservoir hosts like domestic animals, sheep, goats, camels and vectors like *Hyalomma* spp are critical for disease management and control.