

Genetic and serological evidence of Crimean-Congo Hemorrhagic Fever Virus circulation in Ticks and Cattle in North Central Nigeria.

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Abstract

Crimean - Congo haemorrhagic fever virus (CCHFV) is a tick-borne viral haemorrhagic febrile disease that is highly pathogenic in humans with enzootic cycle between tick vectors and animal hosts. Human infection with CCHFV takes the clinical form of viral haemorrhagic disease, a major health condition but with limited testing in Nigeria. In this study, blood samples were collected from 333 pastoralists' cattle in North Central Nigeria and 1,470 ticks were picked from the animals. For serology, Enzyme Linked Immuno Sorbent Assay (ELISA) was performed using a double antigen multi species ELISA kit with sensitivity and specificity of 98.9% and 95% respectively at 95% confidence interval to detect IgG antibody to CCHFV in plasma. RT-qPCR virological technique was used to identify viral antigen in ticks that were pooled based on location and genus. Four species of ticks were morphologically identified to parasitize cattle in the sampled location namely; *Rhipicephalus* (*Boophilus*) *decoloratus* (34.6%), *Hyalomma truncatum* (32.9%), *Amblyomma variegatum* (24.6%) and *Rhipicephalus sanguineus* (8%). The seroprevalence of CCHFV was found to be 67%. In Kaduna state, 85 of 108 plasma samples tested positive (78.7%) while in Plateau state 138 of 225 plasma samples tested positive (61.3%). Of the 41 pools of tick tested for CCHF, one (1) pool of 35 *Rhipicephalus* (*Boophilus*) ticks (2.4%) was positive for CCHF virus with qPCR cycle threshold of 31.88. Although *Hyalomma spp.* is documented to be the main vector of CCHFV, in the present investigation, *Rhipicephalus* (*Boophilus*) species was identified to play a role as reservoir of CCHF. The high seroprevalence of CCHF in livestock underscores the public health risk associated with CCHFV at the human-animal interface in Nigeria.

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