PREVALENCE AND RISK FACTORS OF AFRICAN HORSE SICKNESS IN THE DONKEY POPULATION OF KIAMBU WEST DISTRICT, KENYA.

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ABSTRACT

African Horse Sickness (AHS) is an infectious, non-contagious insect-borne disease of equids caused by the AHS virus. Although the disease has been detected in horses and zebra, information on the prevalence of the disease and associated risk factors in donkeys in Kenya was not available.

The current study was conducted to determine the prevalence and risk factors for AHS in donkeys in Lari and Limuru divisions of Kiambu West District, Kenya. Three sublocations in each of the two divisions were selected randomly. Households with donkeys in the study sublocations were re-ordered randomly and visited to collect household information and
bleed donkeys for serology. Blood samples were collected from donkeys after heavy rains in May-June; and in the dry season in August-September, 2010.

Serum from 398 donkeys was tested for AHS antibodies using competitive antibody ELISA (Enzyme Linked Immuno-Sorbent Assay). The risk factors and level of awareness of AHS were assessed through a questionnaire used to interview 146 donkey owners. Data were analyzed using Genstat® and Stata® for descriptive statistics, and Mixed Models Logistic Regression respectively, to estimate the prevalence and risk factors for AHS. The kappa statistic was computed to measure the level of agreement between clinical diagnosis of AHS and the c-ELISA results.

The sero-prevalence of AHS in donkeys sampled after the heavy rains was estimated at 35.2% (70/199); 95% CI (28.5, 41.8) for the two divisions, while that for the dry season was estimated at 27.6% (55/199; 95% CI 21.4, 33.9). The prevalence of AHS in the donkeys that were re-sampled in Kambaa, decreased from 60% (18/30; 95% CI 42.5, 77.5) in May/June to 20% (6/30; 95% CI 5.7, 34.3) in August/September. This difference indicated a waning immunity.

Division and sub-location were controlled for in the mixed models logistic regression analysis of the risk factors. In the univariate analysis, age of the donkeys, presence of a water stream, source of the donkey, donkey use, vaccination status and housing were the statistically significant variables and were thus included in the multivariate analysis. Age of the donkey (donkeys (9-12 years) had a higher prevalence; 40.7% (81/199)) (p-value 0.02)
and presence of a water stream (p-value 0.03) were significant risk factors and might have contributed to the high prevalence of AHS among donkeys in Kambaa and Rwamburi sublocations. A water stream likely favored increased vector(s) population, and transmission of the AHSV.

Three donkeys observed with clinical AHS had fever (39°C), weakness, dyspnea, seromucoid nasal discharge, congestion and oedema of conjunctiva, swollen heads and eyes with protrusion of the supra-orbital fossae. These findings dispute previous reports of donkeys as asymptomatic carriers or showing disease signs of transient fever. The poor agreement (k =0.05) between the c-ELISA and clinical diagnosis of AHS indicated that absence of clinical signs did not mean that a donkey was not infected with AHSV. Although the c-ELISA test was diagnostic for AHS, the kit is expensive and is not available in Kenya. The low level of awareness of AHS (21.8%) should be addressed in future donkey health and welfare services.

The study indicated that AHS is endemic in donkeys in the 6 sublocations of Lari and Limuru divisions of Kiambu West District. An outbreak was reported in donkeys in the neighboring Kikuyu Division (reported in a separate manuscript), further justifying the need for research on clinical and epidemiological patterns of AHS in donkeys in other parts of Kenya.

It was therefore suggested that information on this study be disseminated widely in appropriate media in order to sensitize more people about the disease in donkeys. In addition, control methods like vaccination of donkeys against the disease and targeted vector control especially in the wet season were proposed in order to reduce the prevalence of the disease.