Mokola Virus Antibodies in Humans, Dogs, Cats, Cattle, Sheep, and Goats in Nigeria

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KEY WORDS: Mokola virus antibodies, human, animals, Nigeria

ABSTRACT

Using the ELISA method, a survey of Mokola virus antibodies was carried out in human and selected animal population in Nigeria. A total of 10 sheep (2%), 15 goats (3%), and 59 dogs (10.54%) tested positive for Mokola virus antibodies. However, none of the humans, cats, or cattle tested was positive.

INTRODUCTION

Mokola virus, a virus belonging to the family Rhabdoviridae and genus *Lyssavirus*, is serologically and morphologically similar to the rabies virus.[1] The virus was first isolated in Ibadan, Nigeria, in 1968 from shrews.[2] Other members in the genus *Lyssavirus* include rabies, Duvenhage, Kotonkan, Lagos bat, Obodhiang, and Oulo-Fato viruses. Because infection with the Mokola virus produces clinical signs that are similar to classical rabies virus, the Mokola virus infection may be confused with rabies virus infection.[3] Despite the serological and morphological similarities between rabies and rabies-related viruses, it is known that vaccination against the rabies virus does not necessarily protect against the rabies-related viruses, hence their presence complicates efforts in the control of rabies.[4] Mokola virus neutralizing antibodies had earlier been detected in humans and dogs in Nigeria.[4] The aim of this present work is to determine the current status of Mokola virus neutralizing antibodies in humans, dogs, cats, and farm animals such as cattle sheep and goat in Nigeria. This is because of the public health importance of the disease caused by Mokola virus infection to humans and also to animals that live in close proximity with their owners.

MATERIALS AND METHODS

Blood samples were collected from Oyo, Osun, Ogun, Ondo, Ekiti, and Lagos states of Nigeria. Samples from the dogs and cats were collected from major veterinary clinics while those of sheep and goats were collected from household units. Samples from cattle were collected from cattle markets in the areas of study. Samples from humans were collected from major hospitals in the aforementioned states. About 6 mL of blood were collected by venopuncture into a dry and sterile tube containing no anticoagulant. The blood was allowed to clot at room temperature for about 3 hours before separating the serum by centrifugation at 3,000 rpm for 10 minutes. The serum samples were stored at –20°C until analyzed. The samples

were thereafter analyzed using the Enzyme Linked Immunosorbent Assay (ELISA) technique as described by Aghomo et al.[5]

RESULTS

The findings in this study are presented in Table 1. Of all the species sampled, dogs had the highest percentage of positive sera (10.5%). Sheep and goats were 2% and 3%, respectively. However, none of the humans, cats, or cattle sampled was found to have antibodies to the Mokola virus.

Table 1. Species with Mokola antibodies.

Subjects	Number sampled	Number positive	Percentage (%)
Human	100	0	0.0
Cattle	400	0	0.0
Sheep	500	10	2.0
Goat	500	15	3.0
Dogs	560	59	10.5
Cats	25	0	0.0

DISCUSSION

In this study, Mokola virus neutralizing antibodies were found in dogs, sheep and goats in the locations of study. This is partly similar to the finding of Ogunkoya et al[4] who detected Mokola virus neutralizing antibodies in Nigerian dogs and Kemp et al[2] who detected same in goats. Ogunkoya et al[4] reported the presence of Mokola virus neutralizing antibodies in humans while Kemp et al[2] reported the presence in the serum of cattle, but in this study, there were no neutralizing antibodies detected in cattle. Human serum samples tested by Kemp et al[2] were negative just as recorded in this study. The higher levels of Mokola virus neutralizing antibodies recorded in this work from sheep and goats might be due to the fact that the sheep and goats sampled in this study were from household units where they come freely in contact with dogs and shrew rats, which are known to be the vectors of Mokola virus. The high prevalence of Mokola virus neutralizing antibodies in dogs might explain the occurrence of rabies like clinical manifestation in some vaccinated dogs in Nigeria, which had earlier been reported by Bobade et al.[6] Such manifestations also could have been as a result of infection with other rabies-related viruses. In this present work, none of the humans sampled was positive for Mokola virus antibodies. However, the possibility of a few isolated cases of Mokola virus infection in man can not be ruled out. Recently, a young lady who showed rabies-like clinical signs was reported to have recovered from the illness.[7] Because of the public health importance of Mokola virus infection, further work is required to determine the epizootiology of the disease in Nigeria.

ACKNOWLEGEMENT

The authors are grateful to the University of Ibadan senate for funding this project (grant no. SRG/FVM/2000/7A).

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