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Detection of lyssavirus antigen and assessment of the levels of anti-rabies antibodies in unvaccinated, apparently healthy and rabies-suspect dogs

B M Anene¹, U U Eze¹, E C Ngoepe², R C Ezeokonkwo³, C N wosuh¹, C T Sabeta^{2,4}

¹University of Nigeria, Nigeria

²Agricultural Research Council-Onderstepoort Veterinary Institute, South Africa

³University of Nigeria, Nigeria

⁴University of Pretoria, South Africa

Rabies is an acute and progressive encephalitis caused by members of the genus *Lyssavirus* (Family Rhabdoviridae, order Mononegavirales). An estimated 59 000 human deaths occur annually in Africa and Asia, with the majority of these deaths due to dog bites. In this study, we undertook a cross-sectional survey for the presence of lyssavirus antigen in brain tissues and anti-rabies antibodies in sera of unvaccinated, apparently healthy and rabies-suspect dogs slaughtered for consumption at local markets in South Eastern Nigeria. Samples (both brain tissues and serum) from 278 dogs were tested for lyssavirus antigen and rabies antibodies, using the direct fluorescent antibody test (DFA) and a commercial enzyme-linked immunosorbent assay (ELISA), respectively. Twenty three brain tissues (8.3%) were shown to contain lyssavirus antigen, whereas 2.5% (n=25) of the serum samples had anti-rabies antibodies. There was an inverse relationship between the presence of lyssavirus antigens and levels of rabies antibodies. The inverse relationship between the presence of lyssavirus antigens and levels of rabies antibodies underscores the notion of immune evasion following lyssavirus infection. The low percentage of anti-rabies antibodies in the dog population studied suggests a dog population susceptible and at very high risk to rabies virus (RABV) infection. These findings indicate a big challenge to local and global rabies elimination efforts considering that most of the dog population in Africa is confined to the rural areas where parenteral dog vaccination is not routinely or adequately undertaken.

Boniface.anene@unn.edu.ng