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LYSSAVIRUS SURVEILLANCE IN DOGS IN SOUTH-EAST NIGERIA: APPLICATION OF MOLECULAR AND IMMUNOLOGICAL ASSAYS

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The direct fluorescent antibody test (DFA) is the standard test for the diagnosis of both animal and human rabies. This test detects lyssavirus antigen on brain-infected tissues and central nervous tissues including salivary glands. In this study, we used the molecular quantitative real-time reverse transcription polymerase chain reaction (RT-qPCR) and immunologic direct rapid immunohistochemical test (dRIT) as alternatives to DFA. A total of 278 specimens were initially subjected to DFA. The specimens were brought in two batches: the first batch consisting of 260 brain and salivary gland tissue specimens collected from dog markets in South East Nigeria from October 2015 to July 2016, and the other comprising 18 brain specimens from rabies-suspect dogs from both veterinary hospitals and dog markets. From the first batch, 10 brain and 7 salivary gland samples were DFA positive. Thereafter, the 10 DFA positive brain samples and the 10 salivary gland samples from the DFA positive brain tissues and the 18 samples from rabies-suspect dogs (n=28) were subjected to DFA, dRIT and RT-qPCR. Using DFA, dRIT and RT-qPCR, 82.1% (n=23), 100% (n=28) and 96.4% (n=27) were positive for lyssavirus antigen, respectively. Then, of the 10 salivary gland samples tested, 70% (n=7), 90% (n=9) and 20% (n=2) were positive for DFA, dRIT and RT-qPCR, respectively. In this study, dRIT gave similar result (100%) with the molecular RT-qPCR. This shows that dRIT is a highly sensitive diagnostic test for rabies diagnosis and was superior to the DFA. The RT-qPCR is highly sensitive as it was able to detect very low lyssavirus concentration in brain tissues. The discordance of the DFA and dRIT results underscore that rabies is under-reported in Africa considering that many laboratories do not have the capability to undertake molecular analysis.

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