

Sensitivity and specificity of the Negri body test using Sellers' stain in the diagnosis of rabies in dogs

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Rabies is an invariably fatal zoonotic viral disease which infects all mammalian species. Dog rabies is the main source of infection for human disease. Confirmation of rabies infection requires laboratory testing of brain tissue and therefore, laboratory diagnosis of dog rabies is of paramount importance in surveillance and control of rabies. Negri body test using Sellers' stain is a simple and cheap diagnostic technique but information with regard to its efficacy is scanty. A study was therefore, conducted to determine the effectiveness of the Negri body test using Sellers' stain in diagnosis of rabies in dogs.

Impression smears from the hippocampus, cerebellum and brain stem from each of the brain from a total of 96 dogs suspected of having rabies were stained with Sellers' stain and examined for the presence of Negri bodies under oil emersion (X100) of light microscope. As the control, impression smears from all the brain samples were also subjected to fluorescent antibody testing (FAT) which is the WHO recommended gold-standard test for confirmation of rabies. The laboratory results and animal data collected using sample submission forms were analyzed statistically using ANOVA with SAS 9.1.3 and Minitab 15 with statistical significance set at $p < 0.05$.

Of the 96 brains examined, 27 (28.13%) were positive for Rabies by FAT. Sensitivity of Negri body test was found to be 85.2% as 23 of those FAT positive brains contained Negri bodies. Shape of the Negri bodies varied from round to oval and there was a significant ($p < 0.05$) difference between the number of Negri bodies in the Hippocampus (25.48 ± 15.11) in comparison to the number in the cerebellum (12.61 ± 4.8) and brain stem (12.26 ± 4.7) but, there was no significant ($p < 0.05$) difference between the number among cerebellum and the brain stem. The sizes of the Negri bodies varied from 0.1 to 0.8 μm . But there was no significant ($p < 0.05$) difference variation between the sizes of Negri bodies in each location as the means of Negri bodies of hippocampus, brain stem and cerebellum were $0.246 \pm 0.084 \mu\text{m}$, $0.234 \pm 0.0636 \mu\text{m}$ and $0.239 \pm 0.071 \mu\text{m}$ respectively. None of the FAT negative brain smears contained any Negri bodies indicating 100% specificity of the Negri body test.

The present findings indicate that Negri body test using Sellers' stain is a highly specific test that can be used in diagnosis of the dog Rabies particularly in peripheral laboratories. Hippocampus is the preferable area for sample collection as it has the highest number of Negri bodies. However, due to its relatively low sensitivity the Negri body test negative samples need to be retested using FAT.

Key words: Rabies, Negri bodies, Sellers' Staining, Sensitivity, Specificity