

RESEARCH NOTE

NEUROLOGICAL SYMPTOMS IN A CAT FOLLOWING VACCINATION WITH HIGH EGG PASSAGE FLURY RABIES VACCINE OF CHICKEN EMBRYO ORIGIN

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ABSTRACT

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The development of neurological symptoms in a cat following vaccination with the high egg passage Flury rabies vaccine and the subsequent isolation of a virus with characteristics consistent with the criteria for distinguishing the high egg passage Flury strain of rabies virus are described.

Résumé

SYMPTÔMES NEUROLOGIQUES APPARAISSANT CHEZ UN CHAT APRÈS INOCULATION D'UN VACCIN ANTIRABIQUE "HIGH EGG PASSAGE FLURY" PRÉPARÉ À PARTIR D'EMBRYONS DE POULET

On décrit le développement de symptômes neurologiques chez un chat après sa vaccination avec le vaccin antirabique "high egg passage Flury" et l'isolement subséquent d'un virus dont les caractéristiques s'accordent avec les critères qui permettent de reconnaître la souche "high egg passage Flury" du virus rabique.

INTRODUCTION

Several modified live virus rabies vaccines are in use throughout the world and cats may be effectively immunized with any of these with the exception of the low egg passage (LEP) Flury strain which occasionally proves too pathogenic (Dean, Sherman & Goodrich, 1959; Vaughn & Gerhardt, 1961; WHO, 1966). However, the high egg passage (HEP) Flury vaccine of chicken embryo origin (CEO) is claimed to be perfectly safe and is recommended for the immunization of cats (WHO, 1973). No previous report on the development of rabies-like symptoms in a cat following vaccination with this type of vaccine could be traced. The purpose of this report is to describe the development of neurological symptoms in a cat following vaccination with the HEP Flury vaccine of CEO and the characterization of the virus isolated from the brain of the cat.

MATERIALS AND METHODS

Case report

During September 1976, rabies was diagnosed in 2 dogs from a densely-populated area in the northern suburbs of Pretoria. During the ensuing two months all the dogs (27 125) and cats (9 800) in the area were vaccinated against rabies, the LEP Flury vaccine of CEO being used for dogs and the HEP Flury vaccine of CEO for cats. During the 2 months following vaccination, specimens from 21 cats with suspected rabies were presented at the Veterinary Research Institute for laboratory investigation.

The history of the only positive case was as follows: The cat concerned was a 6-year-old queen which developed paralysis of the inoculated hind leg 16 days after vaccination. On day 17 both hind legs were affected and the paralysis soon became general. The cat was presented at the Faculty of Veterinary Science of the University of Pretoria for treatment, but, as rabies was suspected, the cat was killed and its carcass submitted to the Veterinary Research Institute, Onderstepoort the following day for confirmation of the diagnosis.

Standard rabies diagnostic techniques were employed. The cat's brain was unfortunately too decomposed for histopathological examination, but impression smears made from different portions of the brain and stained with the direct fluorescent antibody technique for rabies (FATR) revealed brilliantly fluorescing, fine, dust-like particles. Intracerebral inoculation of brain suspension into 3-week-old mice yielded negative results. The inoculation of brain suspension into the yolk-sac of 7-day-old embryonated hen's eggs incubated at 36,5°C did not lead to embryo mortality, but the FATR performed on different embryos harvested on Day 7 after inoculation showed brilliant fluorescence in the chorio-allantoic membrane, yolk-sac and brain. The fluorescing structures varied in size from barely visible to large inclusion bodies. Yolk-sac suspensions of the egg-adapted cat strain were stored at -15°C for comparison with other rabies strains (see below).

In view of the vaccination history, the fine, dust-like fluorescence observed in the cat's brain, the negative biological test in 3-week-old mice and the positive results in the embryonated eggs, the possibility that the HEP vaccine was responsible for the neurological symptoms in the cat was seriously considered. Further laboratory investigations were therefore performed in an attempt to confirm this supposition.

Virus characterization

The behaviour of the virus isolated from the cat in embryonated eggs was compared in various hosts with the Flury HEP and LEP vaccine strains and with the rabies virus isolated from one of the dogs mentioned.

Yolk-sac suspensions of all 4 virus strains were titrated by intracerebral inoculation in day-old and adult mice and by intramuscular inoculation in guinea pigs, the results of which are given in Table 1. The similarity in behaviour between the cat virus isolate and the HEP Flury vaccine strain is evident.

Two susceptible kittens were also inoculated intramuscularly in the hind leg with 10^{5.5} mouse LD₅₀ of cat virus infected chicken embryo suspension, but no untoward reaction could be noticed in either of the kittens while kept under observation for 40 days.

NEUROLOGICAL SYMPTOMS IN A CAT FOLLOWING VACCINATION WITH RABIES VACCINE

TABLE 1 Comparison of four different rabies virus strains in 3 different hosts

Virus	Mouse LD ₅₀ of chicken embryo suspension in:		
	Baby mice	Adult mice	Guinea pigs
Cat isolate.....	10 ^{4,7}	ND*	ND
HEP Flury strain.....	10 ^{5,5}	ND	ND
LEP Flury strain.....	10 ^{5,0}	10 ^{3,8}	ND
Street virus.....	10 ^{2,3}	10 ^{2,2}	10 ^{1,8}

ND=No deaths

DISCUSSION

The virus isolated from the brain of the cat that exhibited neurological symptoms behaved quite differently from street rabies virus. It was non-pathogenic for 3-week-old mice, guinea-pigs and kittens, although it was pathogenic for new-born mice, and multiplied quite readily in embryonated eggs, producing relatively high virus titres. The properties of this virus

isolate are similar to those of the HEP Flury vaccine strain and, in view of the vaccination history, an aetiological role for the vaccine is strongly indicated.

Although the HEP Flury rabies vaccine of CEO has been regarded as absolutely safe for use in cats, the results reported in this paper seem to indicate that under certain undefined conditions this vaccine may also be pathogenic for the domestic cat.

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