

TITLE: Comparison of subcutaneous and intramuscular administration of a live attenuated distemper virus vaccine in ferrets

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SPRAY, hydroject and parenteral routes are effective procedures for vaccinating ferrets and mink with attenuated canine distemper virus vaccine. Of the three, parenteral administration is the most common procedure. Vaccinating mink is a hectic operation; when vaccinating mink at a rate of 800 per hour, the operator is generally not concerned about the depth of needle penetration.

It has been reported that subcutaneous vaccination of modified live virus rabies vaccine evoked a poor immune response in dogs (Merry and others 1969, Brown and others 1973). On the other hand, DomorizkovA and others (1982)' found that the percentage of seroconversion using attenuated live virus measles vaccine given by the intramuscular and subcutaneous routes was similar.

Because of occasional instances of failure to immunise mink against distemper, the efficacy of the subcutaneous and intramuscular routes of vaccination was compared.

The Rockborn strain of canine distemper virus was used. The virus had been passaged for 40 serial passages in dog kidney cells and 10 passages in Vero cells.. After virus propagation the cell culture fluid suspension, which contained 50 Rg/mi gentamicin sulphate was clarified at 1500 g for 30 minutes.

The supernatant fluid was used as the vaccine. It had a titre of 10⁴-9 TCID₅₀/mi in Vero cells. Seven-month-old domestic ferrets, *Mustella putorius furo*, were used.

Nine serial two-fold (1 in 200 to 1 in 51,200) dilutions were prepared in phosphate buffer solution from this vaccine. Ten ferrets were injected subcutaneously and 10 ferrets injected intramuscularly from each dilution. Each ferret received 1 ml of inoculum. One month following vaccination, each vaccinated ferret along with 10 unvaccinated control ferrets were challenged intramuscularly with 100 ferret lethal doses 50 of Green's ferret passaged distemper virus

Purulent conjunctivitis, nasal exudate, skin rash, profound depression, anorexia and death were the criteria of distemper virus infection. The clinical diagnosis was verified by histological examination of the urinary bladder for distemper virus inclusions.

TABLE 1: Results of pathogenic distemper virus challenge following vaccination of ferrets

Reciprocal of vaccine dilution	Estimated number of TCID 50 ml	Vaccine route and results of challenge	
		Subcutaneous	Intramuscular
200	416	0/10*	0/10
400	208	0/10	0/10
800	104	0/10	0/10
1,600	52	0/10	0/10
3,200	26	0/10	0/10
6,400	13	2/10	1/10
12,800	6.5	2/10	2/10
25,600	3.2	2/5	2/5
51,200	1.6	5/5	4/5
Diluent only	-	5/5	5/5

*Number of animals which died of distemper/number exposed

The results of the challenge are shown in Table 1. It is apparent that there is no difference in the immunisation potential of the vaccine when the two different routes of administration were compared. The 50 per cent immunising dose of the Rockborn strain vaccine for ferrets was estimated at 2.95 TCID 50 intramuscularly and 2.78 TCID 50 given subcutaneously. These findings are consistent with immunisation studies by Cabasso and others (1959) and Svehag and Gorham (1962) in which an estimated 1.6 EID 50 Lederie egg propagated and 2 EID 50 of the Wisconsin FXNO viruses respectively immunised ferrets.

Mink and ferrets are equally susceptible to distemper virus. Ferrets were used as experimental animals for this trial because of their availability in this laboratory. The results indicate that administration routes should not be a factor for concern in vaccination procedures of distemper virus vaccine for mink, ferrets or, perhaps, dogs.

References

- BROWN. A. L., MERRY. D. L. & BECKENHAUER. W. H. (1973) *American Journal of Veterinary Research* 34. 1427
- CABASSO. V. J., KISER. K. & STEBBINS. M. R. (1959) *Proceedings of the Society of Experimental Biological Medicine* 100 551
- FOMORAZKOVA. E., DRENKO. M., BERGKIANNOVA. V., STF-HLIKOVA. M. & SLONIM, D. (1982) *Czechoslovakia. Pediatrics* 37. 19
- MERRY. D. L., Jr., BROGAN. A. L. & BECKENHAUER, W. H. (1969) *Veterinary Medicine; Small Animal Clinician* 64. 76
- SVEHAG. S.-E. & GORHAM. J. R. (1962 - 63) *Archiv für die Gesamte Virusforschung* 12. 250