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Antibody Response to Canine Distemper Vaccine in African Wild Dogs

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ABSTRACT: Antibody levels against canine distemper virus were measured by means of an immunofluorescent antibody test prior to, and after, administration of a modified-live virus booster vaccine to seven African wild dogs (*Lycaon pictus*). Positive seroconversion with no harmful side-effects was seen in all the animals.

Key words: wild dogs, distemper virus, modified-live virus vaccine, immunofluorescent antibody test.

Canine distemper (CD) is an acute to subacute contagious systematic disease with a high mortality rate in domestic dogs (*Canis familaris*) and other carnivores throughout the world (Appel, 1987). Many different species in the order Carnivora are susceptible to CD and the mortality rate varies greatly among species (Appel and Gillespie, 1972).

African wild dogs (*Lycaon pictus*) are susceptible to infection with canine distemper virus (CDV) (Van Heerden et al., 1980), and are best protected against this disease by vaccination (Appel, 1987). However, disease and death from vaccine induced CD has been reported in African wild dog litters (Durchfeld et al., 1990). Currently, the numbers of African wild dogs in the wild are diminishing. Increasingly, these animals are being kept in captive breeding programs where they inadvertently may be exposed to canine diseases. This has necessitated the need for effective vaccines to protect this endangered species against these diseases.

The present study group, a pack kept for breeding at the De Wildt Cheetah Research Centre of the National Zoological Gardens of South Africa, Pretoria, South Africa (25°44′S, 28°12′E) has been vaccinated for several years using the Vanguard 5 vaccine (SmithKline Animal Health, Halfway House, 1685, South Africa). This vaccine contains modified live canine parvovirus, canine parainfluenzavirus, canine adenovirus type 2 and canine distempervirus. To date there have been no obvious side effects from this vaccine, but Van Heerden et al. (1980) observed a lack of seroconversion to live vaccine. Our objective was to measure the antibody response to distemper in this vaccine in wild dogs.

Seven dogs were bled prior to booster vaccination and again 1 mo post-vaccination. Antibody levels were measured by means of an immunofluorescent antibody test (IFA) using commercially available slides onto which canine distemper-infected cells were fixed (VMRD Inc., Pullman, Washington, USA). Serum samples were diluted 1:100 in phosphate buffered saline and the fluorescent reaction was scored from a weak (±) to a very strong (3+) response (Spencer, 1991).

All seven dogs had at least a two-fold increase in antibody titer as measured qualitatively by an IFA test (Table 1). This would suggest the efficacy of the present vaccine as a management tool in captive wild dog populations.

TABLE 1. Canine distemper indirect fluorescent antibody test results of African wild dog sera following booster vaccination with a polyvalent vaccine containing canine parvovirus, adenovirus, and distempervirus.

Dog No.	Pre-bleed	Post-bleed
1	+[a]	2+
2	+	2+
3	+	3+
4	±	2+
5	+	2+
6	±	2+
7	+	2+

[a] Serum samples were diluted 1:100, and scored from a weak (±) positive to a very strong (3+) response (Spencer, 1991).

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Use of multivalent vaccines can induce lymphopenia in domestic dogs (Appel, 1987). Post-vaccination immunosuppression with clinical distemper as a secondary complication also has occurred in African wild dogs (Durchfeld et al., 1990). There was no evidence of other diseases or any other side effects which might indicate immunosuppression with the use of Vanguard 5 vaccine, indicating its safety in non-domestic populations.

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