Vaccine Reactions: Treatment and Prevention

A.V.M.A. and C.V.M.A. say yearly boosters

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WHY VACCINATE YEARLY?

There have been recent discussions in the news about whether or not pets are over-vaccinated. The policies of the American Veterinary Medical Association (A.V.M.A.) and the Canadian Veterinary Medical Association (C.V.M.A.) state that ferrets should receive canine distemper virus (C.D.V.) and rabies vaccines yearly.

A safe ferret is a vaccinated ferret. The A.F.A. vaccination protocol recommendations are sent to all new members and are available from the A.F.A. office

In response to concerns about over-vaccination, there is ongoing research into vaccine titers, the concentration of antibodies toward a disease that is present in the blood. The titers indicate whether the antibody concentration is adequate to prevent disease in the animal. Tests are available for dogs, but unfortunately it is difficult to access enough blood (2–3 mL per test) from most ferrets to monitor titer concentrations without subjecting the animal to anesthesia. There is also evidence that titer concentrations do not correlate well to the body's level of immunity against the rabies virus.

Other ongoing research is looking at vaccine challenges. Vaccine challenges involve exposing a vaccinated animal to a specific virus to determine whether enough antibodies are present in the animal's immune system to prevent an infection. Until this research has been completed, it is recommended to continue to follow the vaccination policies of the A.V.M.A. and the C.V.M.A.

VACCINE RESPONSES

The purpose of a vaccine is to stimulate the body's production of antibodies against the pathogen in the vaccine, thereby increasing the body's immunity to that pathogen in the future. Therefore, a vaccine cannot protect against future infection without first triggering an immune response.

A ferret's immune system must respond to a vaccine in order for its immunity against a specific disease to be strengthened. Acceptable signs of a vaccine reaction in ferrets are slight lethargy and a raised bump at the vaccination site. Unfortunately, any vaccine can cause a life-threatening allergic response in any animal, and ferrets are no exception.

More severe vaccine reactions can range from a mild episode of vomiting and diarrhea to death from anaphylactic shock. All species have a "shock organ," the bodily system that is primarily affected by an anaphylactic reaction to a stimuli, including vaccines. The shock organ in ferrets is the gastrointestinal system. This gastrointestinal response is why the clinical signs of a vaccine reaction include vomiting and diarrhea, which may be bloody. Ferrets may also develop erythematous (reddened) skin due to capillary dilatation and high fever. This adverse reaction may progress quite quickly to circulatory collapse (shock), one of the more severe manifestations of anaphylaxis, and death. At the first sign of allergic reaction, a ferret must be treated immediately to prevent the rapid deterioration into circulatory collapse. Inject diphenhydramine (Benadryl, Parke-Davis, Morris Plains, N.J.) 0.5–2.0 mg/kg either intravenously or intramuscularly, dexamethasone sodium phosphate 0.5–2.0 mg/kg, and, if the reaction is severe, epinephrine 20 µg/kg intravenously, intramuscularly, subcutaneously, or down the endotracheal tube if the ferret is unconscious. Also, supportive care, including intravenous fluids, oxygen, and a warm environment, must be administered if indicated.

Due to the severity of the vaccine reaction in some ferrets, I usually ask my patients to stay in the office for a half an hour after a vaccine is administered. If a ferret has an allergic reaction, life-saving treatment can be initiated immediately. A vaccine reaction can occur at any time in a ferret's life but is more commonly seen in the younger ferret. Severe reactions can occur up to 30 minutes after administration of a vaccine. These responses are called "immediate hypersensitivity re-

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MEDICAL NEWS

Long and Short of It

A Cautionary Word about Febreze™

by Cindy Sooy, Newark, Del.

There is a relatively new product on the market called Febreze™. It is made by Proctor and Gamble and is sprayed on fabric to remove odors. There have been quite a few incidents reported recently on the Internet about pets that have allegedly died after their owners used Febreze™ on their bedding. According to an April 16 statement by the American Board of Veterinary Toxicology (A.B.V.T.), "There is no substantiated evidence that the use of Febreze™ [has] caused the death of any dogs or cats" (http://www.napcc.aspca.org/febreze2.htm).

There have also been some Internet reports of birds dying when Febreze™ has been used properly in their areas. Birds are extremely sensitive to any airborne substances, and their owners are cautioned not to use air fresheners, cleaners, scented candles, hair spray, carpet fresheners, or any aerosol sprays in the vicinity of the birds or their cages. Febreze™ is perfumed, so it is then easy to see how Febreze™ may be unsafe for use in households with birds. A.B.V.T. and Procter and Gamble caution that birds should be removed from the room until any product application has dried and the room has been fully ventilated. There is no evidence that Febreze™ should be treated differently from other household cleaning products in the presence of birds.

But what about ferrets? Is it possible that Febreze™ could cause problems with ferrets? Ferrets are small, so even tiny amounts of a product could have adverse effects on them. Proctor and Gamble cautions that owners should wait until the product is completely dry before allowing pets to access the sprayed area. This is excellent advice when using cleaners or sprays of any type in the ferrets' cage or play area. Evidence suggests that Febreze™, when used properly, is safe for use around pets. Use caution, never spray it directly on an animal, and never let an animal into an area that is still wet with the product.

An older formula of Febreze™ contained zinc chloride, which is a lung irritant, but according to Procter and Gamble, the amount of zinc chloride used was minimal and the Internet rumors about Febreze™ started after zinc chloride was eliminated from the product. More information about Febreze™ from Proctor and Gamble is available at http://febreze.com/pet.html.

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actions" and are different from "delayed-type hypersensitivity reactions," which may be observed up to 72 hours following vaccination. Any reactions should be reported to the veterinarian, who can determine whether follow-up treatment is necessary.

APPROVED C.D.V. AND RABIES VACCINES

Vaccines approved by the U.S Department of Agriculture (U.S.D.A.) for a species have been tested on that species and found to elicit an adequate immune response. If an animal that has been given an approved vaccine is exposed to the live pathogen, it is unlikely that the animal will become infected with the disease. Appropriate ferret vaccines are those that have been tested on ferrets and shown to increase immunity. Vaccines that are not approved for ferrets have not been clearly proven to provide the adequate immune protection.

If you are planning to enter your ferret into a ferret show, you must ask the organizers of the show which vaccines they will accept. Some shows will allow ferrets to participate only if they have been vaccinated with vaccines licensed by the U.S.D.A. for ferrets. [*Ed. Note:* A.F.A. shows require U.S.D.A.-licensed vaccines.]

Only one vaccine against C.D.V. is U.S.D.A.-approved for use on ferrets: FERVAC-D (United Vaccines Inc., Madison, Wisc.). GALAXY-D (Solvay Animal Health, Inc., Mendota Heights, Minn.) is another C.D.V. vaccine commonly given to ferrets, but, per review of the literature, has not yet been tested and proven in laboratory studies to induce an adequate immune response against C.D.V. in ferrets.

Ferrets should be vaccinated against C.D.V. when they are 8, 11, and 14 weeks old and then yearly. Kits 6–14 weeks old with no, unknown, or outdated vaccination history should be given a series of three boosters at three week intervals and then annually on the anniversary of the last booster. Ferrets more than 14 weeks old with no, unknown, or outdated vaccination history should be given two vaccines two weeks apart and then annually on the anniversary of the last booster.

Combination dog vaccines should never be given to ferrets. These vaccines increase dogs' immunity against parvovirus, adenovirus, coronavirus, and leptospirosis. Because ferrets are not susceptible to these viruses, these additional vaccinations are not necessary and, in fact, only burden the ferret's

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immune system when it is trying to generate antibodies to produce resistance to C.D.V. Keep in mind, no vaccine is 100% effective and avoiding exposure to C.D.V. best minimizes the chance of a disease outbreak.

Only one vaccine against the rabies virus has been approved by the U.S.D.A. for use on ferrets: IMRAB-3 (Merial Limited, Iselin, N.J.). Rabies vaccines should be given to ferret kits 14–16 weeks old and then annually. (In dogs and cats, after the first annual rabies booster, the vaccine is administered every three years, depending on state requirements.) As more states (and regions in Canada) offer quarantines for properly vaccinated ferrets involved in bite incidents, it is strongly recommended that IMRAB-3 continue to be given yearly. It is hoped that in the near future, all states and regions will offer rabies quarantines as too many ferrets have already lost their lives to rabies testing.

PREVENTING VACCINE REACTIONS

Most clients choose to have both the C.D.V. and rabies vaccines administered to their ferrets at the same time, making it difficult to know exactly which vaccine caused a reaction. The year following a reaction when the ferret is to be re-vaccinated, the two vaccines should not be administered at the same time. The ferret should also be pre-medicated with diphenhydramine before a vaccine is administered. Some veterinarians also use pre-treatment with dexamethasone to prevent vaccine reactions. [*Ed. Note:* Dexamethasone can successfully prevent vaccine reactions, but there is some controversy among healthcare professionals about whether the drug also blocks a vaccine's effectiveness, making the ferret more likely to contract the disease if later exposed to the live virus.]

If we, as veterinarians and ferret owners, are aware that vaccine reactions can occur and recognize the initial signs, then ferrets that do react can be treated quickly to prevent fatal anaphylactic shock. Until there is sufficient evidence that ferrets can maintain an adequate immune response for a standard period of time, vaccinations against C.D.V. and rabies should be continued annually. Both viruses are nearly 100% fatal to ferrets. Even those ferrets that temporarily survive C.D.V. are horribly affected by the disease. I know that I would feel incredibly guilty if my ferrets came down with these deadly yet preventable diseases because I had failed to provide proper vaccinations.

SOURCES

Hillyer E and Quesenberry K. Ferrets, Rabbits and Rodents Clinical Medicine and Surgery. W.B. Saunders Company 1997;17.

C.D.V. Outbreak in Milwaukee

Ferret Fanciers of Greater Milwaukee recently suffered a devastating outbreak of canine distemper virus among its shelter population. Twenty-three ferrets died. On February 5, the shelter euthanized a ferret named Fauna that was very ill but did not exhibit the classic symptoms of distemper (as described in Cindy Sooy's article on page 11). In less than a week, five ferrets each less than two years old had died. It is believed that the virus was brought into the shelter by a ferret previously held by the local Humane Society.

According to Judy Vowell, shelter director, adoptable ferrets in the shelter had not been vaccinated against distemper per the advice of two area veterinarians, who felt it would be best if the ferrets were first given a chance to recover from E.C.E. before receiving vaccinations. Since the outbreak, the shelter's policy has changed, and all ferrets are immediately vaccinated with Fervac-D (United Vaccines Inc., Madison, Wisc.). Booster shots are also administered.

A contributing factor in this tragedy, according to Vowell, is that many people who surrender ferrets to the shelter claim that their ferrets have been properly vaccinated. The shelter is no longer taking these people at their word. Another problem is that when Milwaukee-area pet stores sell ferret kits, they tell their clients that these ferrets do not need any vaccines beyond the shots given by the breeder. Vowell said this approach makes ferrets easier to sell.

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Vaccine adverse events (serious vaccine reactions) should be reported to the manufacturer or to the U.S. Department of Agriculture. Call collect (515) 232-5789. After hours, call and leave a message. Provide the following information: species, sex, age, reproductive status (intact/neutered), vaccine product name with lot or batch number, expiration date of the product, animal's prior immunization history, status of animal prior to vaccination, description of events, any concurrent medications, outcome. It would also be helpful to know whether the animal had experienced any prior adverse events, had been medicated before the vaccine and with what product, or had an existing condition that may have contributed to the reaction.