Adverse Reactions to Vaccination

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Adverse reactions to vaccination have been recognized for years, and were commonly seen in several human vaccines including polio and smallpox vaccines. Adverse reactions to vaccines also occur in dogs and cats. However, compared to the risks of not vaccinating dogs and cats, the risks associated with vaccinations are very small in comparison. Adverse effects from vaccinations can vary with the type of vaccine used, and the age and breed of animal vaccinated. Anaphylaxis is one of the most serious reactions to vaccines. Some of the more common (but still rare) risks are discussed below. In dogs, young adult small breed dogs receiving multiple vaccinations at the same time had the highest risk of a reaction to the vaccine.

Anaphylaxis

Anaphylaxis is a rare, life-threatening, immediate allergic reaction to something ingested or injected. If untreated, it results in shock, respiratory and cardiac failure, and death. An anaphylactic reaction can occur as a result of vaccination. The reaction usually occurs within minutes to hours (less than 24) of the vaccination. Dr. Ronald Schultz of the University of Wisconsin College of Veterinary Medicine estimates that about one case of anaphylaxis occurs for every 15,000 doses of vaccine administered.

The most common symptoms of anaphylaxis are the sudden onset of diarrhea, vomiting, shock, seizures, coma, and death. The animals' gums will be very pale, and the limbs will feel cold. The heart rate is generally very fast, but the pulse is weak. There can be facial swelling.

Anaphylaxis is an extreme emergency. If you think your dog is having an anaphylactic reaction, seek emergency veterinary assistance immediately. Epinephrine should be given as soon as possible - we are talking within a few minutes. IV fluids, oxygen, and other medications are given as needed.

Anaphylactic reactions are more commonly associated with the use of killed vaccines such as rabies, canine coronavirus, and leptospirosis. Killed vaccines have more virus or bacterial particles per dose and have added chemicals (adjuvants) to improve the dog's immune response. These characteristics also increase the risk of an allergic reaction to the vaccine.

If your dog has ever had a reaction to a vaccine, subsequent vaccinations should be given by your veterinarian. In some cases, certain vaccines may be excluded from your dog's vaccination regimen, a different type of vaccine will be used, or certain drugs, including antihistamines may be given prior to vaccination. The veterinarian may place a catheter in the dog's vein so if a reaction does occur, medications and fluids can be given immediately. Depending on the situation, your dog may need to remain in the veterinarian's office for a period of 30 minutes to several hours. Once home, the dog should be kept under observation for several additional hours. Even with these precautions, life-threatening reactions could still occur.

Neurologic and eye disease

Neurologic symptoms are the most common vaccine reaction seen in dogs. Canine distemper vaccination is the most common cause of neurologic disease, and can cause an inflammation of the brain. Measles vaccine in puppies has been reported to rarely cause damage to the nervous system. Cerebellar disease has been reported in puppies less than 5 weeks of age who were vaccinated with a modified live vaccine.

Canine adenovirus-1 is known to cause an allergic uveitis (inflammation of the eye), often called 'blue eye.' Most vaccines now contain canine adenovirus-2 instead of adenovirus-1, almost eliminating the chance of blue eye occurring today.

Discomfort and swelling at the injection site

Pain, swelling, redness, and irritation can occur at the injection site. These effects generally occur within 30 minutes to 1 week of the vaccination. If the signs persist, or are severe, contact your veterinarian.

Occasionally, abscesses can form at the injection site. These abscesses are generally not caused by infection, but by the body's over-reaction to the vaccine.

Mild fever, decreased appetite and activity

Mild fever, decreased appetite, and depression may be observed for 1-2 days following vaccination, most commonly when modified live vaccines are used. Generally, no treatment is warranted.

Severe illness can occur if vaccines designed for intranasal use are accidentally injected. Severe reactions can also occur if any of a vaccine made for injection accidentally enters an animal's eyes, nose, or mouth.

Respiratory signs after intranasal vaccines

Dogs vaccinated with the intranasal *Bordetella* and/or parainfluenza vaccine may develop a mild cough, which generally does not require treatment. They may spread the vaccine-form of the virus to other animals through their coughing.

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Lameness

Rarely, lameness can result from several different vaccinations.

Immune-mediated polyarthritis in Akitas: Certain lines of Akitas may have immunodeficiencies which make them prone to adverse reactions following vaccination. They may develop an immune-mediated arthritis in one or more joints, which is often progressive and relapses commonly occur. Dogs with this immune disorder generally have short life spans due to other complications.

Hypertrophic osteodystrophy: Certain lines of Weimaraners, and some other large-breed dogs, may develop hypertrophic osteodystrophy following canine distemper vaccinations given between 2 and 5 months of age. They may also develop respiratory signs, enlarged lymph nodes, and diarrhea. The hypertrophic osteodystrophy is treated with glucocorticoids and the signs of the disease usually resolve.

Shedding of vaccine agent

Vaccine virus may be found in the nasal secretions of dogs vaccinated intranasally. In addition, vaccine parvovirus is shed in the feces of vaccinated dogs, canine adenovirus-1 can be shed in the urine, and canine adenovirus-2 can be found in nasal secretions. These viruses are the vaccine forms of the virus; they do NOT revert back to the disease-causing strains.

Birth defects or infections

The vaccination of pregnant animals with a modified live vaccine can result in birth defects or abortions. It is recommended that modified live vaccines NEVER be given to pregnant animals.

Summary

As with any medical procedure, there are always risks of adverse reactions or side effects. These risks must be compared to the benefits of the procedure. Many of the diseases against which we vaccinate can be serious and even lethal. In almost all cases, the risks associated with vaccination are very small compared to the risk of developing disease. As new vaccines and methods of administration become available, the adverse risks of vaccination should be reduced even more.

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