Adverse Reactions to Vaccinations in Cats  
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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 cats and dogs. However, compared to the risks of not vaccinating cats and dogs, 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 and the development of a fibrosarcoma are the most serious reactions to vaccines. Some of the more common (but still rare) risks are discussed below.

**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 cat 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* and *feline leukemia virus*. Killed vaccines have more virus or bacterial particles per dose, and have added chemicals (adjuvants) to improve the cat's immune response. These characteristics also increase the risk of an allergic reaction to the vaccine.

If your cat 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 cat'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 cat's vein so if a reaction does occur, medications and fluids can be given immediately. Depending on the situation, your cat may need to remain in the veterinarian's office for a period of 30 minutes to several hours. Once home, the cat should be kept under observation for several additional hours. Even with these precautions, life-threatening reactions could still occur.

**Vaccine-associated sarcoma**

A fibrosarcoma is a tumor of the connective tissue. These tumors tend to invade deeply into the underlying tissues. The frequency of these tumors is increasing in cats and has led researchers to believe some of the tumors may be caused by a local reaction to a vaccine. Although these tumors are seen more frequently, they are still rare. Current estimates on the incidence of these tumors are about one tumor per 5,000 to 10,000 cats vaccinated. These tumors are most commonly associated with the FeLV vaccine.

Research is ongoing to determine the exact cause of these tumors and how they can be prevented and treated. Possible explanations for the tumors include abnormal reactions to the adjuvant in vaccines, genetic predisposition, and infections with another virus.

The possible risk of vaccine-associated fibrosarcomas has led to a reevaluation of vaccination protocols. This is why it is recommended that adult cats without potential exposure to FeLV may not need vaccination against that disease. In cats with potential exposure, the risk of FeLV infection is greater than the risk of developing a sarcoma so vaccination is advised.

A small, painless swelling sometimes develops at the site of a recent vaccination. This should disappear in several weeks. If it persists, however, it could mean it is developing into a sarcoma and should be checked by your veterinarian. The warning signs for a vaccine-related fibrosarcoma are:

- A lump that persists for more than three months after vaccination.
- A lump that is larger than two centimeters in diameter (2.5 centimeters = 1 inch).
- A lump that ne month after vaccination it is still increasing in size.

If you have any concern regarding a lump at a vaccination site, do not hesitate to contact your veterinarian.

If a vaccine-associated fibrosarcoma develops, surgical removal is attempted, but generally, this tumor is so invasive it is difficult to remove it all. Radiation or chemotherapy are often recommended in combination with surgery.

Generally, the FeLV vaccine is now given in the left rear leg, in an area distinct from where other vaccinations are given. If a tumor would develop, knowing which vaccine was given...
where will help us determine with which vaccine the tumor is associated. Also, if a tumor would develop, amputation of the leg would, in many cases, be curative. Cats do incredibly well on three legs, and many owners prefer this to having their cat succumb to a tumor.

Neurologic and eye disease

Neurologic symptoms are the most common vaccine reaction seen in cats and dogs. Cerebellar disease has been reported in kittens less than 5 weeks of age who were vaccinated with a modified live vaccine.

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 overreaction 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.

Cats vaccinated with some *Chlamydia* vaccines may show weakness, lethargy, lameness, fever, and loss of appetite for 1-3 weeks after vaccination. In some instances, medications such as corticosteroids may be used to help alleviate the symptoms.

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

Cats may develop mild respiratory signs when vaccinated with intranasal *calicivirus* and/or herpes virus (the cause of rhinotracheitis).

Lameness

Rarely, lameness can result from several different vaccinations. Kittens vaccinated with a modified live calicivirus vaccine may develop lameness within 3 weeks of the vaccination. Some kittens may also develop a fever and lose their appetite. These symptoms generally last 3-4 days, and depending on severity, may be treated with fluids, antibiotics, and pain medication.

Birth defects or infections

The vaccination of pregnant animals with a modified live vaccine can result in birth defects or abortions. This is especially true of feline panleukopenia (feline distemper) which can cause a brain defect called 'cerebellar hypoplasia'. In this condition the cerebellum, the portion of the brain that controls locomotion, does not develop properly. Affected kittens often have a head bob and stagger, but otherwise can live normal lives. 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.