

Canine Vaccination and Risk: What Do We Know?

Belief is not the same as knowledge, said George Moore, DVM, PhD, Purdue University, adding, "It is possible to be sincerely wrong." People must test their beliefs, including their beliefs about vaccine safety and protocols.

Two companies recently have published information showing that vaccines for canine hepatitis, distemper, and parvovirus are good for three years instead of the one year previously recommended. These claims will now be subject to testing.

Both the safety and efficacy of vaccines should be evaluated.

"Essentially, as we improve the quality of our vaccines, we also improve the number of vaccines," Dr. Moore said. There are many more animal vaccines and accompanying implications now than there were 20 or 30 years ago. When vaccines are successful in decreasing infections, then it is time to decrease vaccine-associated adverse events (VAAE). As the number of adverse events rises, people stop vaccinating, the disease recurs, and people increase vaccination again to control the disease. For example, a recent outbreak of canine distemper in Chicago occurred because people had stopped vaccinating their dogs against the disease. Safety trials are required before licensing a vaccine for animals, Dr. Moore said. The test involves giving two doses of a vaccine to 500 to 1,500 animals, with a follow-up in less than 30 days. Not looking at repeat vaccinations, having only one follow-up, and having that follow-up within a relatively short time limits the ability of these vaccine trials to recognize adverse events.

"All of a sudden now we get a false sense of security about what might be the safety record of that vaccine, and that's true about vaccines for people as well as about animals," Dr. Moore said. With human vaccines, by law, doctors must report adverse events to the Food and Drug Administration or Centers for Disease Control. That kind of reporting is not required for animal vaccines. The USDA gets about 500 to 600 reports on VAAE a year, mostly on dogs and cats, although more livestock than small animals are vaccinated. Veterinarians are more likely to report VAAE to the vaccine manufacturers than to regulators. Government surveillance on animal vaccines is more passive than active.

Dr. Moore said that prudent questions about VAAE are how often they occur and the frequency for different types of vaccines. VAAE studies must follow a large population over long period. Dr. Moore and his research team looked at the vaccination records of dog patients at Banfield, The Pet Hospital, from January 1, 2002, to December 31, 2003. They considered the breed, age, sex, and neuter status. Vaccines administered included bordetella, borrelia, coronavirus, giardia, rabies, parvovirus, and a multivalent distemper-adenovirus-parainfluenza-parvovirus-leptospirosis (4 serovars). The team searched the animals' records for ailments occurring up to three days post vaccination and checked records for the nature of the reaction. This two-year study, examining 3.5 million doses of vaccine and 1.2 million dogs, found 4,678 adverse events. In 65% of those, the veterinarians called the adverse event a "vaccine reaction," and in 32% an "allergic reaction."

The most common reactions involved facial edema or edema around the eyes, wheals/urticaria, generalized pruritis, or vomiting. The incidence of allergic reaction was greater in smaller dogs. VAAE rates were higher in one-year-old dogs than in dogs two to nine months old, and were greatest in two-year-old dogs. Neutered dogs had higher rates of adverse events than sexually intact dogs.

The rate of VAAE also varied by breed. In each of 42 breeds, more than 5,000 dogs were vaccinated over the two-year study period. Dachshund, Pug, Boston Terrier, Miniature Pinscher, and Chihuahua breeds showed the highest rate of adverse effects.

Rates also increased by almost 25% for each additional vaccine given on the same occasion. The increase was slight but statistically significant in large dogs, with a greater increase in small dogs. Three dogs died in the study; all received four or more vaccines on one occasion. Many dogs that had vaccine reactions did not have repeat reactions with subsequent vaccinations. The risk of VAAE may be higher on these subsequent vaccinations than if there had been no previous reaction, but actual rates of subsequent reactions are not yet known.

More research is needed on adverse reactions, Dr. Moore said. Some of the limitations of the Banfield study were that all vaccines were from one manufacturer, there were no checks for adverse effects more than three days after vaccination, and the study did not consider records of previous vaccinations.

In questions following the presentation, an audience member asked about the benefits of distemper/measles vaccine to prevent the clinical problem of respiratory disease. Dr. Moore said that because most dogs get good protection against these diseases from their mothers and because there is a low incidence of these diseases there doesn't appear to be as much benefit from this vaccine. It is possible that the vaccine helps protect dogs against other respiratory diseases, but there is no conclusive information at this time.

Asked about his recommendation on vaccinating for leptospirosis, Dr. Moore said he currently is involved in a study on the disease. It appears to be established in the wildlife population and now is seen in dogs that never leave their yards. As cities spread into formerly wild areas, dogs get the disease from wild animal contamination. Although the vaccine has side effects, the hazards of the disease—15% to 20% mortality rate from acute renal failure—outweigh the dangers. The lepto vaccine appears to offer long-term protection. Even with undetectable titers, immunity appears to continue.