Puppyatrics - Handling the vaccination reaction

By PJ Broadfoot DVM

In recent years, we have been rather interested to realize that the incidence of hypersensitivity reactions has been increasing in the veterinary practice. This is particularly evident in juvenile puppies, as a result of the vaccination procedures. Though we consider immunization to be of importance in these young animals, due to the ongoing presence of devastating viral diseases such as distemper and parvoviral enteritis, we have continually found ourselves "downsizing" our protocols to a bare minimum, as we have observed an influx of vaccination reactions. Despite reducing the number of "jabs", and limiting the antigens in the vaccines, we still see reactions.

Puppies less than six months old are more susceptible to the common infectious diseases than adults, and therefore are the primary target population for vaccination.[1] In the US, the incidence of clinical disease from distemper, infections hepatitis, and parvovirus in dogs older than one year of age is virtually zero.

High levels of maternal antibodies acquired from ingestion of colostrum protect puppies from disease for the first six to eight weeks of life. Following this, a window of susceptibility to infection is created because maternal antibodies are high enough to interfere with the vaccine-induced response, but not high enough to protect the pup from infection and disease. This is the most common cause of vaccine failure in puppies. Therefore, immunizations are repeated at timed intervals to ensure development of a protective immune response. The pediatric series includes the core vaccines for distemper, parvovirus, and infectious canine hepatitis starting with an initial immunization at six to eight weeks of age. This is followed by boosters every three to four weeks until 12-14 weeks old. Certain breeds have a higher frequency of individuals that do not develop vaccine-induced antibody titers during the routine pediatric series, including the Rottweiler, Doberman pinscher, Labrador retriever, Alaskan sled dog, Pomeranian, and American Staffordshire terrier. Extended vaccination schedules are often proposed for these breeds.

Vaccines containing killed coronavirus combined with killed leptospirosis bacteria targeted for use in puppies should not be used due to increased frequency of hypersensitivity reactions. Canine leptospirosis is a bacterial infection that causes kidney and liver failure in dogs of all ages. There are several different serovars, which are antigenically distinct from each other, and strains are not cross-protective. The killed bacteria suspended in adjuvant are responsible for many hypersensitivity reactions, particularly in Dachshunds and other small breeds, and only induce a short-lived immunity of six to eight months.[1]

Type 1 (immediate) hypersensitivity reactions involve antigen specific IgE or IgG on the surface of a mast cell or basophil, resulting in degranulation and release of vasoactive substances. These can be seen within minutes in most cases or be delayed up to 24 hours post-exposure. Though we generally see fairly local response, they can be quite severe and generalized. In dogs, the primary manifestations are facial pruritis and edema, hives and urticarial lesions. More severe cases can show hypotension, dyspnea, diarrhea and collapse. Cats have more respiratory signs, including dyspnea, shock, salivation, and pulmonary edema. Miniature Dachshunds are over represented in the literature. A more minor reaction, yet one of concern to owners, is a very localized reaction, in the form of a sub-cutaneous mass at the injection site, occasionally painful, which tends to be transient in nature. We have considered the possibility that this may suggest some increased sensitivity in the affected patients. The granuloma may not appear for several weeks post-vaccination, and it is thought that this is a local reaction to the adjuvants in vaccine.

In our practice, we see a disproportionate number of young canines that react, represented by Dachshunds, Pugs, and Boston terriers, with a smattering of other breeds. Interestingly, we also see a fair number of these breeds presented for atopic issues as well. Vaccination has been found to exacerbate the immune response of dogs with preexisting inhalant allergies. Vaccine antigens may potentially exceed the immunologic tolerance threshold of some animals with atopy. The more antigens administered in a vaccine, the greater the chance of inducing hypersensitivity. Often it is difficult to link this kind of tissue damage to vaccination, but this may be due to the fact that damage tends to be caused by the accumulation of many antigens from many vaccines over years of a dog's life, rather than from any one given vaccine. We most assuredly see a distinct worsening of allergies within 2-4 weeks post-vaccination in sensitized dogs.

In light of this, we have developed some therapeutic regimens for vaccination reactions in those puppies that return to us, within an hour or so post-vaccination bearing a vague resemblance to a platypus. In addition to the facial edema, they may manifest wheals and urticaria, and varying degrees of pruritis. Because this syndrome is reminiscent of bee sting hypersensitivity, we treat symptomatically for it, with a combination of Apis-Homaccord and Lymphomyosot. In many cases, we give the remedies combined, and administer half the dose in an intravenous injection, for rapid response. The remaining half, which contains a small amount of blood from the injection IV, is succussed and given sub-cutaneously. The dose varies depending on the size of the patient. Animals under 10 pounds receive 1/4 of a vial, 10-30 pounds get 1/2 a vial, and larger breeds get a full vial.

We have occasionally seen quite dramatic response to this therapy, often within an hour, and there is certainly an arrest of swelling shortly after treatment. We then send home a mixed Homotoxicology "cocktail" of Apis-Homaccord and Lymphomyosot drops, and advise the owners to give 0.25-0.5 ml per dose as needed until the swelling subsides.

Juvenile German Shepherd with facial edema, 1 hour post-exposure to vaccination.

Juvenile German Shepherd with facial edema, 24 hours after therapy.

Incidentally, this particular mixture "lives" in my kitchen, and my children have learned to run for this remedy if stung by bees or wasps, and they have had the occasion to test out its efficacy over the years. I use it topically, for wheals and pruritis brought on by skin irritants, and can personally attest to its ability to arrest the annoying itching welts that crop up randomly. The same remedy works well on dogs for similar contact irritations. It has also made the trip to Nicaragua with a missionary group, where it proved to be a useful remedy when one of the workers awoke with severe facial swelling, presumably due to an insect bite. A few doses of the Apis-Homaccord and Lymphomyosot (10-15 drops every 15 minutes), and she was markedly improved and able to participate in the remainder of the day's work.

Also to be considered is the excellent effect of Engystol, due to the combination effect of Vincetoxicum officinale (asclepias) and sulfur. Engystol has had good effects on various skin diseases such as neurodermitis, urticaria, eczema, furunculosis, as well as on diseases of the respiratory organs, especially asthma, cardiac and circulatory diseases, and therefore should be considered in feline vaccine reactions, as there is a strong respiratory component to their manifestations of hypersensitivity. Enygstol is dosed at 1/2cc in acute feline asthma cases. We frequently will give part of this intravenously. The remedy is succussed in the syringe, and then the remainder is given as a subcutaneous injection, in the manner of an auto-sanguis therapy. Acute cases, such as the "lumpy puppies" generally respond quite dramatically, and seldom require ongoing therapy, while the atopic, pruritic skin patients may need long-term support. Long-term support of atopic cases is a subject which merits an entire article, and may be covered at a time in the future.

REFERENCE:
1. Greene CE, Schultz RD, Ford RB. Canine Vaccination. In: *North American Veterinary Clinics* 2001. Ford RB, ed. 31(3): 473-492.