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Scientific Review Article

VACCINATION — A LITERATURE REVIEW AND POSSIBLE THERAPEUTICS FOR VACCINOSIS

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Introduction

There is a growing awareness of health problems that may be associated with vaccine administration, both in the short term, and in the prevalence of chronic "vaccinosis." This term was created in holistic medical circles to describe disease states that may arise from vaccination. In addition to immediate sensitivity reactions, there is increasing evidence suggesting that vaccination, particularly over-vaccination, (meaning the administration of unnecessary vaccinations), is associated with development or aggravation of immune-mediated disorders and chronic diseases in individuals that are genetically predisposed (1, 2). Serious disorders such as diabetes, which has reached epidemic proportions in the human field, have been associated with vaccines (3).

A great number of studies have shown that when vaccinations are administered, not only do the body's inflammatory cytokines increase dramatically, but so do the brain's inflammatory chemicals (4, 5). A retrospective study was done to determine incidence rates and potential risk factors for vaccine-associated adverse events diagnosed within 3 days of administration in dogs (6). The study reported that 4,678 adverse events (38.2/10,000 dogs vaccinated) were associated with administration of 3,439,576 doses of vaccine to 1,226,159 dogs. The risk factors were significantly increased for smaller, neutered dogs. The risk of an adverse event significantly increased as the number of vaccine doses administered per office visit increased and with subsequent vaccine challenges as animals age (6). This risk factor is more than double the manufacturer claims for less than 15 adverse reactions in 100,000 animals vaccinated (0.015 percent).

Vaccine data sheets state that vaccines are for use in healthy animals only; this is a licensing requirement, but sick pets are routinely vaccinated. A typical datasheet for common vaccines states: "Immunocompetence of the animal may be compromised by a variety of factors including poor health, nutritional status, genetic factors, concurrent drug therapy and stress." Thus, some animals are unable to mount an immune response to the vaccine challenge, which can explain why disease outbreaks occur in heavily vaccinated, stressed, and malnourished dogs in rescue facilities. Another consideration is the issue of immunosenescence, which can seriously retard response to vaccination in the elderly, as demonstrated in human studies (7, 8).

Adjuvants and Contaminants

A common set of risk factors may be deduced in an assessment of adjuvants and contaminants. Many species are used in vaccine manufacture, including monkeys, dogs, cats, hamsters, and avian embryos. Bovine serum, a common carrier in vaccines, caused concern during the bovine spongiform encephalitis outbreak due to potential cross-species infection; foreign serum and animal protein also threaten inflammation and autoimmunity (9).

Adjuvants such as mercury and aluminum salts are also added to vaccines to increase the immune response (9–11). In addition to the attenuated pathogen, vaccines may contain many other ingredients such as other heavy metals, antibiotics, antifungals, preservatives, and other chemicals, along with biological protein and cellular extracts, and even the possibility of other unknown disease agents (9–11). The well-known Simian Monkey Virus (SV40), which has been attributed to the induction of cancer in humans, is a stellar example. For years we have assumed that these small amounts of chemicals were insignificantly low enough to cause significant disease

phenomena, but with the advent of discoveries in the field of nanopharmacology, we now know that even small quantities of substances can interfere with bodily functions. Although many manufacturers have removed one such substance (thimerosal, a mercury salt), it is not known what other similar substances, e.g., aluminum, may be contained in the patented formulas of current products and contribute to neurological disease and allergic/atopic syndromes (9–11).

Most pharmaceutical companies will not disclose the exact contents of their products. A 2003 study at the University of Maryland School of Medicine found that exposure to low levels of mercury can speed up and worsen the symptoms of an induced lupus-like disease in mice, even when the exposure occurs before the development of the disease (11). Antibodies, or markers characteristic of lupus-like autoimmunity, were significantly elevated in the mice that had been pretreated with mercury. Mercury exposure in animals can exacerbate preexisting autoimmune disease and even induce autoimmune disease in susceptible animals (11). In 1972, Eli Lilly found thimerosal to be "toxic to tissue cells" in concentrations as low as one part per million (ppm), 100 times weaker than found in a typical vaccine. Known problems with thimerosal date back many decades: "We have obtained marked local reaction in about 50% of the dogs injected with serum containing dilutions of merthiolate (thimerosal). Merthiolate is unsatisfactory as a preservative for serum intended for use on dogs" (a). Because thimerosal is still present in some veterinary vaccines, this certainly can be an issue in vaccinosis. Mercury and aluminum are neurotoxins. Aluminum can have significant mutational effects on the P-53 oncogene and cancer, thereby ruining the individual's ability to stop tumorgenesis (12, 13).

It should be noted that clinicians are seeing a significant increase in neurological diseases associated with vaccine damage, i.e.,vaccinosis (14, 15). Components of vaccines can damage the cellular matrix, as demonstrated in the Purdue University Hayward study on vaccines (1, 4, 5, 16). There are studies that have linked neurological disease with vaccines, particularly the rabies component (14, 15). A canine study and a human report of 4 cases of neurological complications following vaccination with cerebral-type lyophilized vaccine from the Province of Poznan are 2 examples from the literature (14, 15). The latter reported cases occurring in middle-aged men that exhibited the following syndromes: Landry's ascending paralysis, polyradiculoneuritis, polyneuritis, and encephalopolyradiculoneuritis (15).

The Purdue University School of Veterinary Medicine conducted several critically important studies to determine if vaccines alter the immune system of dogs in such a manner that might lead to immune mediated diseases. (4, 5, 16). In their studies, a group of Beagle dogs were routinely vaccinated and closely followed for 3 years with specific blood tests at regular intervals. Blood from all of the vaccinated dogs contained significantly elevated concentrations of antibodies directed against proteins present in commercial vaccines as contaminants of the production process, primarily of bovine origin, due to the use of fetal calf serum as a growth medium (4, 5). The unvaccinated control dogs had no increases in these antibodies. The biochemical marker proteins that generated reactive antibodies in the vaccinates included fibronectin, laminin, DNA, albumin, cytochrome C, cardiolipin, and collagen (4, 5).

Fibronectin is a molecule involved in tissue repair, the formation and growth of embryos, blood clotting, and cell migration/adhesion. Laminin surrounds muscles, nerves, and fat, and is involved in may cellular activities including the adhesion, spreading, differentiation, polarization, proliferation, and movement of cells. Albumin, manufactured by the liver, maintains intravascular oncotic pressure which enables fluid to remain in the bloodstream rather than leak into tissues; hypoalbuminemia can lead to ascites and edema. Albumin also transports fatty which are integral to all of the membranes around and inside cells.

Antibodies against cardiolipin were also found in the Purdue study (5). Anti-cardiolipin autoantibodies are frequently found in patients with systemic lupus erythematosus, and other autoimmune diseases. Elevated levels of these antibodies also have been associated with thrombosis, thrombocytopenia, and recurrent fetal loss, as well as neurological conditions.

Autoantibodies to cytochrome C can cause deficiency of cytochrome C oxidase, leading to progressive degeneration of the brain and dysfunction of other organs of the body including the heart, kidneys, muscles, and liver. In other cases, this deficiency may be systemic, and lead to a generalized weakness of skeletal muscles, abnormalities of the heart and kidneys, and/or abnormally high levels of lactic acid in the blood. Symptoms may include loss of previously acquired motor skills, loss of appetite, vomiting, irritability, and/or seizures.

The Purdue study also found that vaccinated dogs were developing autoantibodies to collagen which comprises about one quarter of all the protein in the body (5). Collagen is a major structural protein, forming molecular cables that strengthen the tendons, and resilient sheets that support the skin and internal organs. Bones and teeth are formed

by mineralizing collagen. Dr Larry Glickman who, with his colleagues, conducted the Purdue study, stated:

> "Our ongoing studies of dogs shows that following routine vaccination, there is a significant rise in the level of antibodies dogs produce against their own tissues. Some of these antibodies have been shown to target the thyroid gland, connective tissue such as that found in the valves of the heart, red blood cells, DNA, etc. I do believe that the heart condition in Cavalier King Charles Spaniels could be the end result of repeated immunizations by vaccines containing tissue culture contaminants that cause a progressive immune response directed at connective tissue in the heart valves. The clinical manifestations would be more pronounced in dogs that have a genetic predisposition [although] the findings should be generally applicable to all dogs regardless of their breed" (4).

Of great concern, as the previous statement noted, is that the Purdue studies found that the vaccinated dogs had developed autoantibodies to their own DNA (4, 5).

A more recent research project from the Purdue group studied the incidence of post-vaccination thyroid disease in 20 healthy research Beagles and 16 healthy pet dogs. The research Beagles were split into several groups, with variations in the type of vaccines administered: multivalent only, rabies only, multivalent plus rabies, and unvaccinated controls. Assays for antibodies directed against bovine and canine thyroglobulin were performed prior to and 2 weeks after each yearly vaccination. In the pet dogs, blood was collected prior to and 2 weeks after 1 vaccination. The results showed a significant increase in anti-bovine thyroglobulin antibodies in all vaccinated dogs compared with control dogs. There was a significant increase in anti-canine thyroglobulin antibodies in the 2 groups of dogs that received the rabies vaccine but not in the group that received the multivalent vaccine alone (16).

The Merck Manual cautions that patients with, or from families with, B and/or T cell immunodeficiencies should not receive live-virus vaccines due to the risk of severe or fatal infection (17). Elsewhere, it lists features of B and T cell immunodeficiencies as food allergies, inhalant allergies, eczema, dermatitis, neurological deterioration, and heart disease. A deranged immune response may lead to inflammatory conditions such as arthritis, pancreatitis, colitis, Addison's disease, bone marrow failure, encephalitis, and any number of immune diseases like cancer, lymphoma, leukemia, and autoimmunity, in which the body attacks its own cells causing diseases of the pancreas (diabetes), thyroid (Hashimoto's type disease), collagen and fibronectin dysfunction (scleroderma, systemic lupus), and cardiolipin (cardiomyopathy) (17).

Chronic kidney disease in cats is recognized to have an inflammatory component (1, 2). Chronic low-grade inflammation causes gradual destruction and scarring of the kidney, eventually resulting in loss of function and failure of the organ. Research from Colorado State University suggested a link between vaccination for feline panleukopenia virus and the development of chronic renal failure from immune-mediated interstitial nephritis (18). The panleukopenia virus was grown in a feline kidney cell culture to make the vaccine.

Additionally, it is widely acknowledged that vaccines can cause or "trigger" the fast-acting, often fatal autoimmune or immune-mediated hemolytic anemia (1, 5, 17, 19, 20). Without treatment, and frequently with treatment, patients can die within a matter of days. Vaccine-associated thrombocytopenia can also occur alone or along with the autoimmune hemolytic anemia (1, 19). Certain breeds or families have been shown to be at increased risk for immune-mediated hematological disorders (1, 5, 17).

Anesthesia and surgery have also been reported to significantly alter the immune response (21, 22). Vaccination at the time of surgery can be a complication, as it can significantly depress immune function; and studies show an altered blood brain barrier induced by anesthetics (21–23).

A post-vaccinal encephalomyelitis in dogs can be associated with immunizations against canine distemper virus, rabies, and canine coronavirus-parvovirus vaccines (24–28). There have been cases reported in the literature of post-vaccinal enchepalitides following immunizations with canine distemper virus, and these give some cause for concern, particularly in dogs undergoing surgery, in shelter situations, and with other stressors (1, 24–28). All of these events can create a "perfect storm" and overwhelm the immune system (1).

Immunodeficiencies are also a cause for concern in relation to vaccinations. The Merck Manual states: "Children with known or suspected immunodeficiency disease should not receive any live virus vaccines, since they could initiate a severe or fatal infection… Patients with either B or T cell immunodeficiencies should not be given live vaccines because of the risk of vaccine-induced illness" (17). Immunosuppressed patients are more susceptible to infections. One study showed chicks had a decreased resistance to E. coli infection post-vaccination (29). A report noted a fatal outbreak of salmonellosis in a breeding cattery post-vaccination, and concluded that modified -live

virus vaccines may cause transient immunosuppression and should be used with caution because of the possibility of activating sub-clinical opportunist infections (30).

Another study described how the rubella vaccine in humans can cause immunosuppression for at least one month after vaccination, possibly due to defective lymphocyte responses post-vaccination (31). Yet another study concluded that, when canine distemper virus was combined with canine adenovirus type 1 or canine adenovirus type 2, significant suppression in lymphocyte responsiveness to mitogen occurred (1, 2).

Cancer, as noted earlier, is another potential sequel to immunosuppression (32–34). One paper illustrated how a dog developed mammary cancer when immunosuppressed, as lymphocytes attack infected and cancerous cells, and vaccines are shown to disable them (35). Another undisputed phenomenon is that cats can develop vaccine-site sarcomas (12, 32, 36). Dr. Dennis Macy stated, "I estimate there are about 22,000 cases of [feline] vaccine- associated tumors per year… it is likely that the more vaccines given in a particular site, and the more vaccines given over time, the higher the chance of sarcoma development" (37). Aluminum and other adjuvants have been implicated (9, 37, 38).

Vaccine-site sarcomas also occur in dogs (33). Two of the vaccine-deregulated molecules, the tissue-controlling laminin and fibronectin, are the same ones that reverse, kill, or promote tumors. Alteration in the balance, such as when a vaccine disturbs a tissue and fibronectin is produced in abundance while laminin is suppressed, can induce tumor growth and metastasis (39). Cancer researchers explain how the inflammatory process can be intimately involved in cancer production and also how it is an essential process in malignancy (34).

There are also documented correlations between vaccine events and the onset of arthritis (31, 40). The rubella virus has been isolated from the affected joints in children vaccinated against rubella (40). Isolation of viruses from the peripheral blood of women with prolonged arthritis following vaccination was also found, although lower rates of arthritic reactions are seen in children and men (31, 40).

Polyarthritis and other diseases like amyloidosis have been linked to combination vaccines given to dogs (1, 5, 19, 27). There is a large body of research, despite the paucity of funding from the vaccine industry, to confirm that vaccines can cause a wide range of brain and central nervous system damage (1, 5, 14, 15, 24–26, 38). The Merck Manual states that vaccines can cause encephalitis from brain inflammation and damage (17). In some cases, encephalitis involves lesions in the brain and throughout the central nervous system. The Manual also states that "examples are the encephalitides following measles, chickenpox, rubella, and smallpox vaccination, vaccinia, and many other less well defined viral infections." (17).

Immediate Reactions

Several years ago, the author realized that the incidence of hypersensitivity reactions had been increasing in the veterinary practice (41). This was particularly evident in the juvenile puppies as a result of the vaccination procedures (1, 2). 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 parvovirus, the author and others have continually been "downsizing" vaccine protocols to the bare minimum, as we have observed an increase in vaccination reactions (41). Despite reducing the number of inoculations and limiting the antigens given in the vaccines, we still see occasional reactions. Older dogs receive minimal to no "puppy vaccines" because in the US and elsewhere, the incidence of clinical disease from distemper, infectious hepatitis, and parvovirus in vaccinated, immunized dogs older than one year of age is virtually zero. Studies on durations of immunity with puppy vaccines, indicate long protection from early life vaccination (42).

High levels of maternal antibodies acquired from ingestion of colostrum protect puppies from disease for the first 6 to 8 weeks of life, after which 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 (1, 2, 27, 42, 43). This is the most common cause of vaccine failure in puppies. Therefore, immunizations are repeated at timed intervals to insure development of a protective immune response (42, 43). Certain breeds have a higher frequency of individuals that do not develop sufficient vaccine-induced antibody titers during the routine pediatric series, including breeds such as the Akita, Alaskan sled dog, American Eskimo Dog, American Staffordshire Terrier, Doberman Pinscher, Labrador Retriever, Pomeranian, Rottweiler, and Weimaraner (1, 42, 43). Extended vaccination schedules may be needed for these breeds (42).

Polyvalent vaccines containing killed, inactivated coronavirus and/or leptospirosis bacterin should not be used except in high exposure risk situations, due to their increased frequency of hypersensitivity reactions (42, 43). Leptospirosis is a zoonotic bacterial infection that can occasionally cause kidney and liver failure. There are 7 different pathogenic serovars which are antigenically distinct from each other, and they are generally not cross-protective. The canine killed bacterin products suspended in adjuvants are responsible for hypersensitivity reactions, particularly in Dachshunds and other small breeds, and certain Lepto vaccines only induce a short-lived immunity of 6 to 8 months (43).

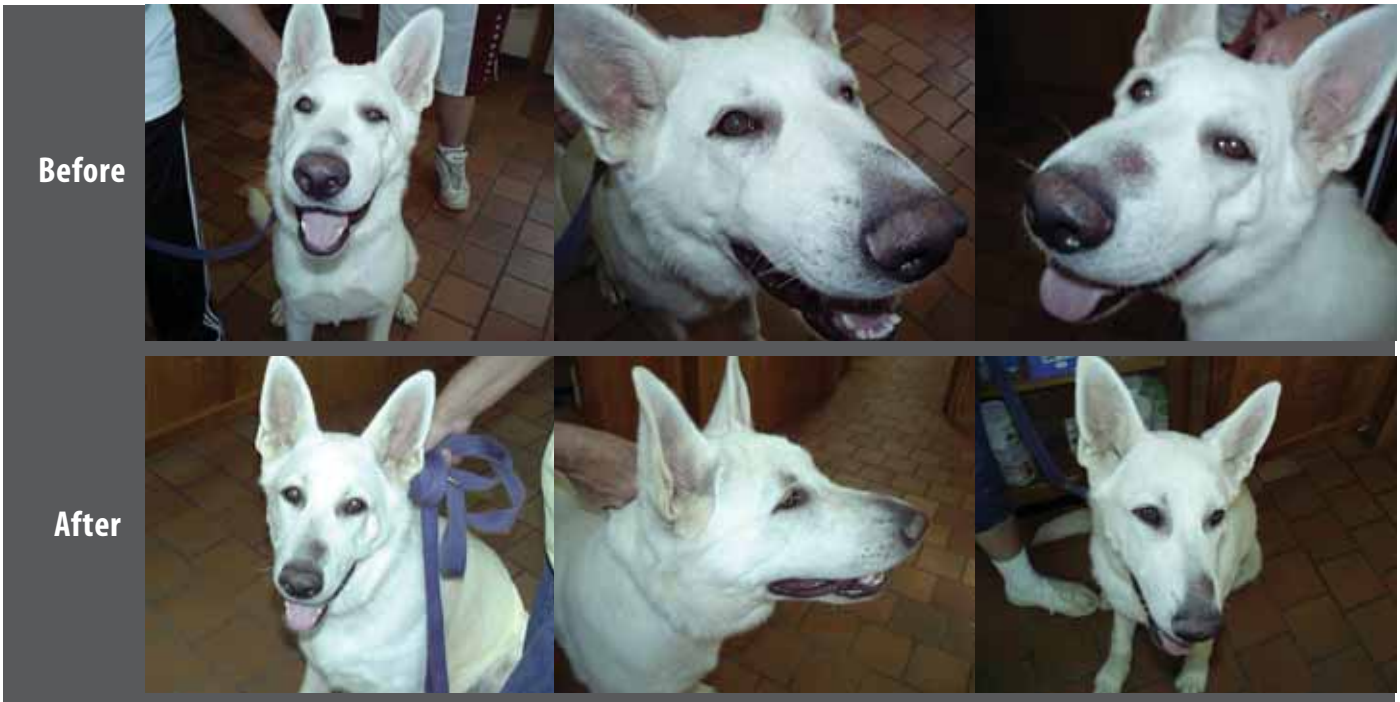

Figure 1. Vaccine reaction – Facial Edema

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 (19). These can be seen within minutes in most cases or can be delayed up to 24 hours post-exposure (43). Though we generally see a fairly local response, the reactions can be quite severe and generalized. In dogs, the primary manifestations are facial pruritus and edema, hives and urticarial lesions (19, 43). More severe cases can show hypotension, dyspnea, diarrhea, and collapse. Cats exhibiting vaccinosis usually have more respiratory signs, including dyspnea, shock, salivation, and pulmonary edema (19). Miniature Dachshunds are over represented in the literature. A minor reaction, yet one of concern to owners, is the presence of a localized reaction in the form of a subcutaneous granulomatous mass at the injection site. This is occasionally painful but tends to be transient in nature. The granuloma may not appear for several weeks post-vaccination and is thought to be a local reaction to the adjuvants in vaccines (43).

Chronic Vaccinosis Issues

In our practice, we see a disproportionate number of young canines that react to vaccinations, as represented by Dachshunds, Pugs, and Boston Terriers, with a smattering of other breeds (41). Interestingly, we also see a fair number of these breeds presented for atopic inhalant issues as well. Vaccination has been found to exacerbate the immune response of dogs with pre-existing inhalant allergies. This may be a result of the IgE response to the aluminum or other components in vaccines (10, 28).

Vaccine antigens may potentially exceed the immunologic tolerance threshold of some animals with atopy (10). The more antigens administered in a vaccine, the greater the chance of inducing hypersensitivity (1, 6). 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 the many vaccines given 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 previously sensitized dogs (2, 41, 43).

The 1983 study cited above showed that allergies (such as atopic dermatitis) develop in dogs when vaccinated with distemper, hepatitis, and leptospirosis vaccines just before, but not after, exposure to pollen extracts (28). Dogs predisposed to atopy produce excess amounts of IgE antibodies in response to antigens, resulting in chronically irritating skin inflammations. Other organs may exhibit signs of hypersensitivity, causing, for example, conjunctivitis or rhinitis, as exhibited in further studies by this group (28).

Therapeutics

Immediate Hypersensitivity Reactions

Immediate hypersensitivity vaccination reactions in those puppies that return to us within an hour or so post – vaccination often present with angioneurotic edema of the face (**see Figure 1**). In addition they may manifest with wheals and urticaria, and varying degrees of pruritus. Because this syndrome is reminiscent of a bee sting hypersensitivity reaction, we treat symptomatically for it, with a combination

of Apis Homaccord and Lymphomyosot. The dose varies from 1/4 – 1 vial each, depending on the size of the patient. Puppies under 10 pounds receive 1/4 vial, 10–30 pounds get 1/2 vial, and larger dogs get a full vial. In many cases, we give the remedies combined and administer half the dose in an intravenous injection to achieve a rapid response. The remaining half, which contains a small amount of blood from the intravenous injection, is succussed and given subcutaneously. We have occasionally seen quite a 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 and Lymphomyosot drops, given at the rate of 1/4 – 1/2 cc per dose, and advise the owners to give it as needed until the swelling subsides.

Also to be considered is the excellent effect of Engystol, due to its combination of Vincetoxicum officinale and Sulphur. Engystol has had good responses with various skin diseases such as neurodermitis, urticaria, eczema, and furunculosis, as well as with diseases of the respiratory organs, especially asthma, cardiac and circulatory diseases. It should be considered, therefore, in feline vaccine reactions, as there is a strong respiratory component to their manifestations of hypersensitivity (44). Enygstol is dosed at 1/2 cc 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 autosanguis therapy. Acute cases, such as with those that present with wheals, edema, and urticarial, (the "lumpy puppies"), generally respond quite dramatically, and seldom require ongoing therapy, while the atopic, pruritic skin patients may need long-term support (41, 44).

Chronic Vaccinosis Therapies

Beyond the immediate reactions, the therapeutics become much more complex and deserving of an entire article devoted to each disease pathology. However, a brief summary of some therapies are worth consideration.

A general therapeutic regime can be suggested for immune balancing and modulation (45). We have had many years of success with thymus extracts, and based on studies that date back to 1906 on the biological effects particularly in terms of immune function, and recent suggestions of repair of neurological damage including Parkinson's syndrome and dementia, we started with an injection of thymus extract (b) (45–47).

Thymus gland hormones can reduce autoimmune reactions, clinically and experimentally, such as occur in rheumatoid arthritis (47–49). They prevent the bone marrow injury and subsequent reduction in white and red blood cell production which often occur secondary to chemotherapy or radiation, and theoretically might be of use in hemolytic anemia to support the bone marrow (44, 45). Thymus gland hormones can balance disease-fighting antibodies by reducing the levels of the IgE in patients suffering allergic rhinitis, asthma, and atopic dermatitis (46, 47). Thus, these hormones tend to reduce immunity when excessive, as evidenced by overly high T- lymphocyte CD4:CD8 ratios often seen in rheumatoid arthritis (49, 50). They can be considered a "homeostatic enabler." A retrospective study of 130 patients suffering various ailments received oral pharmaceutical thymus extract. Prior to treatment, 40 subjects had T-lymphocyte CD4:CD8 ratios below normal, 78 had normal ratios, while 12 cases had above normal ratios. After 3-months, the oral therapy had increased the T-lymphocyte CD4:CD8 ratios of the below-normal group while the ratios of the above-normal ratio group decreased. Those patients with already normal T-lymphocyte CD4:CD8 ratios increased their ratios slightly. These studies have generally shown that thymus gland extracts are very safe, non-toxic, and free of side-effects, with few contraindications for use (50).

A study related thymus atrophy and changes in thymocyte subpopulations of rats due to low dose mercury, and found induced renal autoimmune disease (48). Since the thymus is important in the selection of developing thymocytes, the immunotoxic effects of mercury on its structure and thymocyte subpopulations may have serious consequences. Autoimmunity (and in particular autoantibodies to laminin) may be responsible for the changes observed in the thymus (48). This suggests some strong indicators for the use of thymic extracts as therapeutics in vaccine-induced disease.

We routinely combine thymus extracts with homotoxicology formulas, such as Tonsilla compositum, Engystol, Echinacea forte, Belladonna compositum, Coenzyme compositum, Ubichinon, Glyoxal, and Lymphomyosot as an autosanguis (44). They work remarkably well given as an autosanguis, in acupuncture points, or administered subcutaneously or intramuscularly. These medications are useful for attendant arthritides (49).

In addition to autosanguis injections, we often send home a complex cocktail of the aforementioned medications into which we succuss the remaining thymus/blood in the syringe. These therapies are often augmented with Vetri-DMG (c) as a base for the homotoxicological oral formula, based on studies that show a wide range of effects that dimethylglycine has on immunological function and neurological issues (51).

As essential nutritional support, we often utilize PentaGenesis (d) (every 24 hr in the morning) (52). This is a combination of deer velvet, green lipped mussel, thymus, colostrum, and porphyra which reportedly has multiple effects including balancing the immune system, gut and liver repair, and tissue

regeneration (53–55). A more in depth discussion of a possible vaccine-induced distemper-like syndrome, and an approach to managing the neurological manifestations has been presented by this author (56).

Velvet Antler contains some hormonal components that can act as immunomodulators (47, 54, 57). It is known that estrogens regulate thymus function and suppress cell-mediated immune reactions. Antibody response and natural immunity (natural killer cell cytotoxicity, phagocytosis) are augmented by estradiol. Many of the immunological effects of testosterone are due to its conversion to estradiol by aromatase in the thymus and in other lymphoid organs ((54). Velvet antler may prevent stress-stimulated hypertrophy of the adrenals and involution of the thymus, and thus help to normalize thymic function. Tests also show that in laboratory animals, velvet antler may prevent stress-stimulated hypertrophy of the adrenal glands and involution of the thymus (57). Studies demonstrated that aqueous extracts of velvet antler were highly potent in causing an increase in human white blood cell count, particularly monocytes (55). Monocytes represent 3 to 7 percent of leukocytes in blood and are necessary for the immune function of lymph, spleen, bone marrow, and loose connective tissue. Antler tip section preparations have also been observed to stimulate wound healing (55). Erythropoiesis with increased red blood cell production has been observed in anemic rats and rabbits given velvet antler products; this finding supports the empirical use of velvet antler for conditions of anemia in humans (48, 57). Velvet extracts also slow tumor growth and have demonstrated antitumor activity against Bacillus P-92, a tumor cell line, in mice (55, 57). Fermented velvet antler increases the survival rate of mice that have tumors from 25–40 percent (55, 57).

Conclusion

Where do we go from here?

DVM magazine published a round table debate in which eminent vaccine experts discussed the pros and cons of vaccine use (27). Dr. Ronald Schultz stated: "We have had the idea for years that vaccines, if they don't do any good, won't cause harm. I think that's another concept the veterinarian has to get away from because whether it be modified live or non-infectious, there is the potential to cause harm" (27). At that time, all 27 veterinary schools in North America adjusted their protocols for vaccinating dogs and cats based on current knowledge and physiological data that indicates that the immune systems of dogs and cats are fully mature at 6 months. If a modified live-virus vaccine is given after 6 months of age, it should produce lifelong immunity. If another modified live-virus vaccine is given, the antigens of the second vaccine are mostly neutralized. The serum antibody titer is boosted only transiently and additional immune memory cells are not induced. Thus, annual boosters are not only unnecessary, but they subject the pet to potential risks as discussed above (60, 61). Clearly, veterinary schools in America plus the American Veterinary Medical Association have looked at studies to show how long vaccines last, and they have concluded and announced that annual vaccination is unnecessary (35, 58, 59). It would be prudent for all veterinary practitioners to take notice and act accordingly.

Endnotes

a. Director of Biological Services, Pittman-Moore Company, letter to Dr. Jamieson of Eli Lilly Company dated 1935. U.S. Congressional Record, May 21, 2003, E1018, page 9.

b. Thymus Extract — Kyosenex™, ULR Laboratories LLC, 5333 Likini Street, Suite 1510, Honolulu, HI 96818

c. Vetri-DMG — VetriScience Laboratories. 20 New England Drive, Essex Junction, Vermont, 05452.

d. Pentagenesis — a combination of deer velvet, green-lipped mussel, thymus, colostrum and porphyra; New Zealand Deer Velvet Products, Christchurch, New Zealand.

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