VACCINATIONS AND VACCINOSIS

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I would like to emphasize that it should be up to the primary health care provider to follow the vaccination protocol that she/he considers viable and valuable under their expertise.

The primary goal of this paper is to bring to the health care provider's attention some of the concerns which have been brought up not only by the Holistic but also by the Conventional practitioners during the last decade (see reference list for specifics).

We will briefly discuss the immune system and its function, vaccine controversies and new protocols for conventional vaccines and other holistic alternatives.

The Immune System, an Overview

The immune system can be divided into the nonspecific (innate or natural immunity) and the specific (acquired immunity) kind[1].

There are four types of barriers for the innate immunity, these include the anatomic, phagocytic, inflammatory, and the cytotoxicity of the natural killer cells (NK). NK cells are a third population of lymphocytes that are distinctive from T and B cells.

The anatomic barrier is classified as the primary line of defense and as you can theorize, is one of the most important means to avoid any colonization or invasion by "foreign proteins". The skin contains various soluble chemical factors (lysozymes, interferon and complement which are secreted by the sebaceous glands), and it has desiccated/desquamating layers of cells, which when mixed with the natural pH of the skin, will make an unfriendly environment for replication of both bacteria and viruses.

Phagocytic barriers include the "cellular family" of Polymorphonuclear Cells (PMN), of which the neutrophil is the major component. The *neutrophils* are formed in the bone marrow, migrate to the bloodstream, and later move to the affected area of need. The neutrophils will find and migrate to the affected area by means of chemotaxis, adhere (by means of the C3 protein and antibodies), ingest (by phagocytosis), and digest (with NADP, myeloperoxidase, lysosomes and defensins) the "foreign" substance.[2]

The eosinophilic component of the PMNs, is one of the major indicators of either allergic, cancerous, or parasitic disorders that might be affecting our patients. Like neutrophils, eosinophils have their primary function as phagocytic cells. Their "digestion" methods are more efficient than those of neutrophils.

Eosinophils do contain both antibody and complement receptors, being the antibody receptors less efficient (less affinity) when compared to neutrophils.

Basophils, which are the least numerous cells of the PMN family, have the primary function of provoking inflammation. Their granules contain vasoactive amines such as histamine and serotonin.

Platelets, on the other hand, not only contribute to the clotting mechanism but also help to "tag" and engulf bacteria. However, if the antigen (protein, bacteria or virus) is completely surrounded by platelets, this can act to protect the antigen from immune recognition and destruction.

The lymphocytes are divided into two kinds, the T-cell derived and the B-cell derived. Lymphocytes are highly specific and mount an immune response only to antigens for which they are *genetically* programmed to respond.[3] The lymphocytes that mature in the thymus gland are called T lymphocytes. They accumulate within the lymph nodes, spleen and the Peyer's patches. T-lymphocytes mediate specific cellular immunity, which develops specific resistance to infection to many viruses, fungi, and mycobacteria; and also mediate acquire specific delayed hypersensitivity, which influences a wide variety of infections and recognize cells in tumors or allografts.[4] T-cells are relatively long-lived and survive from 6 months to as long as 10 years.[5] When activated, the T-cells proliferate and differentiate into memory T-cells and various effector T-cells, which are not only responsible for cell-mediated immunity (CMI), but also for the regulation of humoral immune responses.[6] There are two major types of T lymphocytes; the T helper cells (T-H) and the T cytotoxic cells (T-C).

The B lymphocytes originate in the bone marrow and accumulate within the lymph nodes, spleen and Peyer's patches. Once they are stimulated, they transform into plasma cells which are responsible for the synthesis of specific antibodies (i.e, humoral immunity). One of the most important aspects of the symbiotic relationship between the T and B lymphocytes is that the function of *both* humoral and CMI depends upon the activation of T-H cells.[7] Lymphocytes can be stimulated (naturally) to increase mitosis by compounds called LECTINS (which are plant derived). Phytohemagglutinin (from the red kidney

bean), concanavalin A (from the jack bean), and pokeweed mitogen (from the pokeweed plant) are examples of lectins.

There are FOUR major and TWO minor isotypes of Immunoglobulins (Ig). Igs G, M, A and E are the major ones with Igs D and N being the minor ones. IgG is the major immunoglobulin in mammalian serum, which consists of antibodies produced against viruses, bacteria, and toxins (from infections or immunizations). IgM, although second in mammalian serum concentration, is the major immunoglobulin isotype produced in *primary immune response*. It is considered more efficient than IgG at complement activation, opsonization, neutralization, and agglutination of viruses. Because of its very large size, IgM stays within the bloodstream and is therefore of little importance in conferring protection in tissue fluids or body secretions.[8] IgA, is referred as "the secretory globulin", and as such is found in the mucosal surfaces (gastrointestinal system, respiratory and urogenital tracts, and at the ocular and mammary gland mucosae). As practitioners, due to the linebreeding and inbreeding that is occurring in many dog breeds, we will be encountering IgA deficiencies more often as affected dogs continue to be bred. IgE mediates Type I hypersensitivity and is largely responsible for immunity to inhalant allergens and parasites, and the mediation of inflammatory agents acting on masT-cells or basophils. IgD and IgN are trace immunoglobulins. Dogs possess IgA, IgM, IgE and four subclasses of IgG. Cats possess IgM, IgA and two subclasses of IgG.[9]

To summarize, the main purpose of the immune system is to go "out there, search, and destroy foreign materials."

Vaccines: A Definition

"Vaccination involves either giving antigen derived from an infectious agent to an animal so that a protective immune response is stimulated or giving sufficient preformed antibody to an animal so that protection is achieved".[10] There has been an erroneous assumption which equates vaccination with immunization. Just because a patient has been vaccinated, it does not mean that she/he has been immunized or protected against that disease. Think about it, if you buy a lottery ticket, does that mean that you automatically will hit the jack pot?

The main purpose of any conventional vaccine (antisera and immune globulins excluded) is to expose the body to "sublethal" concentrations of *antigens* (proteins from viruses, bacteria or parasites) which will stimulate the immune system to produce *antibodies* to fight the disease.

There are two basic methods by which an animal may be made immune to infectious diseases. Passive immunity, which is coffered by transferring antibodies from a protected to an unprotected animal. Immune globulins from colostrum (mainly IgG) or milk (mainly IgA) and toxoids are some examples of passive immunity. Even though

immune globulins give "immediate" protection, there are side effects that might occur, which will be discussed later on . Active immunization or vaccination, involves, as discussed previously, the administration of antigens to an animal so that it responds by mounting a protective immune response. Reimmunization or exposure to infection *should* result in a secondary immune or anamnestic response. A disadvantage of active immunization is that protection takes a couple of weeks to develop, although once achieved, it is long lasting and capable of restimulation.[11]

There are two methods by which "active immunization" can be achieved: inactivated vaccines and modified live vaccines. The term *"inactivated vaccines"* can be used interchangeably with "killed vaccines". An inactivated vaccine is made by using chemicals or other means that will render the virus or bacterium "organically dead" in such a way that the proteins needed to stimulate the immune system remain immunogenic. Examples of such chemicals are formaldehyde, acetone, alcohol, ethylene oxide, ethylenimine, acetylethilenimine and beta-propiolactone. In addition, adjuvants (substances that enhance reactions) are also mixed with the vaccines, so that stimulation of the immune system will be enhanced, thereby increasing antibody response. Aluminum salts such as aluminum hydroxide, aluminum phosphate and aluminum potassium sulfate are examples of commonly used adjuvants but there are many different types of proprietary nature.

"Attenuated or modified live" vaccines are those that are rendered non-infective by heating the organisms until they become weakened (just below the thermal death point), by exposing the organism to sublethal concentrations of chemicals or by prolonged passage in tissue culture. The end result of any of these methods is a "weak and very friable organism" (either bacterium or virus) that will activate the immune system. Again, these vaccines are mixed with other protectants or enhancer to preserve and minimize the potential for reversion to virulence.

Conventional Vaccines: What About them?

As professionals, we will be exposed in one way or another to canine vaccines (distemper, parainfluenza, hepatitis, leptospirosis, parvovirus, coronavirus, kennel cough, Lyme and rabies), feline vaccines (panleukopenia, calicivirus, rhinotracheitis, leukemia, FIVS, FIP and rabies) and equine vaccines (potomic horse fever, flu, Eastern/Western/Venezuelan influenza, rhino, Lyme, strangles and rabies).

Vaccines have been used for decades to try to prevent or minimize the devastating consequences of infectious diseases and to control the spread of a specific disease. When used in conjunction with public health and sanitation measures, vaccines have been successful in preventing the spread of devastating and contagious diseases. However, many health professionals attribute the primary impact on reducing the prevalence of common infectious diseases to the implementation of improved public health and sanitation practices. For example, polio was in decline by the time the vaccines "came out to save the world".[12] This disease only started to increase in incidence again, *after* the introduction of the modified live vaccine (MLV). In fact, over 87% of the confirmed cases of polio in the United States are attributed to the consequences of reactivation of the disease (from days to years) after the use of the polio MLV.[13,14] Measles death rate declined to 5% by the time the vaccine was introduced in the 1960s.[15] According to a study conducted by the World Health Organization (WHO), chances are about 14 times greater that measles will be contracted by those vaccinated against the disease than by those who are not vaccinated.[16] Some recent outbreaks continue to occur among 100% vaccinated populations, not to mention that there have been new atypical symptoms emerging among vaccinated individuals, years after the vaccination.[17,33] There does not appear to have been refereed retrospective studies similar to those done in humans dealing with vaccines used in the veterinary field, other than "one sentence opinions".[18]

Vaccines were once thought to be harmless when given repeatedly. Of course, we now know that THIS IS NOT TRUE!

Risks Associated with the Use of Vaccines:

As medical professionals, we know that all treatments (be they conventional or alternative) come with some type of side effect. "Since the beneficial effects of vaccines are a result of changes in the immune system, it would not be surprising if some of the adverse effects were also a result of those changes".[18] Some of the most well-known side effects of vaccines are as follows:

1. Residual Virulence: Can cause clinical symptoms compatible with the disease that the patient is being vaccinated against
2. Immunosuppressive properties: This side effect has been well-known to veterinarians since inception of the use of vaccines in animals
3. Hypersensitivity reactions:
   a Type I: Anaphylaxis is mediated by a specific class of antibody called cytotropic antibodies (which belong to the IgE class), because they have an affinity for binding to membranes of certain circulating or tissue fixed cells.[20]
   b. Type II: It is characterized by the binding of antigen and antibody, which in turn activates the complement cascade. Damage to host tissues results from the attraction of phagocytic cells, phagocytosis of the immune complexes, and release of proteolytic enzymes into the surrounding tissue by the phagocytic cells, which results in TISSUE INJURY. (i.e. pemphigus, arthritis, fibromyalgia, kidney / liver damage).[21]
   c. Type III: The Arthus reaction is mediated by

combining the antigen and antibody in the presence of *excess* antigen, with the deposition of antigen-antibody complexes in internal organs. Lupus erythematosus and rheumatoid arthritis are examples of this reaction.

d. Type IV: It is also known as the delayed or cell-mediated hypersensitivity. Damage results from the interactions of sensitized T-cells with a specific antigen, hence releasing lymphokynes (which have a direct influence on inflammatory cells) which primarily affect macrophages.

4. Vaccine contamination with other viruses (herpes, blue tongue, leukemia) or bacteria (mycoplasma).[34,35]
5. The possibility of an *episome* (foreign genetic material) from the MLV portion of the vaccine which attaches to the *genome* (DNA or RNA of a "host cell") of the vaccine recipients' cell.[22] This persistence of viruses and foreign proteins within the cells of the immune system is believed to account for the current increase of "CHRONIC DISEASES" in both human and animal populations.
6. Latent viruses (viruses that survive inside the host cells for years, without causing disease) have already been implicated in three distinct types of chronic disease: RECURRENT OR EPISODIC; SLOW VIRUS {such as subacute sclerosing panencephalitis and Guillain-Barre syndrome} and TUMORS!!!![23]
7. Causing an anamnestic response to other immunogens, such as occurs in atopy or other allergies.[24]
8. Development of autoimmune disease. Autoimmunity reflects a loss of immunologic tolerance to self tissue and cellular antigens, and it is characterized by an abnormal or excessive activity of the immune effector cells.[25] *The persistence of live viruses or other foreign antigens within the cells of the host therefore cannot fail to provoke self-reactivity (auto-immunity), since that is the only way that the body will be able to rid itself of the affecting organism.* Over vaccinations have been associated with autoimmune diseases.[26]
9. The preventative efficacy of some vaccines is *controversial*. (e.g. feline leukemia, infectious peritonitis, coronavirus and Lyme disease are among some of them.[27]
10. System overload due to the nature of the polyvalent vaccines.[28]
11. Interference with ELISA diagnostic test results!!! "We may see false positive results on toxoplasmosis, FIP or FIV tests after routine herpesvirus, calici, and panleukopenia vaccination".[27]
12. Development of localized sarcomas or other cancerous changes.[36,37,38,39,40,41,42]
13. The misconception that revaccinations will cause an increase in protective titers in patients that already have protective titers from previous immunizations.[28,32]
14. Worsening of current disease states, such as allergies, cancer, seizures, etc.[3,10,14,23,25]

Alternative to Conventional Vaccines

The use of "nosodes"*** is an alternative pathway to "conventional" vaccines. A nosode, is a remedy made from the products of a disease (i.e., secretion, discharge, or lesion). It is not made directly from a culture of the disease agent or from a vaccine.[29] The preparation of nosodes or any homeopathic remedy is done in accordance with the Homeopathic Pharmacopoea of the United States (H.P.U.S.), which is under the supervision of the Food and Drug Administration, and has been since 1938. The remedy is given to an animal to stimulate the innate immune system of each *individual*. The only "substance" that might be mixed with any of the nosodes or homeopathic remedies for that matter, is alcohol, which serves as a preservative.

There are many theories on how nosodes work. Stimulation of the immune system (memory cells) and of the vital force (the energy which maintains life and harmony in any given individual or animal) are proposed theories.

There have been multiple clinical studies done on the use of nosodes with good clinical results.[30] Only one limited controlled study using nosodes has been performed. The result of this study were less than favorable. However, the author stated that since there is no set protocol on the use of nosodes, additional controlled experimental studies using nosodes (by using different protocols) for parvo and other diseases should be done to determine if any of the nosodes currently used for prevention provide protection from disease.[43]

There are several ways that nosodes can be used. Hopefully, the veterinary homeopathic community will bring its expertise together to standardize nosode protocols.

What the holistic community is trying to prevent is what is called *vaccinosis*. *Vaccinosis* is the reaction of the body against the vaccines that are being injected year after year. It does not refer to acute reactions to the vaccines, but to chronic reactions that the body will develop toward not only the MLV but also to the chemicals, adjuvants, and other adventitial components of tissue culture cell lines, as well as possible genetic changes that can be induced on the genome of the host.

**** Another alternative to conventional vaccines is checking for *titers* of specific diseases. Titer is the name for a serological test that measures a specific concentration of a given immunoglobulin. The only way that we can quantitate any kind of measurement on how the immune system responded to the vaccines, is by checking the concentration of serum neutralizing (SN), heamagglutination inhibition (HAI) and/or indirect fluorescent (IFA) antibody titers. However, it is important to understand that just because the patient has developed titers, it doesn't mean that it will be protected 100% (the same holds true for vaccines; just because the animals have been vaccinated, it doesn't mean tht they will be protected at all). It is up to the immune system to react to the invading organism and hence maintain the system in the best shape as possible. There have been studies done, in which pets that have no measurable humoral antibody titers, have been exposed experimentally to viruses, and they have not developed the disease. In these cases, cell-mediated and secretory immune functions have presumably conveyed protection. Remember, memory cells are the ones that will carry the "floor plan" on "how to" build up the antibodies needed to fight the infection.

I have seen recommendations for the "re-testing" of vaccine titers ranging from 1-4 years. Personally, in our practice we recommend every 2 years and we *emphasize* that the immune system must be kept in top shape!!!

New Protocols with Conventional Vaccines

As we all know, the main challenge to be overcome with conventional vaccines is IF and HOW they can overcome the neutralizing effect of maternal antibodies so that the young animal can mount an "immune response" to the antigens being injected. The "maternal protection" in puppies can last from 6 weeks to 18 weeks depending on your source of information. The main method that companies are using to increase efficacy is by increasing the antigenic component of the vaccines or adding more potent adjuvants to inactivated vaccines.

According to the most recent literature, the "newer generation of vaccines" are supposed to break through this "protection barrier" and "immunize" puppies as early as 6 weeks. These "new vaccines" can be found under the following trade names: Progard-7 (Intervet Inc.), Parvo XL (Rhone Meireux), Fort Dodge and Smith Kline and Pfizer. They (the manufacturers) are recommending the use of three (3) doses given 3 weeks apart and then annual revaccination thereafter.

I would like to emphasize that the scientific community has not only isolated the adjuvants as a cause for oncogenic processes, but the concentration of the vaccine antigen as well.[37] So, in other words, we might be overcoming the maternal immunity and hopefully "immunizing" the animal, but we may also be predisposing these animals to oncogenic problems.

What About Annual Vaccines?

Annual vaccinations is a practice that was started many years ago but lacks any scientific validity or verification!!![31] Immunity to viruses can last for years, if not for the life of an animal. If a dog has developed protective titers against a disease, subsequent responses to revaccinations would be rendered ineffective by those titers. If you think about it, it would be like vaccinating a puppy with titers that have been transferred from the mother. As a result, booster doses of vaccines, DO NOT "boost" the immunity of dogs that already have protective immunity.[32]

The revaccination myth can be traced, if you may, to the "gross production" aspect of any veterinary practice. It is sad to say, but vaccinations have been and are still being misused by our medical peers.

For those who wish to use yearly vaccines

Many of you will continue to use vaccines annually. Professionally, I will back you up 100%; but I will urge you to follow some simple recommendations:

1. Only HEALTHY animals should be vaccinated (i.e. no ear, skin, teeth, or internal/systemic organ problems, NOR SEIZURES.[3,14,44]
2. If you have hypothyroid patients, auto-immune thyroiditis MUST be ruled out
3. Remember fecal shedding which occurs after any MLV vaccine is given
4. Don't follow vaccination "FADS", use common sense!
5. Avoid vaccinations of females that are going through hormonal changes (pregnancy or "heat")
6. Never vaccinate before or during pregnancy!! Remember, the mother's body will be primed to tolerate the fetuses (which are foreign substances), and so vaccines can increase the overall immunoreactivity reaction to these "substances" hence causing either abortion, stillbirth or congenital defects.
7. Respect and treat the patients as you would like your own pet to be treated
8. Ask yourself: Are we creating chronic problems? More susceptibility to allergies and predisposing to immune problems and cancers!

The Supreme Being Gave Us the Ability to Choose. Let's Choose Wisely, We Are Here Only for a Little While!!!

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