SHORT COMMUNICATION

The Journal of Animal & Plant Sciences **19(3): 2009, Pages: 165-167**
ISSN: 1018-7081

THE ALTERNATIVES TO VACCINATION

A. Rashid and K. Rasheed*

Veterinary Research Institute, Ghazi Road Lahore Cantt Pakistan
*University of Veterinary and Animal Sciences, Lahore, Pakistan

ABSTRACT

Vaccination is no doubt the single most useful measure available to prevent infectious diseases. Preventing disease protects the health and welfare of the animals, helps to prevent the spread of disease to humans and helps to protect the environment. Sometimes, shortly after vaccination, a wide range of adverse consequences i.e., residual virulence and toxicity, allergic effects, disease in immunodeficient host, neurological complications etc have been observed, due to which, owners of animals that have shown signs are unwilling to re-vaccinate their animals. So they are using the alternative ways. The present article describes some of the alternatives to vaccination which include isolation of animals, control of disease vectors and reservoir hosts, serological testing for assessing serum antibody titres and treatment of infected animals.

Keyword: Vaccination; Adverse consequences; Vector; Reservoir; Antibody

INTRODUCTION

Vaccination is an effective way of controlling infectious diseases and has achieved spectacular success in promoting human and animal welfare. In conjunction with the introduction of antibiotics and modern hygiene, vaccines have significantly contributed to a steady decline in the mortality and morbidity that is caused by infectious diseases (Rashid *et al.,* 2009).

As a matter of principle, veterinary vaccines must be safe not only for the target animal species but also for the vaccine users, consumers of foodstuffs of animal origin and the environment. The risks associated with the use of vaccines are primarily related to the properties of the vaccine, care in handling and administration, and recipient host factors (Grein *et al*., 2007).

A wide range of adverse consequences of vaccination has now been observed in various animal species (James, 1999; Myer, 2001). Some of these such as transient post-vaccinal non specific illness (pyrexia, lethargy and anorexia for some days post vaccination), regional lymphadenopathy or immuno-suppression are likely to directly related to the activation of immune and inflammatory pathways by the process of parental vaccination (Day, 2006). In past, a report clearly documents the elevation in humoral but depression in cellular and innate immunity in dogs 2 weeks post-vaccination (Strasser *et al.,* 2003). Vaccine induced immunosuppression may cause the development of severe disease in animals that are carrying sub clinical opportunist pathogens (Foley *et al.,* 1999). There is mounting evidence that the multisystemic infection or inflammatory disorder of young Weimaraner dogs with poorly characterized immune deficiency may be triggered by vaccination (Dodds, 1999; Harrus *et al.,* 2002; Foale *et al.,* 2003).

Local injection site reactions are rarely reported in animals although it is clear that tissue inflammation does occur at sites of vaccination, particularly with adjuvanted products. The most visible of local reactions are the range of aggressive feline sarcomas for which the working hypothesis suggests that adjuvant-induced chronic inflammation might trigger the genetic changes that underlie neoplasia (Richards *et al.,* 2005).

Owners of animals that have shown signs that may be due to an adverse reaction to a vaccine are unwilling to re-vaccinate their animals but many owners are still willing to provide some form of protection. In addition, there are a small numbers of owners who, for ethical or economical reasons do not wish to vaccinate their animals so they used the alternative ways (Ramsey and Bryn, 2001). The present article describes the some alternatives measures to vaccination which are as follows;

Isolation: The term 'isolation' refers to the separation and segregation of animals to protect and prevent the transfer of infectious diseases. This usually means that an animal, which is infected or is suspected of being infected, is housed in such a way as to prevent other animals coming into contact with the disease causing organism.

Methods used for isolation depend upon the mode of transmission of the disease and species of animal involved (Lane and Cooper, 2003). Four factors are essential for the transmission of infectious diseases from one animal to other i.e. a microorganism capable of causing diseases and capable of transmission, an environment favorable to the growth of a particular microorganism, a susceptible host and a mechanism by

which the microorganism can be transferred. First three factors can never be wholly removed. It is, therefore, important to concentrate on the fourth factor i.e., the essential link of the transfer mechanism by which a microorganism is transferred from one animal to another. The prevention of this mechanism can be achieved by 'barrier nursing' or 'isolation nursing' of the infected animal. As long as such isolation is performed in an effective and humane manner, then it is the optimum method of control of infectious diseases. The most widely used example of this is the 'test and remove' scheme that has kept a large number of catteries free of FeLV for some years (Ramsey and Bryn, 2001).

Control of disease vectors and reservoir hosts: In epidemiology, a vector is an organism that does not cause disease itself but that transmits infection by conveying pathogens from one host to another, serving as a route of transmission while reservoirs serve as continuing source of disease agents. Both perpetuate disease in a population in which it would otherwise disappear. Few of the diseases that are currently vaccinated against are spread by vectors. *Leptospira icterohaemorragica* is maintained in a reservoir host (rats and other rodents) and effective control of these can reduce the contamination of water source from which the infection is contracted by companion animals (Ramsey and Bryn, 2001). Infectious diseases transmitted by biological vectors can be controlled by removing the vectors. Insecticides can destroy biting fleas and other insect vectors that transmit pathogenic organisms. The habitat of the vectors can be destroyed by draining land to remove snails that are the intermediate hosts of *Fasciola hepatica*. Similarly, Modern recombinants DNA technology offers the prospect of controlling trypanosomiasis in humans and animals by eliminating the ability of the tsetse vector to transmit the pathogen by introducing foreign genes with a pathogenic activity (Beaty, 2000; Aksoy *et al.*, 2001) while living organisms that mechanically transmit infectious agents can be controlled by destruction and disinfection.

In one study, applying strict tick control with the aim of controlling tick-borne diseases. It can only succeed under the following specific condition (De Waal and Combrink, 2006);

In epidemic areas, where the disease normally does not occur and the vector ticks could be considered to be only temporary invaders. In endemic areas, where the disease normally occurs and vector ticks are permanently established. In such areas, control is more difficult to accomplish and more costly. The disease may be controlled by eradicating ticks or keeping their numbers so low that large outbreaks do not occur. For this strategy to succeed, excellent management and an extremely intensive dipping programme are essential, since only a few infected ticks are required to cause a disease outbreak.

Serology: Prospective serology involves testing for managing and attempting to eliminate diseases before they produce catastrophic outbreaks. Measuring antibody is the preferred laboratory method of assessing immunity, as the techniques are simple in comparison to measure cell mediated immunity and can be performed on an easily collected stable sample (Burr and Snodgrass, 2004). Tests such as virus neutralization and hemagglutination inhibition are generally regarded as being the optimum techniques in terms of sensitivity and specificity but ELISA-based systems are likely to give comparable results much of time (Paul, 2006).

For those livestock and pet owners, who are concerned about possible adverse reactions or who do not wish their animals to be 'over-vaccinated', a pragmatic solution to their problem is to measure serum antibody titres. This will establish whether the animal is likely to be immuned and therefore does not require to be vaccinated. Assessment of serum antibody to several disease pathogens allows the state of protective immunity (Ramsey and Bryn, 2001).

Treatment: The National Committee for Clinical Laboratory Standards (NCCLS) has defined terms to describe herd or flock antibiotics use (Anonymous, 2002). Therapy is the administration of an antimicrobial to an animal, or group of animals, which exhibit frank clinical disease. Control is the administration of an antimicrobial to animals, usually as a herd or flock, in which morbidity and / or mortality have exceeded baseline norms. Prevention / prophylaxis is the administration of an antimicrobial to exposed healthy animals considered to be at risk, but before expected onset of disease and for which no aetiological agent has yet been cultured.

Antibiotics, anthelmentics, other drugs and hyper immune serum are used therapeutically to treat diseases and prophylactically administered at times of high risk to prevent diseases and thus to increase productivity.

Some infectious diseases may be controlled by treatment of outbreaks rather than vaccination. This may be a cost-effective alternative for the control of bacterial, rickettial, parasitic and fungal diseases. Sometimes, chemotherapy can be used to eradicate diseases e.g., warble fly was eradicated from the UK through the use of 'warblecide' (MAFF, 1987).

In conclusion, isolation of unaffected animals from diseased one, control of disease vectors and reservoir hosts, serological testing for assessing the serum antibody level and treatment of sick animals can prevent the adverse consequences of vaccination.

REFERENCES

Aksoy, S., L. Scott O' Neill, I. Maudlin, C. Dale, and A. S. Robinson (2001). Prospects for control of African trypanosomiasis by tsetse vector manipulation. Trends in Parasitol. 17(1): 29-35.

Anonymous (2002). Performance standards for antimicrobial disk and dilution susceptibility tests for bacteria isolated from animals-Second Edition: Approved standard M31-A2. NCCLS, Villanova, PA, USA.

Beaty, B. (2000). Genetic manipulation of vectors; a potential novel proceeding of National Academy of Sciences of the United Sates of America. 97: 10295-10297.

Burr, P and D. Snodgrass (2004). Demystifying diagnostic testing: serology. In practice. 26: 498-502.

Day, M. J. (2006). Vaccine side effects: fact and fiction. Vet. Microbiol. 117: 51-58.

De Waal, D. T and M. P. Combrink (2006). Live vaccines against bovine babesiosis. Vet Parasitol. 138: 88-96.

Dodds, W. J. (1999). More bumps on the vaccine road. Adv. Vet. Med. 41: 715-735.

Foale, R. D., M. E. Herrtage, and M. J. Day (2003). Retrospective study of 25 young Weimaraners with low serum immunoglobulin concentrations and inflammatory disease. Vet. Rec. 153: 553-558.

Foley, J. E., U. Orgad, D. C. Hirsh, A. Poland, and N. C. Pedersen (1999). Outbreak of fatal Salmonellosis in cats following use of a high-titer modified-live panleukopenia virus vaccine. J. Am. Anim. Hosp. Assoc. 214: 67-70.

Grein, K., O. Papadopulos, and M. Tollis (2007). Safe use of vaccines and vaccine compliance with food safety requirements. Rev. Sci. Off. Int. Epiz. 26 (2): 339-350.

Harrus, S., T. Waner, I. Aizenberg, N. Safra, A. Mosenco, M. Radoshitsky, and H. Bark (2002). Development of hypertrophic osteodystrophy and antibody response in a litter of vaccinated Weimaraner puppies. J. Small Anim. Pract. 43: 27-31.

James, A. R. (1999). Mechanistic bases for adverse vaccine reactions and vaccine failures. Adv. Vet. Med. 41: 681-700.

Lane, D. R and B.C. Cooper (2003). Veterinary nursing. 2nd Ed. Butterworth Heinemann. 140p.

MAFF (1987). Warble fly. Ministry of Agriculture, Fisheries and Food, Alnwick. McEntee, M. C and R. L. Page (2001). Feline vaccine-associated sarcomas. J. Vet. Intern. Med. 15: 176-182.

Myer, E. K. (2001). Vaccine – associated adverse effects. Vet. Clin. N. Am. Small Anim. Pract. 31: 493-514.

Paul, B. (2006). Serological testing – An alternative to boosters? Vet. Microbiol. 117: 39-42.

Ramsey, I. K. and J. T. Bryn (2001). Manual of canine and feline infectious diseases. British Small Animal Veterinary Association, UK. 50p.

Rashid, A., K. Rasheed, and M. Akhtar (2009). Factors influencing vaccine efficacy-A general review. J. Anim. Pl. Sci. 19(1): 22-25.

Richards, J. R., R. M. Starr, H. E. Childers, T. H. Elston, M. J. Hendrick, B. E. Kitchell, D. W. Macy, K. D. McClure, W. B. Morrison, L. P. Vogel, and L. V. Welborn (2005). Vaccine-associated feline sarcoma task force: Roundtable Discussion. The current understanding and management of vaccine-associated sarcomas in cats. J. Am. Hosp. Assoc. 226(11): 1821-1842.

Strasser, A., B. May, A. Teltscher, E. Wistrela, and H. Niedermuller. (2003). Immune modulation following immunization with polyvalent vaccines in dogs. Vet. Immunol. Immunopathol . 94: 113-121.