

Popular Article

Parasitic Vaccines

Akanksha Choudhary and Rashmi Singh

Department of Veterinary Medicine, Post Graduate Institute of Veterinary Education and Research, JAIPUR, RAJUVAS, Bikaner

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Introduction

Protective immunity can be induced by either active or passive immunization. Passive immunization provides immediate immunity by administering preformed antibodies to an individual. Passive immunity is short lived since transferred antibodies are metabolized. Active immunization involves administration of antigen in the form of vaccine. By this way immunity provoked takes several weeks to develop but may persist for a longer time.

Following types of antiparasitic vaccines are used-

- 1) **Live vaccine-** Live vaccines are based on live organisms that stimulate an immune reaction in the hosts, mimicking natural infections.
- A) **Lung worm vaccine-** Dictyocaulus Viviparus infection in calves can be successfully prevented by using X irradiated third stage larvae which irradiated at 40 Kr. This vaccine contains two dose of 1000 irradiated larvae given at an interval of one month. First dose given when calves are of 8 weeks of age. It is suggested that calves should be confined indoors at least for 2 weeks after 2nd vaccination. Vaccination is claimed to be 89% effective in preventing clinical lung worm disease in average condition.
- B) **Hookworm vaccination-** Larvae of Ancylostoma caninum irradiated at 40 Kr and 1000 larvae administered S/C, protected pups against the severe challenges. Vaccination may be started 72 hours after birth and maternal antibody and prenatal colostrum infection do not interfere with efficacy of the vaccine. Duration of immunity at least 7 months. An unexpected bonus of the vaccine was that it induced protection against A. Braziliense and Uncinaria stenocephala. Since this vaccine dose not induce sterile immunity allowing the single worm to become mature and produce egg, together with high cost of production led to withdrawal of vaccine in 1975.

- A) Poultry coccidiosis-** Coccivac and Immunocox are two commercial vaccines against poultry coccidiosis. This vaccine consists of viable oocyst from 8 different fully virulent *Eimeria* spp. combined with a weak coccidiosis. Vaccine can be administered with drinking water at the age of 4-10 days. The primary exposure starts the process of immunization but the substantial immunity depends upon re-infection of birds with excreted oocysts.
- B) Rakshavac T-** This is a commercial vaccine against *Theileria annulata*. This vaccine based on the principle that schizont stages of the organism can be cultivated in lymphocyte culture. If the serial passaging is done, over a long period of time, the virulence of the parasite is attenuated. The vaccination is done with such attenuated cultured schizonts, distributed in frozen form. Age of vaccination is 2 months or above and repeat yearly in endemic areas.

2) Dead vaccines -

I. Killed vaccines/ cultured supernatant

- A) Neoguard-** This vaccine comprising of a killed *Neospora tachyzoite* preparation formulated with an adjuvant [SPUR(R)]. This vaccine has about 50% protectivity against abortions occurring at 5-6 months of gestation in cattle due to *N. caninum*.
- B) Cultured supernatant like Piridog-** This is a commercial vaccine against *B. canis*. This vaccine contains exoantigen obtained from microaerophiles stationary phase culture (MASP culture) supernatant. The first dose of vaccine is given from 5 months of age and second dose is given 3-4 weeks later.

II. Recombinant/ sub-unit Vaccine-

- A) Taenia ovis-** This is a recombinant vaccine against *T. ovis* cysticercosis in sheep contains a cloned oncosphere antigen (TO 45w). The vaccine stimulates a response that prevents penetration of parasite into intestinal wall. This vaccine provides immunity for 12 months in 98% cases.
- B) Tickguard-** This is a commercial vaccine against *Boophilus microplus*. This vaccine containing mid gut antigen of *B. microplus* named Bm 86. The protective immunity interfering with engorgement phase of tick *B. microplus*. The immune components produced against these antigens get delivered to the tick gut during blood sucking process, cause damage to tick gut and lead to its elimination.

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