Efficacy of a single dose of rHVT-H5 Avian Influenza vector vaccine against a clade 2.3.2.1 of H5N1 Highly Pathogenic virus

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Abstract

Today, Avian Influenza caused by H5N1 Highly Pathogenic virus is an endemic disease in several countries of Asia and Africa. In most of these countries, vaccination using inactivated vaccines is regarded by producers as well as veterinary authorities as an important tool to protect poultry and control the spread of the disease. However, the efficacy of this approach has shown limitations mainly because of the following factors: (i) in case of too early administration, neutralization of inactivated vaccines by maternally derived antibodies transmitted to their progeny by vaccinated breeders, (ii) poor reliability of individual vaccine injections when completed at farm, (iii) breaches in biosecurity by vaccination crews going from farm to farm, (iv) antigenic evolutions of the field virus that require continuous updating of vaccines and make it difficult to timely select the right vaccine.

Studies conducted with a novel rHVT-H5 vector vaccine (Vectormune AI – Ceva) have demonstrated the potential of this new category of vaccine that can breakthrough passive immunity, and consequently be injected in a much more reliable manner to day-old chicks at the hatchery, and offer a broad spectrum of protection against antigenic variations of the field viruses.

The aim of this study was to test the efficacy of this rHVT-AI vector vaccine against challenge with a new antigenic variant of H5N1 HPAIV, classified as clade 2.3.2.1, which has recently emerged as a dominant genotype in several Asian countries.

Day-old SPF chicks were vaccinated with rHVT-H5 vaccine, or kept as controls, and challenged at 28 days of age with 10^6 EID50 of a recent 2.3.2.1 H5N1 HPAIV field isolate from Bangladesh. Response to vaccination as well as protection was evaluated on the basis of clinical observation, antibody responses using HI, anti-nucleoprotein and anti-neuraminidase ELISAs, and reduction of shedding.

Clinical protection reached 100% and shedding was detected in only 20% of the vaccinated and challenged chickens. Antibody responses were consistent with clinical data and indicated strong resistance to infection. Data obtained from this challenge experiment indicate that the tested rHVT-H5 vaccine can be a valid tool to combat AI in endemic situations.

References


Keywords: Avian Influenza; vector rHVT-AI vaccine; genotype 2.3.2.1 H5N1