

The Influence of Different Challenge Doses of Highly Pathogenic Avian Influenza Virus on the Efficacy of Different Avian Influenza Vaccines

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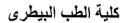
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ABSTRACT

This study aims to investigate the influence of different challenge doses of HPAIV on the efficacy of two different types of inactivated AI vaccines H₅N₁ and H₅N₂. Groups of specific pathogen free chicken (SPF) were vaccinated with the recommended dose by the manufacturer, and another group was kept as control. Four weeks post vaccination (WPV) both vaccinated and control chicken groups were bled for the detection of Ab titer in response to vaccination using HI test. The results revealed that the Ab titer produced with H5N1 vaccine was 8 log2 and 7 log2 for H5N2 vaccine. The vaccinated chicken with the two vaccines were subdivided into 4 subgroups to be challenged by the doses (10⁴, 10⁵, 10⁶, and 107) EID₅₀ of HPAI challenge virus. It was calculated by recording deaths for each vaccine. The protection percent of the chicken vaccinated with H5N1 vaccine was 100% in case of all AIV challenge doses while it was 90% for the chicken groups vaccinated with H5N2 in cases of $(10^4, 10^5, 10^6)$ EID₅₀ challenge doses and 85% in case of 10^7 EID₅₀ challenge dose. Oropharyngeal swabs were taken to estimate viral shedding for each challenge dose by viral reisolation using SPF ECE and qrRT-PCR. Results of viral reisolation in SPF ECE shows reduction in shedding. The $(\hat{10}^4, 10^5, 10^6 \text{ and } 10^7) \text{EID}_{50}$ challenge doses of HPAIv reduced the viral shedding by $(10^{4.5}, 10^{5.2}, 10^{6.1})$ EID₅₀ and $10^{7.2}$ EID₅₀ for H5N1 vaccine, While the reduction was lesser in case of H5N2 vaccine for the challenge doses by $(10^{4.5}, 10^{5.2}, 10^{4.1})$ and $(10^{3.7}EID_{50})$ respectively. The rRT-PCR results were $(4.1 \times 10^4, 1.1 \times 10^5, 4.0 \times 10^5)$ and 1.2×10^6) reduction in shedding by doses $(10^4, 10^5, 10^6)$ 10⁶ and 10⁷) EID₅₀ of HPAI challenge virus. These results demonstrate that chicken vaccinated with good quality inactivated AI vaccines under good condition were protected from clinical signs and deaths caused by AIv infection and the shedding of the virus was minimized even with high challenge dose.

Keywords: Avian Influenza virus, H5N1, H5N2, Shedding, Challenge

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INTRODUCTION

