

Vaccination of broilers against Highly Pathogenic Avian Influenza H5N1 does not reduce mortality or virus transmission

O.N. Poetri^{1,2}, A. Bouma², I. Claassen³, G. Koch³, R.D. Soejoedono¹, J.A. Stegeman², Michiel van Boven⁴

¹ Faculty of Veterinary Medicine, Department of Infectious Diseases and Public Health, Bogor Agricultural University, Bogor, Java, Indonesia

² Faculty of Veterinary Medicine, Department of Farm Animal Health, Utrecht, the Netherlands

³ Central Veterinary Institute (Wageningen University and Research Centre), Lelystad, the Netherlands

⁴ Center for Infectious Disease Control, National Institute for Public Health and Environment, Bilthoven, The Netherlands

Abstract

A highly pathogenic Avian Influenza (HPAI) virus strain H5N1 is currently circulating in various countries in South East Asia. In endemically infected countries vaccination is one of the tools to support control of HPAI. Vaccination is mainly applied to layer and parent stock, but not to broilers because of their short life span. Although it is not yet clear whether broilers play a role in the epidemiology, the question is whether broilers can be vaccinated in such a way that transmission of AI virus strain is reduced. The aim of our study was to quantify H5N1 virus transmission in unvaccinated broilers and to determine the efficacy of vaccination in groups of broilers. One experiment and one replication were carried out with 4 groups with 22 birds each. Group 1 consisted of unvaccinated broilers; groups 2 and 3 consisted of broilers vaccinated intramuscularly with an inactivated H5N1 strain A/chicken/Legok/2003 at day 1 or day 10 of age, respectively. Group 4 consisted of day-old chicks (DOC) at time of challenge when the birds in groups 1-3 were 28 days old. Birds were housed in pairs. At challenge, one bird per pair ($n=4 \times 11$) were challenged intranasally with H5N1 virus A/chicken/Legok/2003. The other bird in each pair (C) was contact-exposed to the inoculated pen mate (I). Trachea and cloaca samples were taken during 10 days after challenge (pc) and tested in the virus isolation test; serum samples were collected at challenge and at the end of the experiment, 4 weeks pc, and tested for the presence of antibodies in a haemagglutinin inhibition test. The reproduction ratio was quantified. All inoculated birds shed virus, and nearly all contact birds became infected. Only in the DOC group transmission was reduced, although not significantly. This finding implies that vaccination of commercial birds at the age of hatch or 10 was not effective in reducing transmission of H5N1. Moreover, broilers were able to transmit the virus to contact exposed birds.