THE EFFICACY OF H5N2 VACCINATION OF INDONESIAN NATIVE CHICKEN AGAINST AVIAN INFLUENZA ON THE COURSE OF INFECTION WITH A HIGHLY PATHOGENIC H5N1 STRAIN

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Introduction

Avian Influenza caused by the highly pathogenic (HPAI) virus strain H5N1 virus strain is **a** major problem in Indonesia, and is endemically present in the poultry population. Vaccination against AI is widely applied in all **sectors** of the poultry industry, but outbreaks of H5N1 virus are still reported. Commercial farmers have various vaccination and monitoring program for their livestock, but backyard native chicken farming hass less monitoring for vaccination and health. Native **chicken** are raised by most of the rural population of Indonesia using traditional production technique. They are a side-line activity and **are** not considered the main source of family earning (Diwyanto and **Iskandar 2007).** Generally, backyard native chickens **are** considered of being reservoir of **H5N1 virus** in Indonesia, as most outbreaks in **these** birds **are** reported and they are not adequately vaccinated, as indicated by low antibody titers and low coverage. Vaccination **has proven** to protect chicken agains clinical **signs of** AI after subsequent infection (Asmara 2007). **The** question was whether vaccination of these native chickens would **be** effective if applied under experimental conditions.

Materials and Methods

We carried out a transmission experiment to **study** the effect of vaccination with H5N2 **vaccine** on the transmission characteristic of a HPAI H5N1 in groups native chickens. The **experiment** consisted of two groups, one was **vaccinated** twice **at** the **age** of **4** and 7 **weeks,** the **other** group remained unvaccinated. Half of **each group was** inoculated with a field strain of H5N1. Challenge of one bird per pair at 10 **weeks** of **age:** intra-tracheally 10^5 EID50/chick. **After 24** hours the birds were placed back in their original rooms. The five sentinel were kept between the two groups. Monitoring for infection by daily clinical inspections, of trachea and cloacal swabbing daily during 10 days after challenge and serological **test** at days of **age** : 1, 14, **28, 35, 42, 49,** 56, and 63. The infection chain was monitored by virus isolation from tracheal and cloacal specimens, and serology. The vaccinated birds developed high HI antibody titers. Quantification of transmission measured by mathematical model (susceptible- infectious removed SIR). Estimation of reproduction ratio: number of secondary infections caused by one infectious bird .

- R>1: epidemic **can** be **expected**

R<1: infection in population will fade out

If in vaccinated population R<1, vaccine is efficacious eradication should **be** possible.

Results and Discussion

The experiment showed that, all vaccinated native chickens developed high titers of H5N1 and H5N2 antibodies. The mean HI titer of H5N2 antibodies was five lag steps higher than H5N1 antibodies. None of the inoculated birds shed virus in trachea or cloaca . There was no indication of infection of the inoculated birds at all, we did not calculate the R value . In addition, we found that transmission and viral shedding occurred in unvaccinated birds, which also transmitted the virus to the contact birds. No virus transmission and viral shedding occurred in the vaccinated group In field trial we might **be see** different result, titers in experimental condition were higher than in the field. There are some explanation for this condition which is : Inappropriate vaccination programme on the field (the vaccination only done one time without booster)

Lack of vaccination monitoring on the field (Bogor Institute of Agriculture 2006)

The occurrence and extent of antigenic drift in AI viruses (Capua 2007) so strarn of AI field virus may differ from AI vaccine strain.

Conclusion

In conclusion, native chicken had a good immune response by vaccination. AI vaccination could be, in principle, a success in native chicken. Native chicken can become infected, and spread virus. Native chicken can act as reservoir as long as the contact structure between native chicken is intense enough. These findings suggest that H5N2 vaccine, in principle, is able to prevent horizontal transmission of virus in native chickens.

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