

ANTIBODIES TO H5 SUBTYPE OF AVIAN INFLUENZA VIRUS IN *Macaca fascicularis* IN INDONESIA

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Introduction

Avian influenza (AI) is a highly contagious viral disease affecting several species of food producing birds (chickens, turkeys, quails, guinea fowl, etc.), as well as pet birds and wild birds (OIE, 2008a). According to WHO, AI refers to a large group of different influenza viruses that primarily affect birds. On rare occasions, these bird viruses can infect other species, including pigs and humans. The vast majority of avian influenza viruses do not infect humans. An influenza pandemic happens when a new subtype emerges that has not previously circulated in humans. For this reason, avian H5N1 is a strain with pandemic potential, since it might ultimately adapt into a strain that is contagious among humans (WHO, 2005).

Despite of the information on their susceptibility to the highly pathogenic AI virus by experimental infections (Kuiken, 2001; Rimmelzwaan, 2001), very little is known about its natural infection in long tail macaques (*Macaca fascicularis*). A report by O'Brien and Tauraso (1973) described the high incidence of antibodies to H2 and H3 subtypes of type A influenza virus in African non-human primate species.

The objective of the study was to trace and confirm the indication of AI virus natural infection in long tail macaques by antibody detection against the H5 antigen of the AIV.

Materials and Methods

This study utilized 132 serum samples from long tail macaques that are in the archive collection of Microbiology and Immunology Laboratory at IPB Primate Research Center (IPB PRC). Serum samples were grouped based on the type of breeding colony from which they were taken from. Three types of breeding colony were categorized as type A breeding colony for one managed as semi-free breeding colony on an island, type B breeding colony is outdoor captive breeding colony managed on area with the presence of poultry farms within the radius of two kilometers, while type C breeding colony is outdoor captive breeding colony managed on area with the absence of poultry farm within five kilometer range and direct contact with wild bird. The

detection of antibodies against H5 antigen of the virus was based on the beta method of Hemagglutination Inhibition (HI) Test described by OIE with minor modifications (OIE, 2008b) using inactivated reference H5N1 of AI virus purchased from BBlitvet (Balai Besar Penelitian Veteriner, Bogor-Indonesia) as standard virus.

Results

The results showed strong indication of natural infection by H5 subtype of AI virus in long tail macaques, as shown that out of 132 serum samples, 124 (94%) were tested positive by HI, while only eight (6%) were tested negative. When analyzed based on their breeding type of origin, positive HI tested serum samples were found at 97.7% in type A breeding colony, 100% in type B breeding colony, and 89.4% in type C breeding colony. The summary of the results is presented in Table 1.

Breeding source type	HI tested positive	HI tested negative	% positive
A	44	1	97.7
B	21	0	100
C	59	7	89.4
Total	124	8	94

Discussion

The high percentage of positive HI test results indicates that natural infection by H5 subtype of AI virus might have occurred naturally in long tail macaques. The samples tested in the study were made available from the archive collection of Microbiology and Immunology Laboratory at IPB PRC during the period of November 2007 to May 2008. Interestingly, when grouped into three different groups based on the type of breeding colony from which they were taken from, samples obtained from an outdoor captive breeding colony situated in an area close by to poultry farms (within the radius of two kilometers) showed 100% tested positive by HI test, while samples from an open free ranging island breeding showed 97.7% tested positive by HI test, and samples from an outdoor captive breeding colony at minimum five kilometers

away from poultry farms **showed** the lowest speculations about source of transmission are easily to **be made** based on these data, but the source of transmission is still unclear and remains **undetermined**. Further investigation is needed to reveal better information on the source of transmission. In comparison with samples taken from an **indoor** breeding colony, **we** have included 13 **serum** samples from the juveniles (ranging from one to one and a half years of age) born in the colony and the results interestingly showed that nine out of 13 samples (69.23%) were tested negative by HI test. We have not followed **up** on the mothers of the juveniles from which the samples were HI positive to see if a maternal antibodies might have been the case in the juveniles.

Conclusions

Based on the results we obtained, a conclusion that natural infection by H5 subtype of AI virus in long tail macaques (*M. fascicularis*) is very likely to have occurred. To reveal a better information on the source of transmission that might be responsible for the infection occurred in long tail macaques, further investigation will be necessary.

percentage at 89.4% HI positive. Although

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