Infectious Diseases // Human Health and Zoonoses // Emissions // Disinfection // Waste Management // Horse Session

Proceedings of the

XIV ISAH Congress 2009

International Society for Animal Hygiene

19th to 23rd July
Vechta, Germany

Volume II

INTERNATIONAL SOCIETY FOR ANIMAL HYGIENE
ISAH

XIV ISAH Congress 2009

Proceedings of the 14th International Congress of the
International Society for Animal Hygiene

"Sustainable Animal Husbandry: Prevention is Better than Cure"

Innovations in Hygiene, Nutrition and Housing
for Healthy Food from Healthy Animals

University of Veterinary Medicine Hannover, Foundation

Publisher: Tribun EU, Gorkeho 41, Brno 602 00, Czech Republic
Editors: Andreas Briese, Marcus Clauß, Jörg Hartung, Annette Springorum
Cover: Marcus Clauß
First Edition, Brno 2009
Volume II

ISBN 978-80-7399-801-1
(Volume I: ISBN 978-80-7399-800-4)

Table of Contents

Part VII

Infectious Diseases

Serological Evidence of Avian Influenza Viruses in Pigs in South-Western Nigeria

Olatoye, O I; Olugasa, B O; Omoloja, A A; Ojeyinka, O T

Department of Veterinary Public Health, University of Ibadan, Nigeria

Summary

In order to assess the involvement of pigs in the waves of Highly Pathogenic Avian Influenza (H5N1) outbreaks (HPAI) in recent years in Nigeria, one hundred and fifty (150) sera samples were collected from 10 pig herds in Ibadan and Lagos within graded distances from HPAI virus infected poultry farms. By purposive sampling method, twenty five (25) cloacal and pharyngeal swabs were collected from two herds reared along with poultry at less than 1km apart. All the sera samples were tested for presence of Avian Influenza A virus (AIV) species, using polyclonal antibodies by competitive immunochromatographic assay while the H5N1 specific antigen was used for further typing and confirmatory diagnosis of HPAI from the pharyngeal and cloacal swabs. Prevalence of 48.5% (n=73) of AIV polyclonal antibodies was obtained, while 0% prevalence of H5N1 antigen was recorded in pigs examined. Highest prevalence (57.1%) of AIV antibodies was recorded in pigs reared less than 5km to poultry farms and the lowest prevalence (1.4%) was recorded in pigs more than 15km to poultry flocks. The zero prevalence of H5N1 antigen was an indication of lack of active infection with HPAI among the pigs. The high prevalence of AIV antibodies, however confirmed exposure of the pigs to different strains of low pathogenic avian influenza virus strains. These findings could be attributed to the common practice of mixed poultry and piggery management in south-western Nigeria. Thus, there is need to include screening of pigs in AIV surveillance exercise for effective control, monitoring and public health protection.

Introduction

Between January 2006 and January 2007, about one hundred and sixty-six outbreaks of HPAI were confirmed and well over 828,000 poultry including commercial layers, breeder stocks of chicken, turkeys, ostriches, broilers, ducks, geese, local chicken and guinea fowls, had died of the disease or were culled in Nigeria [4]. The H5N1 subtype which is known to be occasionally pathogenic to human was identified in each of the outbreaks. All of these outbreaks received adequate regulatory attentions such as depopulation, biosecurity and appropriate compensation paid. However, instances of pre-depopulation sales and disposal of birds occurred on some farms, indicating that the virus have been able to escape to other premises before the confirmation or diagnosis, depopulation and biosecurity measures could be applied. The first and yet only human H5N1 case was however confirmed in January 2007 in Lagos State, south-western Nigeria 12 months after the first outbreak of the virus in the poultry population in the country [4]. Recent study [1] has confirmed the presence of trans-species spread of Influenza A viruses from pig to man and form from man to pig in Ibadan, Nigeria. Thus, classical swine viruses and avian-human reassortant viruses have been isolated from pigs across the world [2, 3 and 7]. In view of the critical role of pigs and the mixed husbandry including co-ownership practice of poultry and piggery production system in south-west Nigeria, this study investigated the presence of antibodies and antigens of avian influenza viruses including HPAI strains in pigs at graded distances from poultry farms

that were confirmed infected with the HPAI in Lagos and Oyo States. Geographic distribution of the primary outbreak of HPAI in Nigeria showed that Lagos and Ogun States in south-western Nigeria were among those with highest numbers of poultry farms affected, while Oyo and Ondo states were least affected in this part of the country [4].

Material and Methods

Using purposive sampling method, in which pig farms within graded distance of less than 2.5km, 5km, 10km and 15km from HPAI confirmed poultry flocks, serum specimens were collected from 150 pigs within Ibadan and Lagos, Nigeria through the cranial venacava and 25 pharyngea and cloacal swabs were also obtained from April to June, 2008 and tested at the Department of Veterinary Public and Preventive Medicine, University of Ibadan (U.I). The sera were tested with Anigen Rapid AIV Ab Test kit^R(Animal Genetics, Inc.,Korea), for any of the polyclonal antibodies using the principle of "competitive chromatographic immunoassay. While the swabs were tested for H5 AIV subtype with Anigen Rapid AIV Ag Test kit^R (Animal Genetics, Inc.,Korea). All samples were tested in replicates.

Results

A total prevalence of 48.5% (n=73) of AIV polyclonal antibodies was obtained, while 0% prevalence of H5N1antigen was recorded in pigs in this study. There was higher prevalence (57.1%) of AIV antibodies among the pigs reared at less than 5km to poultry farms confirmed HPAI infected, while in pigs reared at more than 15km distance from such poultry flocks recorded the lowest prevalence of 1.4% (table 1). There was no evidence of respiratory infections among the pigs tested. Feeding and watering equipment were sometimes shared by pigs and poultry as they were owned by the same farmers.

The spatial distribution of the sampled farms and relationship with the HPAI infected were presented in figure 1.

Discussion

The results showed that although there was no active infection of avian influenza viruses among pigs tested, the high prevalence of AIV antibodies confirmed the exposure and circulation of different strains of avian influenza viruses among the pigs in this region of the country which may not be the highly pathogenic strain as indicated by none detection of H5 antigen. These findings can be attributed to the common practice of mixed poultry and piggery management and the sales disposal culling approached by some poultry farmers during the HPAI outbreak.

Conclusion

Considering the role of pigs in the genetic re– assortment of different strains of influenza viruses,there is a need for broad suveillance of influenza A viruses among human, poultry and pigs to forestall threat of human pandemic emanating from south– west Nigeria.The efforts of the animal health services thus needs more support from within and outside the country to effectively and efficiently control and stamp out the disease in Nigeria.

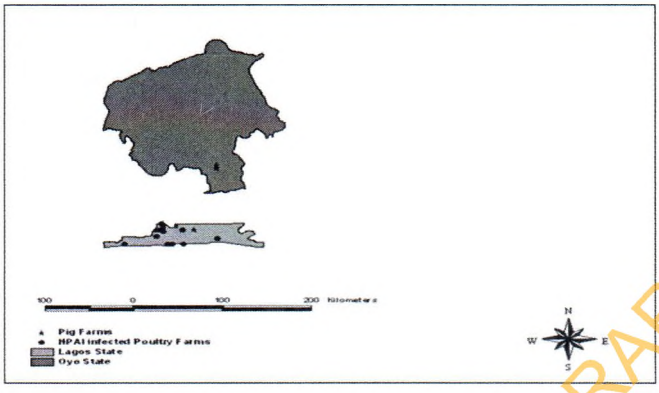

Fig. 1; Study areas in southwestern Nigeria

Tab. 1: Pig farms surveyed at five graded distances with sera AIV Ab prevalence rate

Name of pig farm	Graded distance from HPAI infected poultry farms (km)	Cordinates	Number of samples for polyclonal antibodies	Positives (%)	Negatives (%)
Oke-Aro Phase I	< 2.5km	6.6949N; 3.3206 E	20	13(65.0)	7 (35.0)
Oke-Aro Phase II		6.6907 N 3.3255 E	15	8 (53.3)	7 (46.7)
Oko-Oba Farm	< 5.0km	6.6480N; 3.3184 E	18	12 66.7)	6 (33.3)
Agege Farm		6.6255N; 3.3242 E	14	9 (64.3)	5 (35.7)
Ikorodu Farm I	< 10.0km	6.6685N; 3.34498E	12	8 (66.7)	4 (33.3)
Ikorodu Farm II		6.6663N; 3.4494 E	17	9 (52.9)	8 (47.1)
Pig-Estate Complex I	< 15.0km	6.6064N; 3.6324 E	20	8 (40.0)	12 (60.0)
Pig-Estate Complex II		6.6077 N; 3.6368 E	12	5 (41.7)	7 (48.3)
University Teaching And Research Farm	Above 15.0km	7.4380N; 3.8570 E	10	0 (0.0)	10 (100.0)
Alibode Farm		7.4680N 3.8660 E	12	1 (8.3)	11 (91.7)
Total			150	73(48.7%)	77 (51.3)

References

[1] Adeola, O A; Adeniji, J A *and* Olugasa, B O *(in press):* Detection of Haemagglutination–Inhibiting Antibodies against Human H1 and H3 strains of influenza A viruses in pigs in Ibadan, Nigeria. *Zoonoses and Pubic Health*

[2] Campitelli, L; Donatelli, I; Foni, E; Castrucci, M R; Fabiani, C; Kawaoka, Y; Krauss, S *and* Webster, R G (1997)*:* Continued evolution of H1N1 and H3N2 influenza viruses in pigs in Italy. *Virology 232 (2), 310-8.*

[3]Claas, E C; Kawaoka, Y; de Jong, J C; Masurel, N *and* Webster, R G: (1994). Infection of children with avian-human reassortant influenza virus from pigs in Europe. *Virology 204, 453-457*

[4] Ekong, P S; Olugasa, B O; Oyetunde, I L; Waziri, N E; *and* Joanes, T N (2007)*:* Spatial distribution of

›rimary outbreaks of highly pathogenic avian influenza in Nigeria. *) Animal Health, Animal Welfare and Biosecurity. ᵖublished by Estonia University of Life Sciences, Aland, A. (Ed). 1, 740-743*

5] SCHOLTISSEK, C; LUDWIG, S *and* FITCH, W M (1993)*:* Analysis of influenza A virus nucleoproteins for the ıssessment of molecular genetic mechanisms leading to new phylogenetic virus lineages. *Arch. Virol. 131, 237-250*

6] SCHRADER, C *and* SÜSS, J (2004)*:* Molecular epidemiology of porcine H3N2 Influenza A viruses isolated in Germany ›etween 1982 and 2001. *Intervirology 47, 72–77*

7] WEBBY, R J; SWENSON, S L; KRAUSS, S L; GERRISH, P J; GOYAL, S M *and* WEBSTER, R G (2000)*:* Evolution ›f swine H3N2 influenza viruses in the United States. *J. Virol. 74(18), 8243-51.*