CairoUniversity
Faculty of Veterinary Medicine
Department of Poultry Diseases

MOLECULAR EPIDEMIOLOGICAL STUDIES ON THE CURRENT STATUS OF AVIAN INFLUENZA VIRUS (H5N1) IN POULTRY IN EGYPT

A thesis presented by

AHLAM ABD-EL HALIM MOUSTAFA MOURAD

B.V. Sc. (2009) Cairo University
M.V. Sc. (2012) zagazig University

For the degree of Ph.D.

Veterinary Medical Sciences

(Poultry and Rabbits Diseases)

Under Supervision

Of

Prof. Dr. Diaa El-Dein Gad Ahmed Khelfa

Professor of Poultry and Rabbit Diseases
Department of Poultry Diseases
Faculty of Veterinary Medicine
Cairo University

Dr. Samir Abd-EL Moez Abd-El Wanees

Chief researcher of Poultry and Rabbit Diseases
Central Laboratory for Evaluation of Vet. Biologics
(CLVEB)

Dr. Khaled Madian Diab

Assistant Professor of Poultry and Rabbit Diseases
Department of Poultry Diseases
Faculty of Veterinary Medicine
Cairo University

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Supervision sheet

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Cairo University
Faculty of Veterinary Medicine
Department of Poultry Diseases
Name: Ahlam Abd-El halim Moustafa Mourad
Nationality: Egyptian
Birth data: 5/3/1987, Al Giza
Degree: Philosophy doctor in Veterinary Medical Sciences
Specification: Poultry and Rabbit Diseases
Supervisors: Prof. Dr. Diaa El-Dein Gad Ahmed Khelfa, Dr. Khaled Madian Diab and Dr. Samir Abd-El Moez Abd-El wanees.
Title of thesis: Molecular Epidemiological Studies on the Current Status of Avian Influenza Virus (H5N1) in Poultry in Egypt.

Abstract.

This study has been pursued to better understand the epidemiological and genetic characters of HPAI viruses in the Egyptian commercial poultry flocks during the period beginning at Dec 2014 to May 2015 and to molecularly identify the predominant Highly pathogenic avian influenza(HPAI H5N1) strain(s) via field investigation for monitoring of different outbreaks of suspected AI infection in different poultry farms, the mortality rate ranged from 50 to 100 %,39 out of 52 samples were positive for HPAI H5N1 (75%) with 9 highly positive samples with Cq ranged from 8.40 to 13.89, The same 39 samples caused deaths of the embryos within 18-36 hr , post inoculation (PI) with positive rapid HA test. The phylogentic analysis revealed that the 9 HPAI H5N1 strains formed a new distinct monophyletic group within 2.2.1.2 clade. One strain out of 39 positive HPAI H5N1 cases, was free from other respiratory viral infection specially H9N2, NDV and IBV, it was titrated using SPF ECE and its titer was 10^8/ml EID_{50}. Then the pathogenic effect of the predominant HPAI H5N1 A/duck/Egypt/CLEVB-24_N00238/2015 was tested in SPF chickens and the course of the disease was rapid and very severe as the mortality begin at the 2nd DPI and reached to 100% at the 3rd DPI. The clinical signs , post mortem lesions, histopathological examination was recorded, as well as the virus was detected in all freshly dead chickens by real time RT-PCR using specific H5gene primer. The efficacy of 5 commercially available inactivated AI (H5N1, H5N2 and H5N3) vaccines were evaluated against challenging with the current our recently isolated HPAI H5N1 (A/duck/Egypt/CLEVB-24_N00238/2015) field strain using both SPF and broiler chickens. SPF groups were vaccinated at 21st day old while broiler groups were vaccinated at 10th day old, the serological response was evaluated on weekly bases using HI test also, virus shedding titter was detected by real time RT- PCR, result revealed that 3 vaccines poulvac H5N3, Nobilis H5N2 and Re-5 H5N1 AI vaccines were protective and – induced significant reduction in the titter of the shedding virus (more than 2 logs) compared to the non-vaccinated challenged groups in both broiler and SPF chickens. Finally the efficacy of the recombinant HVT-H5 avian influenza vaccine expressing the H5 gene from a clade 2.2 HPAIV H5N1 strain (rHVT-H5) was tested in both specific pathogen free (SPF) and commercial broiler chicks against challenging with the current recently isolated HPAI H5N1 field strain and our results declared that the protection percentage in both SPF and broiler groups were 70% and 60% .**Keywords:** Avian influenza virus (AIV), H5N1, Highly Pathogenic Avian Influenza (HPAI), pathogenicity, broiler, vaccine and vaccination.

Dedication

My Father,

My Mother,

My Sisters,

My brother and my best friends

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