

Prevalence of avian influenza in three selected upazilas of Barisal district in Bangladesh

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ABSTRACT

The purpose of this work was to identify the avian influenza virus (AIV) and to know prevalence AIV of poultry in Barisal district, Bangladesh. The present study was conducted in three selected upazilla of Barisal district (Sadar, Bakerganj and Banaripara). Cloacal and tracheal swabs from chickens were collected from farms of study areas. To test Avian Influenza among the samples Antigen Rapid AIV Ag Test kit (Bionote, Korea) were used. Only 2 tracheal samples were positive for AIV out of 100 samples and all the cloacal samples were negative for AIV. The study demonstrated that the prevalence of AIV was very low (2%) in the study areas. The results also indicated that there was no immediate outbreak of AIV in the representative upazila of Barisal.

INTRODUCTION

Avian Influenza is a devastating viral disease causing severe loss in poultry industries. The virus has zoonotic importance which can be transmitted from birds to human by ingestion of infected poultry meat or meat items or during processing of food and food items from avian influenza infected poultry. Avian Influenza is caused by infection with influenza. Highly pathogenic avian influenza (HPAI), also known as fowl plague. HPAI is generally characterized by high morbidity and mortality rates in gallinaceous poultry flocks with birds developing severe clinical signs, often with rapid death due to systemic replication of influenza virus with cell death in visceral organs, brain and skin (Swayne and Suarez, 2000). Clinical signs in human associated with fever (above 100.4° F), dry cough, sore throat, muscle aches, nausea, vomiting, diarrhoea, head ache,

joint pain, lethargy, nasal secretion, insomnia, eye infection etc.

Influenza viruses are widespread in the animal kingdom. Birds, humans, horses and pigs are often infected. Wild aquatic birds of the orders Anseriformes (e.g. ducks, geese, swans) and Charadriiformes (e.g. gulls, terns, waders) are traditionally considered natural hosts of most avian influenza viruses (AIV). The pathogens are assumed to be mainly transmitted via the fecal-oral route. In wild birds, infection is caused by low pathogen (LP) AIV (Olsen et al., 2006; Webster et al., 1992) and is usually asymptomatic. However, recent reports have shown that behavioral modifications brought about by infection are probably more common than previously recognized (van Gils al., 2007). Conversely, domestic birds, particularly poultry, have experienced recurrent outbreaks of highly

pathogenic (HP) AIV of the subtypes H5 and H7 (Alexander, 2000), resulting in high mortality and significant economic loss. Two main routes of transmission could be involved in AIV transmission: (i) a direct bird to-bird transmission and (ii) a waterborne transmission. For inter-individual transmission, two transmission functions are considered like usually in infectious diseases modeling. The first one is the “density-dependent” process (McCallum et al., 2001), which is the classical assumption for inter-individual transmission of wildlife diseases. According to this transmission pattern, contact rate between individuals increases when the host community size increases (assuming that host community size is correlated to the host density). For clarity, we consider here that “host community” refers to all bird species within our study area. The second pattern is “frequency dependent” inter-individual disease transmission

First outbreak in poultry occurred in 1878 in Italy and then 1883 in Pennsylvania, America, 1918 in Spanish, 1992-95 in Mexico, 1995 in Pakistan and 1997 in Hongkong (Swayne & Suarez, 2000). First outbreak (H₅N₁) in Bangladesh occurred on 5th February, 2007 in Sarisha Bari, Jamalpur (OIE) and by another report, occurred on 27 February, 2007 in Biman Poultry Complex, Savar, Dhaka (MOFL). First outbreak in human occurred in 1997 in Hong Kong (H₅N₁) and in 1999 in Hong Kong (H₉N₂) then 2003 in Hong Kong (H₅N₁), Netherlands (H₇N₇) and 2004 in Vietnam and Thailand (WHO). First human outbreak in Bangladesh occurred on 22 May, 2008.

There has been one reported HPAI outbreak (H₅N₃ virus) in wild common terns (*Sterna hirundo*) in South Africa in 1961, in which approximately 1300 of these birds died (Becker, 1966). Also, more recently, an individual case of highly pathogenic H₇ avian influenza was reported in a Saker Falcon (*Falco cherrug*) in northern Italy at the time of the H₇N₁ HPAI outbreak (Magnino et al., 2000). However experimental studies, using a zoonotic H₅N₁ avian influenza virus (A/chicken/Hong Kong/220/97) from the Hong

Kong outbreak in 1997 that had resulted in human infection and some deaths, conducted in a range of avian species showed that this virus could infect multiple avian species and its virulence varied significantly among avian species, including species from the same order (Perkins and Swayne, 2003). The purpose of this work was to identify the avian influenza virus and to know prevalence Avian Influenza virus of poultry in Barisal district, Bangladesh.

MATERIALS AND METHODS

Study area and sampling

The present study was conducted in three selected upazilla of Barisal district (Sadar, Bakerganj and Banaripara) during January 2015 to June 2015 directed from the farm and birds which were brought to FDIL (Field Diagnostic and Investigation Laboratory, Barisal, Bangladesh) for diagnosis. About 100 samples were collected both from dead and sick birds in this study. Cloacal swab were collected from live sick birds and tracheal swab from dead birds.

Sample test

To test Avian Influenza among the samples Antigen Rapid AIV Ag Test kit (Bionote, Korea) were used as per manufacturer instruction. The collected cloacal swab was inserted into the sample tube containing assay diluents and mix the swab until the sample has been dissolved into the diluents. By using the disposable dropper provided, the 4-5 drops of supernatant from extracted sample was taken into the sample hole and wait for 10 minutes for the test results (Figure 1)

The presence of only one band within the result window indicates a negative result. The presence of two color bands (“T” and “C”) within the result windows, no matter which band appears first indicates a positive result.

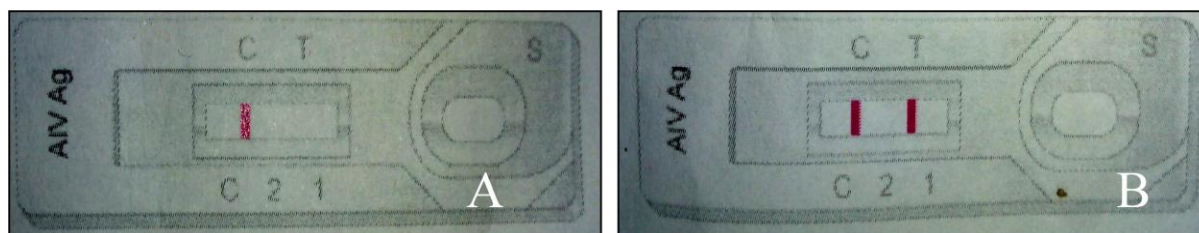


Figure 1

Detection of avian influenza by Rapid AIV Ag Test kit; negative (A), positive (B).

RESULTS AND DISCUSSION

Detection of avian influenza viruses in chicken

Only 2 tracheal samples were positive for AIV out of 100 samples and all the cloacal samples were negative for AIV. Only 2% Prevalence of AIV was observed in the studied areas. This was consistent

with the previous research work conducted in Germany during 1977-1989 periods where avian influenza viruses were isolated directly from feral ducks (Naeem et al, 1999). There were no AIV isolates obtained from cloacal and tracheal swabs of hunted wild waterfowl probably these birds did not carry AIVs.

Table 1

Avian Influenza test result in three upazilas of Barisal district.

Upazila	No of samples collected		Avian Influenza Positive	% AI
	Cloacal swab	Tracheal swab		
Barisal Sadar	25	15	0	2%
Bakerganj	14	16	1	
Banaripara	19	11	1	
Total	58	42	2	

From this study, it can be concluded that the prevalence of AIV was very low (2%) in the study areas. The results also indicated that there was no immediate outbreak of AIV in the representative upazila of Barisal.

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