Iranian Journal of Virology 2020;14(1):63-65

Letter to Editor

Molecular Surveillance of Infectious Bursal Disease virus in Live Bird Market, Tehran, Iran

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Dear Editor

Infectious bursal disease (IBD) is an acute, ubiquitous, immunosuppressive, highly contagious disease of young chickens caused by a nonenveloped double-stranded RNA birnavirus belonging to the Birnaviridae family and Avibirnavirus genus named infectious bursal disease virus (1, 2).

The IBDV is characterized by a bipartite dsRNA genome (segments A and B), and five proteins have been identified in IBDV (VP1, VP2, VP3, VP4 & VP5) (2). Two serotypes of the virus (serotypes 1 and 2) have been described, and antigenic variants of both sero-types have been recognized (1). However, only Serotype 1 is pathogenic for chickens and can be further divided based on antigenicity/ genetic aspects and level of pathogenicity (2). Serotype 2 viruses are naturally avirulent, and reports have shown that serotype 2 of IBDV is more prevalent in many free-living wild birds, with the natural host considered turkeys (2). serotype 1 virus was isolated from ostrich, waterfowl (3), magpie (4), pigeon, guinea fowl (5), and quail (6) in experimental and field conditions.

The species that might be concerned about the spread are duck, gull, crow, and pigeon. However, there is little evidence of their involvement in initial incursions or spread between farms in outbreaks. Fomites appear to be the main means of spreading in an outbreak (7). Naturally occurring infections of turkeys and ducks by serotype 2 and serotype 1 viruses, respectively, have been recorded (3, 8-10). The present study aimed to detect IBDVs in different species of birds, such as backyard chicken, turkey, duck, and swan goose in the LBM of Tehran city in Iran.

This cross-sectional survey was conducted in the fall 2020 in a LBM of Tehran city in Iran. A total number of 105 Cloacal swabs samples were collected from different backyard poultry, including chicken, turkey, duck, and swan goose. Using a cold chain, swab samples were transferred to the Microbiology Laboratory of Veterinary Medicine Faculty of Tehran University.

For RNA extraction, every five swab samples were pooled, and RNA was extracted using Sinaclon RNA extraction kit. The extraction was performed based on the manufacturer's instructions.

Using RT-PCR assays, the extracted RNA was screened for IBDV using two primer pairs. The first one amplifies a 743 bp region of the VP2 gene, the forward primer was 5′- CCCAGA-GTCTACACCATA-3′, and the reverse primer was 5′-TCCTGTGCCACTCTTTC-3′; and the second one region of VP4 gene, the forward primer was 5′-ATGCTCCAGATGGGGTAC-TTC-3′, and the reverse primer was 5′-TTGGACCCGGTGTTCACG-3′.

None of the 105 Cloacal swabs samples were positive for VP2 and VP4 viral genes. It means none of the IBDV related to both serotypes A & B were not detected in samples. Positive

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control samples created a sharp bond on electrophoresis gels.

Poultry production provides an important source of high-quality animal protein.

However, the high occurrence of infectious diseases among the poultry, especially those on smallholdings, poses a great danger to their productivity and survival. The infectious bursal disease has been reported in other avian species other than chicken without observation of clinical signs indicative of infection; however, they have been indicated to have the ability to support the replication of the virus. Based on serological evidence of IBDV serotype I in wild birds, it has been suggested that wild birds may be a critical player in the epidemiology of IBDV and may act as a reservoir for the IBDV (11). Poultry product wastes exposed on industrial or domestic waste disposal sites are likely to be consumed, if at all, by species that do not also congregate at poultry premises (7). Chickens experimentally infected with the other viruses isolated from other birds, including duck, goose, and sparrow, survived, but their bursas were damaged, and the bursa/body-weight ratios were lower than those of the uninfected control (12). Usage of live vaccines is blamed for being responsible for the spillover of viral vaccines from poultry into wild birds (1).

These findings highlight the potential roles of wild and backyard birds in the spread of IBDV. LBMs are popular places all over the world that receive live poultry to be resold or slaughtered and sold on-site. As illustrated by the results of some epidemiological studies, LBMs can play a key role in spreading infectious diseases among bird species (13).

Periodical assessment of the regional status of virus in LBMs should be considered to upgrade field knowledge regarding disease occurrence in the backyard, wild-birds, and poultry farms; so this study should be repeated here in after.

Acknowledgment

We acknowledge Mr. Asadi for his technical supports for the experiment.

Conflict of interest

The authors declare that they have no conflict of interest.

Funding

None.

References

1. Eterradossi NaS, Y.M. Infectious Bursal Disease. In Swayne DE, Boulianne M, Logue CM, McDougald LR , Nair V, Suarez DL, editors: Diseases of Poultry. Vol 14. New York; JohnWiley & Sons; 2020. p.257-83.

2. Orakpoghenor O, Oladele SB, Abdu PA. Infectious Bursal Disease: Transmission, Pathogenesis, Pathology and Control-An Overview. World Poultry Sci J. 2020: 76(2):292-303.

3. McFerran JB, McNulty MS, McKillop ER, Connor TJ, McCracken RM, Collins DS, et al. Isolation and serological studies with infectious bursal disease viruses from fowl, turkeys and ducks: demonstration of a second serotype. Avian Pathol. 1980;9(3):395-404.

4. Jeon W-J, Lee E-K, Joh S-J, Kwon J-h, Yang C-B, Yoon Y-S, et al. Very virulent infectious bursal disease virus isolated from wild birds in Korea: epidemiological implications. Virus Res. 2008;137(1):153-6.

5. Kasanga CJ, Yamaguchi T, Wambura PN, Munang' andu HM, Ohya K, Fukushi H. Detection of infectious bursal disease virus (IBDV) genome in free-living pigeon and guinea fowl in Africa suggests involvement of wild birds in the epidemiology of IBDV. Virus Genes. 2008;36(3):521-9.

6. Van Den Berg T, Ona A, Morales D, Rodriguez J. Experimental inoculation of game/ornamental birds with a very virulent strain of IBDV. COST839 Rauischholzhausen, Germany. 2001:236-46.

7. Gilchrist P. Involvement of free-flying wild birds in the spread of the viruses of avian influenza, Newcastle disease and infectious bursal disease from poultry products to commercial poultry. World Poult Sci J. 2005;61(2):198-214.

8. Johnson DC, Lukert PD, Page RK. Field studies with convalescent serum and infectious bursal disease vaccine to control turkey coryza. Avian Dis. 1980;24(2):386-92.

9. McNulty MS, Allan GM, McFerran JB. Isolation of infectious bursal disease virus from turkeys. Avian Pathol. 1979;8(3):205-12.

10. Page RK, Fletcher OJ, Lukert PD, Rimler R. Rhinotracheitis in turkey poults. Avian Dis. 1978;22 (3):529-34.

11. El Naggar RFEl, Rohaim MA, Munir M. Potential reverse spillover of infectious bursal disease virus at the interface of commercial poultry and wild birds. Virus genes. 2020;56(6):705-11.

12. Wang YS, Wang ZC, Tang YD, Shi ZL, He KW, Li Y, et al. Comparison of four infectious bursal disease

viruses isolated from different bird species. Arch Virol. 2007;152(10):1787-97.
13. Rezaee H, Ghalyanchilangeroudi A, Karimi V, Fallah Mehrabadi M, Motamed Chaboki P, Shayganmehr A, et al. Molecular detection of avian infectious bronchitis viruses in live bird markets, Gilan Province. Arch Razi Inst. 2020;75(2):155-62.