

Study the Prevalence of Variant IBD Strains in Some Egyptian Chicken Farms

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Abstract: Thirty one isolates of infectious bursal disease virus (IBDV) were isolated from 32 broiler, layer and native breeds chicken farms from 7 Egyptian governorates were collected during period from September 2007 to March 2010. Out of 7 examined farms, 6 farms with history of previous vaccination against IBD with represent 85.7% and one farm without history of vaccination, which represent 14.3%. In layer farms, out of 8 examined farms, 6 farms with history of previous vaccination against IBD which represent 75% and 2 farms without history of vaccination, which represent 25%. While, in native breed's flocks out of 16 examined farms, 14 farms with previous vaccination against IBD which represent 87.5% and 2 farms without history of vaccination which represent 12.5%. The main clinical signs were acute onset of depression, ureates, feed intake is depressed while water consumption elevated. At the end of the course of the disease, birds may show sternal or lateral recumbence with tremor. On necropsy, dehydration of the subcutaneous fascia and pectoral musculature were observed in chicken after infection by acute IBD, and also the kidney showed enlargement and paler with accumulation of crystalline ureate in tubules, visible as white flocks beneath the capsule. Hemorrhages in the mucosa of the proventriculus and acute bursal enlargement were observed but infection result in rapid and profound atrophy.

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1. Introduction

Infectious bursal disease (IBD) is an acute highly contagious viral disease of young chickens characterized by enlargement of the bursa of fabricius and severe renal damage. It has a striking involvement to primary lymphoid organ in the form of lymphocytic necrosis substituted with polymorphonuclear cells with severe hemorrhages and oedema (*Ivanyi; and Morris 1976*). The disease was described as a specific new disease by (*Cosgnove 1962*) and was referred to as avian nephrosis. Later it was termed as infectious bursal disease referring to the specific lesion caused by the disease in cloacal bursa (*Hitchner, 1970*) The acute IBD emerged in the late 1980s (*Jackwood et al., 1982*); IBD was first reported in Egyptian flocks in the early seventies (*El-Sergany et al., 1974*) however interest in IBDV antigenic characterization was triggered by the appear once of the very virulent IBD in vaccinated Egyptian flocks (*El-Batrawi and El-Kady 1990; Khafagy et al., 1991*). Several reports have classified the Egyptian IBDV isolates as classical IBDV (*Khafagy et al., 1991; Bakhit, 1996*). On the other hand, some reports have provided partial evidence of the presence of antigenically variant IBD strains in Egyptian flocks (*El-Sonousi et al., 1994; & Sultan 1995*). Presently, evidence of circulating variant IBDV strains were isolated from flocks vaccinated using classical IBDV vaccines (*El-Khiat, 2003; Hussein et al; 2003 and Metwally et al; 2003*).

Variant strains of IBDV are usually isolated from vaccinated flocks. These IBDV variant are antigenically different from classic strains of IBDV; as it is devoid the classical epitope (s) defined by neutralizing monoclonal antibodies (*Snyder et al., 1988, Snyder, 1990; and Snyder et al., 1992*). So the aim of this study was carried out to investigate the possibility of the variant outbreak in chicken flocks.

2. Material and Methods:

Field virulent viruses:

Bursa from morbid and freshly dead birds up to 3 weeks of age were collected from chicken showing symptoms suspected to be IBD infection from some governorates in Egypt organs and were collected under aseptic condition.

IBD Variant viruse:

Variant IBDV kindly provided by Dr. Monier El-Safty, SPF Dept. Central Lab for Evaluation of Vet. Biologics (CLEVB)

SPF embryonated chicken eggs (ECE):

One day old specific pathogens free (SPF). The eggs were obtained from the SPF production farm, Koum Oshiem, Fayoum, Egypt. It kept in the egg incubator at 37°C with humidity 40-60% till the age of 9-11 day old and was used in this study.

3. Experiments and Results:

Study the prevalence of IBD in Egyptian chicken farms:

This experiment was done to investigate the present status of a variant IBD in some governorates in Egypt, table (1)

The present data represent prospective survey of the presence of IBD in 31 Chicken farms. The data collected from 7 governments during 2.5 years stated from September 2007 to March 2010. The samples included 6 broiler, 7 layer 11 native breeds' commercial farms in different locality and edging from 7 days up to 23 days.

Out of 32 samples only one sample was negative and the other 31 were positive. In broiler farms (table 1) out of 7 examined farms 6 farms with history of previous vaccination, which represent 14.3%.

In layer farms (table 1) out of 8 examined farms, 2 farms with history of previous vaccination against IBD which represent 75% and 2 farms without history of vaccination, which represent 25%.

In native breeds (table 1) out of 16 examined farms, 14 farms with previous vaccination against IBD which represent 87.5% and 2 farms without history of vaccination which represent 12.5%. The main clinical signs were acute onset of depression, disinclined to move and peck at their vents. Pericoloacal feathers are stained with ureates feed intake is depressed while water consumption may be elevated. At the end of the course of the disease, birds may show sternal or lateral recumbency with coarse tremor.

Table (1) Prevalence of the IBDV in some chicken farms

No	Governorate	Type	Age	Capacit	IBD Vacc.	Signs & P/M
1	Kalyobia	Broiler	10 days	5000	Not Vacc.	Dehydration, depression proventriculitic
2	Kalyobia	Layer	18 days	5000	Intermediate	White diarrhea, depression bursitis
3	Sharkia	Layer	14 days	10000	Intermediate	Disinclined to move, pack at vents; ureate in
4	Kalyobia	Baladi	7 day	5000	Not Vacc.	Dehydration, depression proventriculitic
5	Menia	Saso	17 day	4000	Intermediate	Pericoloacal feathers stained ureates and
6	Monufia	Broiler	15 day	15000	Intermediate	Pericoloacal feathers stained ureates and
7	Menia	Broiler	14 day	1000	Intermediate	Disinclined to move, pack at vents ureate in
8	Giza	H & N	20 day	60000	Mild *	Pericoloacal feathers stained ureates and
9	Fayoum	Saso	17 day	10000	Intermediate	Peck at vents, dehydration enlargement of bursa
10	Fayoum	Layer	8 day	10000	Not Vacc	Dehydration, depression profound atrophy of
11	Sharkia	Layer	13 day	15000	Intermediate	Pericoloacal feathers stained ureates and
12	Sharkia	Broiler	23 day	20000	Intermediate	Feed in take is depressed accumulation of ureate
13	Sharkia	Broiler	20 day	25000	Intermediate*	Peck at vents, dehydration enlargement of bursa
14	Fayoum	Saso	19 day	10000	Intermediate*	Peck at vents, dehydration enlargement of bursa
15	Gharbia	Baladi	19 day	20000	Intermediate	Dehydration, depression ureates and enlargement
16	Giza	Saso	15 day	10000	Intermediate	Disinclined to move, peck at vents ureate in
17	Giza	Layer	18 day	15000	Mild	Dehydration, depression Haemorrhages in
18	Gharbia	Saso	18 day	10000	Intermediate	Pericoloacal feathers stained ureates and
19	Fayoum	Baladi	14 day	25000	Intermediate	Disinclined to move, peck at vents ureate in
20	Monufia	Broiler	21 day	10000	Mild*	Feed intake is depressed accumulation of ureate
21	Sharkia	Saso	17 day	20000	Intermediate	Pericoloacal feathers stained ureates and
22	Menia	Layer	21 day	10000	Intermediate	Feed intake is depressed accumulation of ureate
23	Gharbia	Saso	17 day	10000	Intermediate	Peck at vents, dehydration enlargement of bursa
24	Monufia	Baladi	8 day	15000	Not Vacc	Dehydration, depression proventriculitic
25	Fayoum	Baladi	10 day	50000	Mild	Dehydration, depression proventriculitic
26	Kalyobia	Saso	12 day	12000	Intermediate	Dehydration, depression proventriculitic
27	Kalyobia	Saso	9 day	15000	Intermediate	Feed intake is depressed accumulation of ureate
28	Fayoum	Saso	8 day	5000	Intermediate	Feed intake is depressed accumulation of ureate
29	Kalyobia	Baladi	10 day	15000	Mild	Feed intake is depressed accumulation of ureate
30	Fayoum	Layers	8 day	10000	Not Vacc	Feed intack is depressed accumulation of ureate
31	Sharkia	Broiler	12 day	10000	Intermediate	Dehydration
32	IBD variant 2 kindly obtained from the CLEVB**					

*The birds were vaccinated twice

**This sample was isolated from non vaccinated farm

N.B.: All farms were reared on floor system

On necropsy, dehydration of the subcutaneous fascia and pectoral musculature were observed in chicken after infection by acute IBD, and also the kidney showed enlargement and paler with accumulation of crystalline ureate in tubules, visible as white flecks beneath the capsule. Hemorrhages in the mucosa of the proventriculus were seen at the margin of the ventriculus. Beside, acute bursal enlargement was observed but infection result in rapid and profound atrophy.

4. Discussion:

Infectious bursal disease (IBD) is caused by a virus that is a member of the genus Avibirnavirus of the family Birnaviridae. Although turkeys, ducks, Guinea fowls and ostriches may be infected, clinical disease occurs solely in chickens. Only young birds are clinically affected. Severe acute disease of 3-6 weeks old is associated with high mortality, but less acute secondary problems may be due to the effect of virus on the bursa of Fabricius.

IBDV causes lymphoid depletion of the bursa, and if this occurs in the first 2 weeks of life, the significant depression of the humeral antibody response may result. (Winterfield and Thacker 1978 and Ismail et al., 1988). The variant isolates were studied by (Ismail et al., 1988) that was isolated from 39-43 day old commercial pullets in USA and recovered using SPF chickens and the BGM-70 established cell line. Moreover, in

Egypt variant viruses were isolated and genomically identified from 13-30 day old broiler chickens showing proventriculitis by RT-PCR (Amer and Nassif 2005).

Despite some flocks were vaccinated with different types of IBD vaccines some flocks below 3 weeks of age, exposed to the infection. So, our study was full fill for study the prevalence of variant IBD in some Egyptian chicken farms. Among 7 governorates 32 chicken farms were investigated during 2.5 years at 7-23 day old either broiler or layers flocks. The main clinical signs were acute of depression, disinclined to move and peck at their vents. Pericloacal feathers are stained with ureates feed intake is depressed while water consumption may be elevated. The end of the course of the disease, birds may show sternal or lateral decumbency with coarse tremor. Out 30 flocks, five farms did not vaccinated against IBD (table 1) represent 15.6% from the total examined farms, the other vaccinated with different types of vaccines. On necropsy, dehydration of the subcutaneous fascia and pectoral musculature were observed in chicken after infection by acute IBD, and the kidney show enlargement and paler with accumulation of crystalline ureate in tubules, visible as white flecks

beneath the capsule. Hemorrhages in the mucosa of the proventriculus at the margin of the proventriculus. Not acute bursal enlargement was observed but infection result in rapid and profound atrophy.

On the other hand, some reports have provided evidence of the presence of antigenically variant IBDV strains including detection of non neutralizing epitope "BK9" which is present on Del/E variant. Recognition of Del/E and RS593 by monoclones was done by (El Khat, 2003). Recognition of Del/E and other variants by molecular biology was carried out by (Metwally et al., 2003). Moreover, isolation of Del/E associated with proventriculitis (Hussein et al., 2003). Circulation of variant IBDV in broiler flocks in Egypt was detected by RT/PCR-RFLP assay (Khalil and Sharawi, 2004). Isolation of del/E variant strain associated with proventriculitis using RFLP assay on PCR product (Amer and Nassif, 2005 & Makadiya et al. 2006) identified variant IBD isolate using monoclonal antibody. Regarding on isolation and identification of 32 isolates from broilers and layers age 7-23 day old chicken, bursa were collected from recently died chicks from farms in different Egyptian governorates and inoculated in 9-11 days SPF eggs, and the examined embryos showed stunting and off white creamy colour and cerebral and abdominal oedema, rarely hemorrhagic, little dwarfing and bile stasis in liver. The spleen was generally enlarged two of three times but with normal color these embryonic changes are in agreement with (Rosenberger et al., 1998).

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