






Policy of control and prevention of infectious bursal disease at poultry farm

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Abstract

Infectious Bursal disease or IBD is a common disease in poultry which is effecting birds specially hen, turkey and other species of poultry birds. It is caused by a virus called Birna Virus as virus belongs to family of Birna viridae. This virus effecting many birds in a year and becoming the cause of high mortality of birds if we don't follow the precautionary measure it will cause 40-50% mortality. This study will give a policy which should be adopt in order to minimize the risk of IBD. By following the policies which are mentioned in this study you can manage the flock which is infected by IBD. We also tried that policy on infected birds and we got remarkable results we saw that these policies save birds from IBD and also help to recover sick birds. So our that study is for our farmers and poultry industrialist who get knowledge by reading this. We this study bring revolution to fight against IBD. This study is research based and completely original so it will help to reduce the risk of viral infection.

Keywords: Bursa of bird, Birna virus, Birna viradae, Policy against IBD, Ratio of mortality

1. Introduction

Infectious Bursal disease is caused by a virus called *Birna virus* which is common in al over world. In this type of disease bursa is badly affected by the virus. As we know that B cell formed in bursa in this bursa damage by the virus so there will be lack of B cells in the body. B cells are performing vital role in immunity so if there will be less B Cells in the body immune system will be weak. IBD mostly effects a bird between the age of 14th -28th day (Bolis et al., 2003). The causative agent of IBD Birna virus was identified in the United States of America in 1962. If Virus enters in a farm approximately all birds of the farm would be effect by the IBD but mortality rate of these disease is approximately 20%. IBD effects Layer hen at the age of 2-6th weeks (Muller et al., 2003). White leghorn is highly

effected by this disease while the local breeds are less effect by IBD. If you do not Manage the temperature of Vaccine it will not be effective as we know that vaccine contain microbes and microbes die at high temperature (Lasher & Davis., 1997). So we should manage the temperature of Vaccine otherwise vaccine will not be effective. If we don't manage the Vaccine Temperature and if don't handle the Vaccine properly it may also cause disease in birds so it's very necessary to handle vaccine properly for best results (OIE., 1995).

The aims of that studies are

- ★ To highlight the cause and Solution infectious Bursal Disease.
- ★ To give the proper policy for controlling disease or preventing disease

So that industrialist and farmer save them from big loss.

1.1. Other names:

❖ **Gumboro**

- ❖ **Avian AIDS** as it destroys immune system by suppressing bursa and Thymes gland. It kills B cells and cause immunosuppression (Mahgoub et al., 2012).

1.2. Transmission route of disease

Disease is transmit though feces, or by eating of contaminated feed or drinking contaminated water (Abdel-Alim & Saif., 2001). Generally feces are major source of the transmission of IBD as feces contain higher amount of virus. IBD transmit doors to doors by fomites. There are two serotype of IBD (Delmas et al., 2004). Serotype1 which effects Chicken. While serotype 2 effects waterfowl and hens both but waterfowl are more resistive against this disease (Lukert & Saif, 2003). As this disease is immunosuppressive it decrease the immune system's efficiency so other diseases also attacks on the bird. Mostly Newcastle disease, IBH, CRD, Marek's and IB attacks on bird when IBD minimize immunity (Zierenberg et al., 2004). IBD also found in some other birds like penguin etc. but it did not cause any disease or symptoms in them (Zierenberg et al., 2004).

1.3. Clinical signs of IBD

Stress, Anorexia, Dehydration, White pasty diarrhea, Laziness, and Bird will not eat feed during IBD. (Chaka et al., 2012).

1.4. Lesions

Enlargement of Bursa (Hernandez et al., 2008). Haemorrhages or atrophy of Bursa. Haemorrhages on Thigh muscles. Dehydration. Swollen kidney (Campbell., 2001; Lowenthal et al., 2007; Sharma & Kim., 2000; Jackwood & Sommer, 2010). May leads to kidney failure. Swollen urates (Pages-Mante et al., 2004; Nunoya et al., 1992; YIP et al., 2012).

2. Method and material

2.1. Diagnose

IBD can be diagnose by PCR v2 gene is detected. Isolation of virus technique. Postmortem .ELISA. Calculation Antibody counts through serological technique.

2.2. Treatment of disease

As we know that there is no treatment for viral diseases so there is no treatment for IBD but we can minimize the effect of disease by doing following practices (Etteradossi & Saif, 2013; OIE., 2004; Kim et al., 2000; Ignjatovic et al., 2001).

2.3. Flushing of bird.

Use of antibiotic which may inhibit the secondary infection through bacteria. Use of Multivitamin especially Vitamin E (Tocopherol) and Vitamin C (Ascorbic acid) (Skeeles et al., 1980; Henry et al., 1980; Van den et al., 2004). Use salted water or ORS which may help chick to meet salt and water requirement of the bird. Supporting therapy (OIE., 2012; Brandt et al., 2001).

2.4. How to do flushing of bird

Add 4% sugar in the water. Temperature of water should be moderate. Use that water within 3-4 hour (Kanoblic al., 2000; Jackwood., 2004).

2.5. What is supporting therapy?

In this we gave bird 1/3 ratio of milk and water in which some multivitamins are added this therapy will support bird to fight against disease (Wu et al., 2007; Zierenberg et al., 2000).

3. Control of disease

There are couple of methods in order to control the disease

- ★ Biosecurity.
- ★ Immunization (Vaccination).

3.1. Biosecurity

Word Bio means Life and Security means to secure, collectively Bio security means the protect birds from living organisms like microbes and other harmful organisms. The biosecurity is defined as set of practices which are done in the farm in order to save from living organisms. There are some practices by which we can save our flock from microbes

- ★ Fumigation, Sanitation and disinfection of farm and farm equipment should be done after every flock.
- ★ Don't allow anyone in the farm without sanitation.
- ★ Use sanitized equipment.
- ★ Give hygienic feed and water to bird.
- ★ Use B, BB, BBB Level of biosecurity according to your requirement.

3.2. Vaccination

Vaccination of IBD should be done at the age of 14 day. There should be two doses of vaccination for IBD one on 14th day other dose on 28th day as a booster dose. It will provide immunity to the bird.

3.3. Precautions

There are some precautions while performing vaccination (Jackwood & Sommer., 2005; Jackwood & Sommer., 2007). Use always sanitized and clean container for vaccination (Van et al., 2000; Dacic et al., 2008; Farooq et al., 2003). Check the bird is there any sign of IBD if yes than do not vaccinate to the bird as it may cause high mortality ratio as virus of IBD already present in the body by this vaccine it would be stronger (Dormitorio et al., 2007; Letzel et al., 2007). All bird should be vaccinated for this add color dye to water Color on beak will determine that those bird drink water having vaccine (Muller et al., 2012; Rautenschlein et al., 2007; Lasher & Shane,1994).

4. Conclusion

This Policy paper show or give the method of Controlling Infectious Bursal Disease. This paper will provide complete guidance to students about IBD and this paper will also help the poultry industry to overcome IBD and save themselves from Big Loss. A study was done by us we studied on 1000 birds which were effected by IBD we follow the above mentioned policy we got remarkable results.

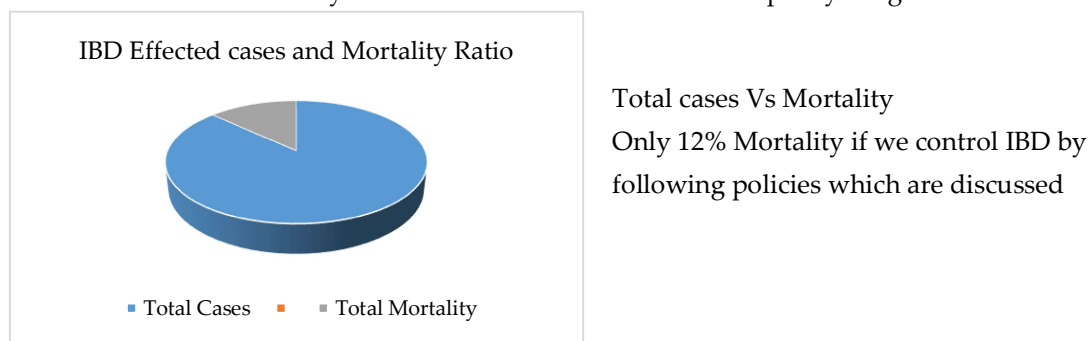


Figure 1: Effect of above policy on mortality

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References

1. Abdel-Alim, G. A., & Saif, Y. M. (2001). Detection and persistence of infectious bursal disease virus in specific-pathogen-free and commercial broiler chickens. *Avian diseases*, 646-654.
2. Bolis, D. A., Paganini, F. J., Simon, V. A., Zuanaze, M. F., Scanavini Neto, H., Correa, A. R. A., & Ito, N. M. K. (2003). Gumboro disease: evaluation of serological and anatomopathological responses in vaccinated broiler chickens challenged with very virulent virus strain. *Brazilian Journal of Poultry Science*, 5, 137-146.

3. Brandt, M., Yao, K., Liu, M., Heckert, R. A., & Vakharia, V. N. (2001). Molecular determinants of virulence, cell tropism, and pathogenic phenotype of infectious bursal disease virus. *Journal of virology*, 75(24), 11974-11982.
4. Campbell, G. (2001, June). Investigation into evidence of exposure to infectious bursal disease virus (IBDV) and chick infectious anaemia virus (CIAV) in wild birds in Ireland. In *International Symposium on Infectious Bursal Disease and Chicken Infectious Anaemia*, Rauischholzhausen, Germany (pp. 16-20).
5. Chaka, H., Goutard, F., Bisschop, S. P., & Thompson, P. N. (2012). Seroprevalence of Newcastle disease and other infectious diseases in backyard chickens at markets in Eastern Shewa zone, Ethiopia. *Poultry Science*, 91(4), 862-869.
6. Dačić, M., Žugić, G., & Petković, J. (2008). The effects of a Gumboro disease control program on the reduction of economic losses. *Acta veterinaria*, 58(1), 53-62.
7. Delmas, B., Kibenge, F., Leong, J., Mundt, E., & Vakharia Vet al. (2004). Birnaviridae. In: Fauquet CM, Mayo MA, Maniloff J (ed). *Virus Taxonomy Eighth Report of the International Committee on Taxonomy of Viruses*. 561-569.
8. Dormitorio, T. V., Giambrone, J. J., Guo, K., & Jackwood, D. J. (2007). Molecular and phenotypic characterization of infectious bursal disease virus isolates. *Avian diseases*, 51(2), 597-600.
9. Eterradossi, N., & Saif, Y. M. (2013). Infectious bursal disease. *Diseases of poultry*, 219-246.
10. Farooq, M., Durrani, F. R., Imran, N., Durrani, Z., & Chand, N. (2003). Prevalence and economic losses due to infectious bursal disease in broilers in Mirpur and Kotli districts of Kashmir. *Int. J. Poult. Sci*, 2, 267-270.
11. Lasher, H. N., & Shane, S. (1994). Infectious bursal disease. *World's Poultry Science Journal*, 50(2), 133-166.
12. Henry, C. W., Brewer, R. N., Edgar, S. A., & Gray, B. W. (1980). Studies on infectious bursal disease in chickens: 2. Scoring microscopic lesions in the bursa of Fabricius, thymus, spleen, and kidney in gnotobiotic and battery reared White Leghorns experimentally infected with infectious bursal disease virus. *Poultry Science*, 59(5), 1006-1017.
13. Ignjatovic, J., Sapats, S. I., & Gould, G. (2001). *Detection of vvIBDV strains and Australian variants in poultry*. Rural Industries Research and Development Corporation.
14. Jackwood, D. J. (2004). Recent trends in the molecular diagnosis of infectious bursal disease viruses. *Animal Health Research Reviews*, 5(2), 313-316.
15. Jackwood, D. J., & Sommer, S. E. (2005). Molecular studies on suspect very virulent infectious bursal disease virus genomic RNA samples. *Avian diseases*, 49(2), 246-251.
16. Jackwood, D. J., & Sommer-Wagner, S. E. (2010). Detection and characterization of infectious bursal disease viruses in broilers at processing. *Preventive veterinary medicine*, 97(1), 45-50.
17. Jackwood, D. J., & Sommer-Wagner, S. (2007). Genetic characteristics of infectious bursal disease viruses from four continents. *Virology*, 365(2), 369-375.
18. Kim, I. J., You, S. K., Kim, H., Yeh, H. Y., & Sharma, J. M. (2000). Characteristics of bursal T lymphocytes induced by infectious bursal disease virus. *Journal of virology*, 74(19), 8884-8892.
19. Lasher, H. N., & Davis, V. S. (1997). History of infectious bursal disease in the USA: the first two decades. *Avian diseases*, 11-19.

20. Letzel, T., Coulibaly, F., Rey, F. A., Delmas, B., Jagt, E., van Loon, A. A., & Mundt, E. (2007). Molecular and structural bases for the antigenicity of VP2 of infectious bursal disease virus. *Journal of virology*, 81(23), 12827-12835.
21. Mahgoub, H. A. (2012). An overview of infectious bursal disease. *Archives of virology*, 157(11), 2047-2057.
22. Müller, H., Islam, M. R., & Raue, R. (2003). Research on infectious bursal disease—the past, the present and the future. *Veterinary microbiology*, 97(1-2), 153-165.
23. Müller, H., Mundt, E., Eterradossi, N., & Islam, M. R. (2012). Current status of vaccines against infectious bursal disease. *Avian Pathology*, 41(2), 133-139.
24. Nunoya, T., Otaki, Y., Tajima, M., Hiraga, M., & Saito, T. (1992). Occurrence of acute infectious bursal disease with high mortality in Japan and pathogenicity of field isolates in specific-pathogen-free chickens. *Avian Diseases*, 597-609.
25. OIE (1995) Office International des Epizooties - Resolution No. XVIII. Progress in the diagnosis and control of serious poultry diseases: Salmonellosis and Gumboro disease. *Bull. OIE* 107 (5): 363-364.
26. OIE (2012) Office of International des Epizooties. Manual of Diagnostic Tests and Vaccines for Terrestrial Animals. Infectious Bursal Disease 3(12): 549-565.
27. Pagès-manté*, A., Torrents, D., Maldonado, J., & Saubi, N. (2004). Dogs as potential carriers of infectious bursal disease virus. *Avian Pathology*, 33(2), 205-209.
28. Rautenschlein, S., von Samson-Himmelstjerna, G., & Haase, C. (2007). A comparison of immune responses to infection with virulent infectious bursal disease virus (IBDV) between specific-pathogen-free chickens infected at 12 and 28 days of age. *Veterinary immunology and immunopathology*, 115(3-4), 251-260.
29. Sharma, J. M., Kim, I. J., Rautenschlein, S., & Yeh, H. Y. (2000). Infectious bursal disease virus of chickens: pathogenesis and immunosuppression. *Developmental & Comparative Immunology*, 24(2-3), 223-235.
30. Skeeles, J. K., Slavik, M., Beasley, J. N., Brown, A. H., Meinecke, C. F., Maruca, S., & Welch, S. (1980). An age-related coagulation disorder associated with experimental infection with infectious bursal disease virus. *American Journal of Veterinary Research*, 41(9), 1458-1461.
31. Van den Berg, T. P., Morales, D., Eterradossi, N., Rivallan, G., Toquin, D., Raue, R., ... & Müller, H. (2004). Assessment of genetic, antigenic and pathotypic criteria for the characterization of IBDV strains. *Avian Pathology*, 33(5), 470-476.
32. Berg, T. P. V. D. (2000). Acute infectious bursal disease in poultry: a review. *Avian pathology*, 29(3), 175-194.
33. Van den Berg, T. P., Eterradossi, N., Toquin, D., & Meulemans, G. (2000). Infectious bursal disease (Gumboro disease). *Revue scientifique et technique (International Office of Epizootics)*, 19(2), 509-543.
34. Ching Wu, C., Rubinelli, P., & Long Lin, T. (2007). Molecular detection and differentiation of infectious bursal disease virus. *Avian diseases*, 51(2), 515-526.
35. Yip, C. W., Hon, C. C., Zeng, F., & Leung, F. C. C. (2012). Cell culture-adapted IBDV uses endocytosis for entry in DF-1 chicken embryonic fibroblasts. *Virus research*, 165(1), 9-16.
36. Zierenberg, K., Nieper, H., Van den Berg, T. P., Ezeokoli, C. D., Voss, M., & Müller, H. (2000). The VP2 variable region of African and German isolates of infectious bursal disease virus: comparison

with very virulent, "classical" virulent, and attenuated tissue culture-adapted strains. *Archives of Virology*, 145(1), 113-125.

37. Zierenberg, K., Raue, R., Nieper, H., Islam, M. R., Eterradossi, N., Toquin, D., & Müller, H. (2004). Generation of serotype 1/serotype 2 reassortant viruses of the infectious bursal disease virus and their investigation in vitro and in vivo. *Virus research*, 105(1), 23-34.



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