MANAGEMENT OF VACCINE-INDUCED INFECTIOUS BURSAL DISEASE IN CHICKS WITH ANTIBIOTICS AND ANTIDIARROEICS

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ABSTRACT

An experiment was mounted to investigate if over dosing the chicks with normal infectious Bursal disease (IBD) vaccine could be responsible for some of these outbreaks of IBD in vaccinated flocks. The clinical IBD was managed with antibiotics and antidiarrhoeics in order to reduce losses. Three hundred two-week old cockerel chicks and forty two-week old turkey poults were each administered two doses of IBD vaccine of chick embryo cell culture origin. This produced clinical infectious bursal disease in the cockerel chicks but the turkey poults did not suffer clinical infection. Administration of an antibiotic- antidiarrhoeic preparation (Ampicillin trihydrate 10%; Aluminium hydroxide 80% and sodium bicarbonate 10%) at a dose of 2g per litre of water for five days reduced both morbidity and mortality from 60% and 94% (in the control groups) to 14% and 15% respectively in the experimental groups.

Keywords - Management, Infectious Bursal Disease, vaccine-induced mortality, morbidity.

INTRODUCTION

Infectious bursal disease (IBD, gumboro disease) is a highly contagious viral disease of young chicks. Chicks less than three weeks old or above fifteen weeks old are reported to be resistant to gumboro (Okoye, 1984). Ducklings and poults are also resistant to the disease (Weisman and Hitchner *et al,* 1978, Perelman *et al,* 1981 and Okoye *et al,* 1990).

IBD is characterized by sudden onset, high morbidity and high mortality. Affected birds show severe prostration, incordination, watery diarrhoea and inflamation of the claoca (Siegmund, 1979). At post mortem, gumboro is characterized by paint brush haemorrhages on the skeletal muscles of the thigh and breast, inflamation of the bursa of fabricious and prominence of the renal tubules. The inflamation of the bursa of fabricious is pathognomonic of IBD (Siegmund, 1979).

Most of the clinical signs of IBD are due to the immuno-suppressive effects of the infection (Fraser, 1991).

Control of infectious bursal disease in infected farms is usually difficult. It often occurs over and over again in such farms (Siegmund, 1979). In Nigeria, the most widely used method of control of gumboro is routine vaccination of chicks with IBD vaccine of chick embryo cell culture origin (Tong *et al,* 1992). Recently, there have been undocumented field reports of many gumboro outbreaks following vaccination. These field reports are supported by the records of higher incidence of gumboro among vaccinated flocks than among unvaccinated flocks. (Okoye, 1984; Abdu, 1986 and Tong *et al,* 1992). This paper reports an experiment mounted to demonstrate the effect of improper administration of IBD vaccine to chicks and poults and outcome of the use of an antibiotics-antidiarrhoeic drug preparation to manage gumboro outbreaks.

MATERIALS AND METHODS

Three hundred chicks (Cockerels) and forty turkey poults bought from a local hatchery in Nigeria were used for the experiment. All the chicks and poults were brooded together for the first one week. In the second week, they were randomly selected into three groups called group "A", group "B" and group "C". Group "A" comprised 100 chicks and 20 poults; group "B" comprised 100 chicks and 20 poults while group "C" comprised only 100 chicks. The three groups were brooded in different pens. On the third day of week three, the three groups were starved of water

over-night (12 hours). Two vials (800 doses) of IBD live vaccine from National Veterinary Research Institute, Vom, Nigeria were reconstituted in eight litres of chlorine free water. Two hundred and forty doses of the vaccine were evenly distributed in plastic drinkers for each of groups "A" and "B". The drinkers were equally spaced out in each pen. In group "C", one hundred (100) doses of the same reconsituted vaccine were distributed in plastic drinkers and equally spaced out in the pen.

Each of the three pens was heated and illuminated with two 60- watts electric bulbs suspended one foot above the floor and placed in such a way that the distance between the two bulbs and between each bulb and adjacent walls were equal. This ensured uniform heating and illumination within the pens. The birds were given water and feed *ad libitum*.

All the groups were examined daily for clinical signs of gumboro disease as described by Siegmund (1979). In case of mortality, the post mortem examination was carried out. Presence of any characteristic lessions of gumboro such as inflamation of bursa of fabricious, paint brush heamorrhages of the muscles of the thigh and breast and prominence of the renal tubules (Siegmund, 1979) was used as confirmatory diagnosis of gumboro.

Once the first signs of the disease was observed in group "A", the group was placed on an antibiotic - antidiarrhoeics drug, Admacine Soluble Powder (r) Sal Veterinary Services Nig. Limited). - Ampicillin trihydrate 10%, Aluminium hydroxide 80% and sodium bicarbonate 10%, at dose of 2g per litre of drinking water for five days (Ezeibe, 1994).

The birds that developed clinical infectious bursal disease were randomly divided into three groups called group "X", "Y" and "Z". Group "X" comprised 17 chicks, group "Y" comprised 40 chicks and group "Z" comprised 17 chicks. Group "X" and "Y" were kept in two separate pens. Group "Y" received feed and water and the drug at rate of 2g per litre for five days. Group "X" received only feed and water. Birds in group "Z" were given common identification and left in a pen which also had 60 healthy chicks of same breed (Cockerels) and age. Both group "Z" and the healthy chicks received feed and water and the drug at rate of 2g per litre for five days.

Morbidity rates were recorded for groups "A", "B" and "C" and mortality rates were recorded for groups "X", "Y" and "Z".

The morbidity and mortality rates in the groups were compared by chi-square test (Bishop, 1974).

RESULTS AND DISCUSSION

Clinical signs of IBD were observed among chicks in groups "A" and "B" four days post vaccination. This observation supports the three to four day incubation period of gumboro disease reported by Fraser (1991). Morbidity rates were 14% for chicks and zero for poults in group "A" and 60% for chicks and zero for poults in group "B". Failure of double doses of IBD vaccine to establish clinical infection in any of the forty poults used in the experiment supports the reports that turkeys show only subclinical infection of IBD (Weisman and Hitchner, 1978, and Prerelman *et al* 1981).

The 14% morbidity and 60% morbidity recorded in groups "A" and "B" showed that over dosing chicks with IBD vaccine disposes them to gumboro disease instead of protecting them. Over dose of IBD vaccine can result from giving the birds in a flock more than the required doses for their number as in this experiment or as a result of stronger birds drinking more than their share of the total vaccine water. The over dosed chicks may come down with the disease while those deprived of enough quantity of the vaccine in water remain susceptible to gumboro.

The excretions and secretions of those birds that develop clinical IBD within the flock would contain virulent IBD virus due to the live vaccine that have been activated by passage through the chicken cells (Okoye, 1992). These form sources of infection to the susceptible chicks. These may come down with clinical IBD few days after the first outbreak. Factors which encourage stronger

birds to drink more than necessary include improper spacing of drinkers, in adequate number of drinkers, and non uniform illumination of the pens. These may be responsible for the higher likehood of IBD among vaccinated chicks than among unvaccinated chicks observed by Okoye (1984) and Tong *et al* 1992).

Okoye (1984) reported that infectious bursal disease is widespread in Nigeria and leads to high mortality in affected flocks. Onunkwo (1975) had also reported a mortality rate of 43.8% in chickens in Nigeria. Undocumented field reports gave even higher mortality rates. Nwaogu (personal communication) has observed a 93.4% morbidity and 100% mortality rates in a broiler flock accidentally given overdose of gumboro vaccine. In this experiment, the 14% morbidity rate recorded in group "A" is much lower than common field experience and also significantly lower than the 60% morbidity rate got in group "B" ($P < 0.01$). This suggests that ADMACINE SOLUBLE POWDER (R) (SAL VETERINARY SERVICES NIG. LIMITED) is effective in reducing clinical manifestation of gumboro in infected chicks. This could result from the antibiotic effect on the secondary bacterial infection in the immune-suppressed chicks thus allowing the immune system of the chicks time to overcome the infection.

In group "X" mortality rate was 94% but in groups "Y" and "Z" where the birds were treated with the drug, mortality rates were 15% and 47% respectively.

This 15% mortality rate got in group "Y" was lower than the 43.8% mortality rate reported by Onunkwo (1975) and significantly lower than the 94% mortality rate got in group "X" ($P < 0.01$). This also shows that the drug is effective in managing even clinically sick chicks. Infectious bursal disease manifests with diarrhoea among other clinical sign (Siegmund, 1979). Diarrhoe is a major cause of death in any disease where it occurs. In effect, the drug not only suppresses secondary bacterial infections, it also stops diarrhoea. This may be responsible for the reduced mortality rate recorded among treated chicks.

The 47% mortality rate recorded in group "Z" was significantly higher than the 15% got in group "Y" ($P < 0.01$). This suggests that separation of sick chicks from healthy ones during treatment gives higher chances of recovery. The sick chicks in group "Z" may have been unable to struggle with the healthy ones for the medicated water and so may not have got the required doses of the drug. Death in this group could also have resulted from direct trampling of the sick chicks by the healthy ones.

It is suggested that in outbreaks of gumboro, sick chicks should be separated from apparently healthy ones. Both the clinically sick birds and the incontact chicks should be treated with appropriate antibiotic-antidiarrhoeic drug preparations.

REFERENCES

ABDU, P.A. (1986). An outbreak of gumboro disease in vaccinated flock in Zaria. Zariya Vet. (1) 1: 40-47.

BISHOP, O.N. (1974). Statistics for Biology. 2nd Edit. Longman group Ltd. London: 72-79

EZEIBE, M.C.O. (1994). Clinical and virus excretion studies on field outbreaks of PPR. M.Sc disertation University of Nig. Nsukka. pp: 14-18.

FRASER, C.M. (1991). The Merck Vet. Manual 7th Edit. Merck and Co Inc. Rahway, N.J., U.S.A.: 1577-1578.

OKOYE, J.O.A. (1984). Infectious bursal disease of chickens. Bull. Anim. Hlth. Afri. 32 (2): 193

OKOYE, J.O.A. IGUMU, E.P. and NWOSUH, C. (1990). Pathogenicity of an isolate of infectious bursal disease virus in local Nigerian ducks. Trop. Anim. Hlth. prod. (22): 160-162.

OKOYE, J.O.A., ORAJAKA, L.J.E and NWOSUH, C.J. (1992). Antibody response of local and exotic Nigerian chickens to infectious bursal disease virus. Proc. 29th Annual general meeting of Nig. Vet. Med.

Assoc. 56-58.ONUNKWO, O. (1975). An outbreak of infectious bursal disease (IBD) of chickens in Nigeria. Vet. Rec. 97:433.

ONIFADE, A.A. (1995). Growth performance, organ measurements and haematology of broiler chickens fed a high fibre diet supplemented with antibiotics or dried yeast. Nutr. Biochem. (In Press).

ONWUDIKE, O.C. (1986). Palm kernel meal as a feed for poultry: 1. Composition of palm kernel meal and availability of its amino acids to chicks. Anim. Feed Sci. Technol. 16: 179 - 186.

PANIGRAHI, S. and POWELL, C.J. (1991). Effects of high rates of inclusion of palm kernel meal in broiler chick diets. Anim. Feed Sci. Technol. 16: 179 - 186.

PANIGRAHI, S. and POWELL, C.J. (1991). Effects of high rates of inclusion of palm kernel meal in broiler chick diets. Anim. Feed Sci. Technol. 34: 37 - 47

POND, W.G. (1989). Plant fibre utilization by pigs Comm. Agric. Bureau 10: 13 - 15.

POND, W.G.; VAREL, V.H.; DICKSON, J.S. and ITASCHECK, V.M. (1989). Comparative response of swine and rats to high fibre or high protien diets. J. Anim. Sci. 67: 716 - 723.

SAVORY, C.J. and GENTLE, M.J. (1976). Chnages in food intake and gut size in Japanese quail in response to manipulation of dietary fibre content. Br. Poultry. Sci. 17: 561 - 570.

SOBAMIWA, O and LONGE, O.G. (1994). Utilization of cocoapod pericarp fractions in broiler chick diets. Anim. Feed Sci. technol. 47: 237 - 244.

STEEL, R.G.D. and TORRIE, J.H. (1980). Principles and procedures of statistics. A biometrical approach. 2nd edn. McGraw-Hill Book Company.

SUMMERS, J.O. and LEESON, S. (1986). Influence of nutrient on feed consumption, weight gain and gut capacity of broilers, leghorns and turkeys reared to 26 days of age. Anim. Feed. Sci. technol. 16: 129 - 141.

PERELMAN, B. and HELLER, E.D. (1981). Refuah veterinarith, 38: 12-16.

SIEGMUND, O.H. (1976). The Merk vet. manual 5th edit. Merck and Co. inc. Rahway, N.J. U.S.A. 1120-1103.

TONG, J.C., UMOH, J.U. ABDU, P.A. AND SAIDU, L. (1992). Retrospective studies of gumboro disease seen in Ahmadu Bello University Veterinary teaching hospital. Proc. 29th Annual general meeting of Nig. Vet. Med. Assoc. Kaduna: 117-723.

WEISMAN, J. and HITCHNER, S.B. (1978) Avian disease, 22: 604-609.