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Full Length Research Paper

The effects of vaccination, antibiotic and vitamin therapy on some clinical parameters associated with natural outbreak of fowlpox in chickens

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The management of field outbreak of fowlpox in chickens was studied in a batch of 1050, five weeks old white cockerels. Post infection or emergency vaccination and the oral administration of antibiotics, and vitamins were investigated on how they can reduce the clinical parameter associated with fowl pox infections in chickens. Natural outbreak of fowlpox was observed in the birds at the age of five weeks and clinical signs of nodules and papules on the head and comb and the production of pocks on the chorio allantoic membranes (CAM) of embryonated chicken eggs was used to diagnose the infection. On observing the clinical signs, the birds were immediately divided into four groups. Group 1 received fowlpox vaccine only. Group 2 received the vaccine and Neoceryl® plus, a combination of antibiotics and vitamins. Group 3 received Neoceryl® plus only, while Group 4 did not receive any treatment. Birds in all the groups were monitored for the progress of the disease up to five weeks. Best results were obtained with birds in Group 2. This was closely followed by those in Group 1. Worst results were shown by birds in Group 4 and this was followed by those in Group 3. The result shows that post infection vaccination is good in the control of fowlpox in chickens especially when it is noticed early and a small percentage of the flock is infected. Controlling secondary bacterial infection and boosting immune responses with Neoceryl® plus played a good role.

Key words: Post infection vaccination, antibiotic/vitamin supplementation, natural fowlpox.

INTRODUCTION

Fowlpox is a viral disease of chickens caused by an avipox virus which belong to the family *Poxviridae* (Tripathy and Reed, 2003). Chickens of all ages are susceptible to it (Mockett, 1996). It is characterized by the development of discrete nodular proliferative lesions on the combs, wattles, eyelids, legs and mucous membranes of the mouth, upper respiratory and digestive tracts (Mockett, 1996; Hsieh et al, 2005). Disease occurs in two forms; as a mild cutaneous dry form with low mortality and lesion being shown on the combs and wattles, as a wet diphtheritic form which is more severe with the involvement of the mucous membranes of the digestive tract or as both forms (Minbay and Kreier, 1973).

Diagnosis of fowlpox is straight forward and can be made on the basis of clinical signs and lesions (Mockett 1996; Silva et al., 2009). Definitive diagnosis can be by isolation or growth in chorioallantoic membrane (CAM) with the development of pock lesion on the membrane or by agar gel precipitin test (AGPT) (Andrews et al., 1978). Like many other viral diseases, there is no specific treatment for birds infected with avian poxviruses (Tripathy and Reed, 2003). Field outbreaks of fowlpox in chickens have been managed by the removal of the nodular lesion and application of antiseptics, oral administration of antibiotics, oral administration of antibiotics and vitamins, proper husbandry practices to alleviate stress and post infection or emergency vaccination (Baxandale, 1981; Tripathy and Reed, 2003). These have yielded varying effects. This work investigated the management of a field or natural outbreak of fowlpox in chickens by emergency

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Table 1. Morbidity, mortality and weight gain in chickens as assessed in the four groups.

Group	Morbidity (%)	Mortality (%)	Weight gain (g)
1	40	10	775±2.89[a]
2	40	8	800±11.54[a]
3	64	20	625±14.43[b]
4	88	37	570±11.54[c]

a, b, c, d, e Means in the same column not sharing a common superscript are significantly different (P<0.05).

or post infection vaccination, antibiotics and vitamin administration and a combination of both.

MATERIALS AND METHODS

Field outbreak

An outbreak of infection in a batch of 1050, 5-weeks old white cockerels were reported in a farm located at Nsukka, Southeast Nigeria. On examination of the birds in the flock, nodules and papules were found on the heads and wattles of a few birds. On sampling, 5.2% of the birds were found to have lesions. The condition was suspected to be fowlpox. Scrapings from the head lesions were collected in a stabilizing solution, ground-up and inoculated into 10 day-old embryonated chicken eggs through the chorioallantoic route and definitive diagnosis was made later by the growth and production of pocks on CAM.

Group treatment

On the day of examination, the birds were randomly divided into four groups of 262 birds each. Feed and water were given to the birds *ad libitum*. Birds in Group 1 were vaccinated each with a single dose of fowlpox vaccine obtained from the National Veterinary Research Institute (NVRI), Vom, Nigeria by stab puncture in the wing web using a bifurcated needle each with a groove that holds the vaccinal fluid. Birds in Group 2 were vaccinated with a single dose of the same vaccine using the same method as in Group 1. Moreover, they were given Neoceryl® plus (Animal Care Services Konsult (Nig) Ltd.) in the drinking water. Neoceryl® plus is a combination of antibiotics, erythromycin ethiocyanate, oxytetracycline HCl, streptomycin sulphate, neomycin sulphate, colistine sulphate and vitamin C which is an antistress vitamin, contained in high level (200 mg/100 g). Birds in Group 3 were given only Neoceryl® plus in water and were not vaccinated. Birds in Group 4 were neither vaccinated nor given Neoceryl® plus. Table 1 summarizes the treatment in the groups.

The progress of the disease in the four groups was monitored up to five weeks post treatment and recorded. Some clinical parameters such as percentage morbidity, percentage mortality and performance of the birds were assessed quantitatively for the five weeks period. Percentage morbidity was assessed by noting the average number of birds that had lesions on the combs and wattles and on a weekly basis for the study period and this was expressed as percentage.

Percentage mortality was assessed by noting the total number of birds that died within the study period and this was also expressed as percentage. Performance of the birds was assessed by noting the average weight gain of the birds within the study period. Post mortem examination was carried out on the dead birds.

RESULTS AND DISCUSSION

The clinical parameters monitored showed reduction in feed and water consumption in all the groups. This was more pronounced in Group 4. Some birds in all the groups showed soiled vent which was indicative of diarrhea. The percentage morbidity of the birds was 40%, 40%, 64% and 88% in groups 1 to 4 respectively, while percentage mortality was 10%, 8%, 20%, 37% in groups 1 -4 respectively. Performance of the birds as measured by average weight gain was 775±2.89g, 800±11.54g, 625±14.43g, and 570±11.54g as shown in Table 1. However, there was no significance difference (P>0.05) in the final body weights between the vaccinated and not treated group 1 and the vaccinated and treated group 2; which were signifantly higher (P<0.05) than the unvaccinated treated group 3 and unvaccinated and untreated group 4. Post mortem examination of carcasses from all the groups showed similar lesions of nodules on the combs and wattles, ulcerative whitish areas in the mouth and upper digestive tract. Some of the birds that died had no lesion on the head and wattle but had lesions in the oral and upper respiratory regions.

Post infection or emergency vaccination of chickens against some avian pathogens is commonly practiced in many developing countries of Africa and Asia. In our opinion, this have yielded differing results and this may be due to certain conditions such as climate or weather conditions; age, breed and sex of the birds; severity of infection at the time of emergency vaccination; level of immunity of the birds before infection; number of animals infected before emergency vaccination; and type or nature of vaccine used for the emergency vaccination, the nature or virulence of the pathogen itself. Okoye et al. (2007) studied post infection vaccination of chickens against velogenic Newcastle disease (ND) and their results did not encourage post infection vaccination of flocks in situations where most of the birds have started showing clinical signs of the disease. They were of the opinion that this can apply to vaccinated flocks where only few of the birds have started showing clinical signs of ND as revaccinations of the flock can boost immunity in those birds that have insufficient antibody against infection. Post exposure vaccinations or treatments have been successful in preventing or modifying some other

viral diseases in man and animals. Drew (2004) and Johnson et al. (2010) reported treatment after exposure to rabies virus in humans, also known as post-exposure prophylaxis (PEP) as a highly successful method of preventing rabies in exposed individuals provided it is administered promptly within ten days of infection. Feldmann et al. (2009) achieved remarkable success in the treatment of rodents and non human primates experimentally infected with Ebola virus. He suggested that this may be the most effective post-exposure treatment strategy for Ebola infections because of its suitability for use in accidentally exposed individual and in the control of secondary transmission during natural occurring or deliberate release. Geisber et al. (2010) demonstrated successful post-exposure treatment of monkeys infected experimentally with Marburg virus. Other viral infections where post-exposure of prophylaxes have been applied are hepatitis B (Yu et al., 2004) and small pox (Massoudi et al., 2003).

The result of this experiment showed that emergency post-exposure vaccination can be used to manage outbreaks of fowlpox in chickens. These findings as seen in fowlpox infection did not agree with the laboratory findings of the above authors in ND infections. However, it agrees with their recommendations that good results could be obtained when most of the birds have not been infected as only 5.2% of the birds were affected prior to emergency vaccination. But it is important to note that these birds were not vaccinated before the outbreak and antibodies circulating in them can only be maternal antibodies which may have declined appreciably at the time of infection. One can then say that since fowlpox is a slow spreading infection, there will be time to allow for the development of immunity in those that were not affected and boosting of immunity in those that have been affected. The work also agrees with the report of Mockett (1996) who reported that removal or culling of the first few affected birds and emergency vaccination have been used to control fowlpox infections in endemic areas.

The concomitant administration of antibiotics and vitamins in Neoceryl® plus with emergency vaccination gave a slightly improved result. Survashe (1996) reported the successful use of antibiotics to control secondary bacterial complications in viral infections. Ascorbic acid has been shown to enhance or boost immune responses and alleviate stress in chickens (McCorkle et al., 1980; Gross, 1988). The antibiotics and ascorbic acid contained in Neoceryl® plus may have complemented the effect of emergency vaccinations by control of secondary bacterial complications and boosting the immune responses of the birds. Those in Group 3 that were treated with only Neoceryl® plus showed better result than those that hand no treatment with either emergency vaccination nor Neoceryl® plus (Group 4). This showed that the antibiotics and vitamins were able to reduce the mortalities due to fowlpox infection.

The presence of soiled vent was indicative of intestinal involvement with diarrhoea. It is important to note that many of the birds died without lesions on their heads but with diphtheritic lesion in the oral cavity and upper digestive tract. The clinical sign and post mortem findings showed that the outbreak was a combination of a wet and dry pox. This was also supported by the high mortality and morbidity as was seen in Group 4.

Conclusion

The investigations above have shown that post-exposure or post-infection vaccination can be used in the management of an outbreak of fowlpox in chickens. The concomitant administration of drugs containing antibiotics and vitamins will also be helpful. This emergency vaccination should be done early in infection when most of the birds have not been infected. Culling of the infected birds may also help in controlling the infection as this reduces the number of affected animals and prevent spread by contact.

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