



Retrospective studies on the Prevalence of Fowl Cholera in Zaria-Kaduna State Nigeria.

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Abstract

Fowl cholera is a contagious bacterial disease of domestic and wild avian species. The infection is caused by *Pasteurella multocida*. The data for this study was obtained from the Diagnostic Microbiology laboratory of the Department of Veterinary Pathology and Microbiology and Veterinary Teaching Hospital of Ahmadu Bello University, Zaria between the year 2001 and 2005. Prevalence rate of avian pasteurellosis obtained in this study were 2.3%, 6.4%, 1.5%, 4.6% and 7.4% for 2001, 2002, 2003, 2004 and 2005 respectively. The results showed that there was an increase in the prevalence of avian pasteurellosis from 2001 to 2005. There was also variation in the monthly distribution of avian pasteurellosis in Zaria, with highest number of cases in April and in August accounting for 35% and 25% respectively. In order to control the disease, further studies will be needed to detect the mode of spread and possible roles of wild birds as latent carriers of *P. multocida* and to monitor the FC outbreak in birds.

Key world: Avian, occurrence, pasteurellosis, seasonality, Zaria Nigeria

Introduction

The poultry industry in Nigeria for the last decade offered the quickest supply of animal protein to man and provided comparatively faster returns on investment than cattle, small ruminants or pigs. Hence the increased attention being given to the health care of poultry by farmers (Jordan, 1982; Etukudo & Adegboye, 1983; Molokwu *et al.*, 1988). Fowl cholera is a contagious bacterial disease of domesticated and wild avian species caused by *Pasteurella multocida* (OIE, 2008). The disease is also known as avian cholera, avian pasteurellosis, and avian hemorrhagic septicemia. Fowl cholera (FC) has been described almost world wide and causes great losses to the poultry industry (Petersen *et al.*, 2001). *P. multocida* is a gram negative, oxidase positive, non-motile, non-spore forming facultative anaerobic rod shaped or coccoid bacterium (Petersen *et al.*, 2001). The mode of transmission can be by mechanical means through vectors, ingestion or by aerosol and virulent strains are mucoid and encapsulated (Masdooq *et al.*, 2008). Based on pathogenicity, sixteen somatic serotypes of *P. multocida* and six serotypes have been isolated, all of which can infect avian hosts (Brogden *et al.*, 1977).

Fowl cholera is predominantly a disease of chickens and turkeys, but is also a serious disease of ducks and geese (Petersen *et al.*, 2001). Many other birds including game

birds and companion birds are susceptible to infection. Rhoades & Rimler (1991) reported out breaks in birds from 6 weeks and above, however, Perelman *et al.*, (1990) and some other workers have reported out breaks as early as 4–5 weeks old birds. The clinical manifestations of avian pasteurellosis may cause high morbidity and mortality and occurs in several forms which can be per acute, acute, chronic and localized disease (Heddleston *et al.*, 1972). The per acute form, is probably the most virulent and highly infectious form where there are no pre monitoring signs, birds in good body conditions are found dead. Death may be preceded for a few hours of anorexia, high fever, mucous discharge from the beak; green foetid diarrhea and cyanosis of the comb in the acute form (Heddleston *et al.*, 1972; Einum *et al.*, 2003). In the chronic form there is sign of respiratory infection, conjunctivitis, tracheitis, lameness and dyspnoea. These may be accompanied by joint lesions and infection of the middle ear leading to torticollis (Heddleston *et al.*, 1972). This retrospective study was undertaken to determine the prevalence rate of avian pasteurellosis and monthly distribution of the disease in Zaria.

Materials and Methods

The data for this retrospective study was obtained from the Diagnostic Microbiology Laboratory of the Veterinary Teaching Hospital of Ahmadu Bello University, Samaru Zaria between the year 2001 and 2005. The result is presented yearly reflecting number of samples sent to the laboratory monthly.

Bacterial Isolation and identification

At necropsy, tissues from lung, trachea and nasal discharge were collected for bacterial isolation. Bacterial culture was done on blood agar (Oxoid, England) with 5% sheep blood and incubated aerobically at 37°C for 24 hr. *P. multocida*, was confirmed by colony morphology, gram-negative staining, bipolar: positive reactions in oxidase, indole, and mannitol; and negative reaction in urease and the *P. multocida* isolated did not grow on MacConkey agar (Madsen *et al.*, 1985). The isolates were subjected to standard biochemical tests as previously described for *P. multocida* (Madsen *et al.*, 1985).

Statistical analysis

All analyses were performed using SAS Version 8.0 or SAS PC (SAS Institute Inc., Cary, NC). The χ^2 test or Fisher exact test was used for statistical analysis of the difference in occurrence and seasonality frequencies. Significance levels of less than 5% were used.

Results

The results of avian pasteurellosis in Zaria during the years of study showed that the prevalence rate were 2.3%, 6.4%, 1.5%, 4.6% and 7.4% for 2001, 2002, 2003, 2004 and 2005 respectively (Table 1). The overall prevalence rate during the period of study from 2001 to 2005 was 4.7%. There was an increase in the prevalence rate of avian pasteurellosis from 2001 to 2005. The results obtained showed that there was no seasonal variation but more cases were reported in the months of April and August (Table 2).

Table 1. The yearly distribution of fowl cholera in Zaria 2001 -2005

| Year | No. of poultry cases | No. positive for <i>P. multocida</i> |
|-------|----------------------|--------------------------------------|
| 2001 | 87 | 2 |
| 2002 | 78 | 5 |
| 2003 | 65 | 1 |
| 2004 | 88 | 4 |
| 2005 | 107 | 8 |
| TOTAL | 425 | 20 |

Table 2. The monthly distribution of fowl cholera in Zaria

| Months | No. of poultry cases | No positive for fowl cholera (<i>P. multocida</i>) |
|-----------|----------------------|--|
| January | 29 | 1 |
| February | 15 | 0 |
| March | 41 | 1 |
| April | 31 | 7 |
| May | 34 | 1 |
| June | 38 | 1 |
| July | 38 | 1 |
| August | 74 | 5 |
| September | 53 | 1 |
| October | 23 | 2 |
| November | 18 | 0 |
| December | 31 | 0 |
| TOTAL | 425 | 20 |

Discussion

The results of avian pasteurellosis in Zaria during the years of study showed that the prevalence rate were 2.3%, 6.4%, 1.5%, 4.6% and 7.4% for 2001, 2002, 2003, 2004 and 2005 respectively. There was no significant different in the prevalence of avian pasturellosis in the yearly distribution. The overall prevalence rate during

the period of study from 2001 to 2005 was 4.7%. This is very similar to the finding of Masdoq *et al.*, (2008) who found overall prevalence of 6.4% in their study in Jos-Plateau State. In the present study, increase in the monthly distribution of avian pasturellosis were found in the months of April and August. This may be due to heavy rainfall during this period which made it possible

for the organism to survive for longer time in the environment. In Nigeria there are few documented reports of avian pasteurellosis. Molokwu *et al.*, (1990) in their study on bacteria isolated from cases of chronic respiratory diseases of chicken in Zaria area, recorded an incidence rate of 3.7% of the birds examined. Abdu (1990) reported repeated outbreaks in six different batches of layers in a back yard farm between 1982 and 1987. Odugbo *et al.* (2004) also reported an outbreak of pasteurellosis in Japanese quails with high mortalities. In a study on pathogenic bacteria associated with respiratory diseases in poultry, Masdooq *et al* (2008) reported an incidence rate of 6.4% for avian pasteurellosis in poultry lungs and heart blood sampled in Jos South Local Government area of Plateau State Nigeria. Some cases are wrongly diagnosed as fowl typhoid and avian colibacillosis because of the similarity in the clinical signs with fowl cholera. Other cases are not diagnosed because of the indiscriminate use of antibiotics by poultry farmers (Masdooq *et al.*, 2008). This means that an in-depth investigation on the level of endemicity of avian pasteurellosis is required to ascertain its level in Nigeria in order to curtail the spread. This can be achieved by embarking on a nationwide vaccination campaign. The zoonotic importance of the disease cannot be

overemphasized. Yasutomo & Kazanuri (2005) reported incidences of pasteurellosis in a man keeping cattle. Their report in 1991 after conducting a survey of respiratory infection in man, showed that over 50% of respiratory cases were caused by *Pasteurella multocida* and 21% incidence of pasteurellosis was due to bites or scratches from dogs and cats. Their findings is important for poultry attendants with respiratory problems. They should be examined and treated to avoid the spread of opportunistic microorganisms to poultry and vice visa. This study recommends that a national surveillance be conducted to ascertain the level of endemicity of fowl cholera in Nigeria. Indiscriminate use of antimicrobials by farmers should be discouraged. Prescriptions and medications should be done strictly by the Veterinarian. It is important for poultry attendants with respiratory problems to stay at home to avoid infecting birds on the farms.

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