Tetrameres Infection in local poultry in Katsina State, Nigeria

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Abstract

We report an outbreak of Tetrameres americana in a semi intensive flock of local poultry in Katsina State, Nigeria causing mortality of 40% in chicken and 57% in turkeys, approaching Newcastle Disease and Avian influenza in mortality. Presence of reddish spots on the serosa of proventriculus was initially mistaken for pin-point haemorrhages, thus a presumptive diagnosis of Newcastle disease. However, on gross pathological examination, the reddish spots were identified as gravid females of *Tetrameres americana* embedded in the serosal surface of the proventriculus of the chicken and turkeys. Tissue homogenates from dead birds were negative for Newcastle disease and Avian influenza viruses by rapid antigen detection and isolation in hen's embryonated eggs. Recently, we had reported infection due to *Tetrameres fissispina* in local poultry population in Taraba State, Nigeria causing high mortality at the time Avian influenza outbreaks were initially confirmed in both local and commercial poultry flocks in Nigeria. It is thus important to investigate the epidemiology of this parasite and its contribution to mortality and economic losses in poultry industry in Nigeria.

Key words: *Tetrameres americana*, Mortality, Local poultry, Katsina, Nigeria, Avian Influenza.

Introduction

Poultry outnumbers all other forms of livestock in Nigeria, and, not surprisingly, are found throughout the country, wherever there is human settlement. Chickens are by far the most common, others are pigeons, ducks and Guinea fowl, and some turkeys, are also kept (Akinwumi et al., 1979, Adene and Oguntade, 2006) .They are maintained under traditional, low input, free-range systems of management, however, substantial numbers are also reared intensively on a commercial basis. The total estimated population of chickens in Nigeria is 82.4 million (RIM, 1992, Adene and Oguntade, 2006). The rural poultry population in most African countries accounts for more than 60 percent of the total national poultry population, which has been accorded an asset value of US$5 750 million at 1990 naira exchange rate (Sonaiya, 1990a).

The major constraint on traditional chicken production is disease, such as Newcastle disease, which particularly affects local breeds during particular seasons of the year (Anjum et al, 1993, Lambert and Kabar, 1994, Saidu et.al, 2006). By their mode of life on free range, and scavenging habits, traditional village poultry are in permanent contact with other flocks, soil and insects which can act as reservoirs or vectors for a range of bacterial and helmintic diseases(Permin et.al.,1997). A study on the incidence of worms in chicken farms in Nigeria found that the most common species were Ascaridia galli, Prosthogonium spp., Strongyloids avium and Heterakis gallinarum (Tona, 1995). Raillietina spp and Davainea progglottina occurred only in free-range chickens. Tetrameres spp infestation was listed as one of helminths encountered in local poultry in Nigeria (Fatumbi and Adene, 1979, Adene, 2008). Kamani et al., (2008) reported Tetrameres fissispina infestation as being responsible for mortalities in local chicken flocks in Taraba State. Although, Fatumbi and Adene, (1979), reported the occurrence and pathogenicity of Tetrameres sp. in guinea fowls and chicken in Nigeria, there has been little documentation in relation to the epidemiology, pathogenicity and economic importance of this parasite in the Nigerian poultry industry. This paper reports a case of Tetrameres americana infestation in a flock of local poultry causing mortalities of local birds in another agro-ecological region of Nigeria, thus emphasizing the increasing importance of this parasite in rural flock health and productivity.

Flock History : Affected farm has a back yard semi-

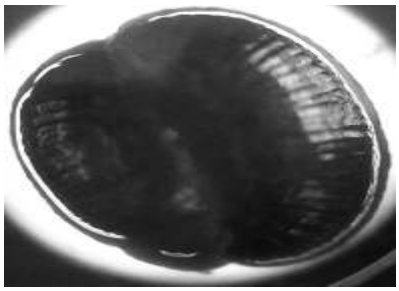

Fig 1. Tetrameres americana (gravid female) X 4

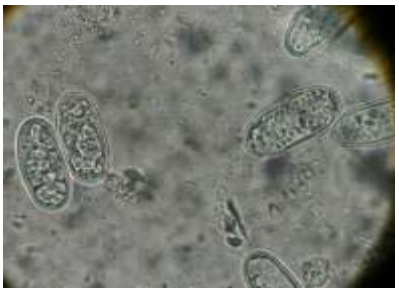

Fig 3. Embyonated eggs(arrows) of *Tetramere americana* X40

intensive flock with 37 local poultry (10 chickens, 7 turkeys, 20 guinea fowls). They were fed on wheat bran as a supplement to free range scavenging. Mortalities recorded within a week of disease onset were; 4 chickens, 1 adult turkey and 3 turkey poults. There was neither mortality nor sign of disease among guinea fowls and geese on the farm. Clinical signs observed in affected chickens and turkeys were; respiratory distress, greenish diarrhea, ruffled feathers, torticolis, nasal discharges, anorexia and bilateral paralysis of wing or legs.

Post mortem lesions seen were; pin- head size subserosal hemorrhages on the proventriculus as well as hemorrhages of the trachea and small intestine. We made a small cut on the serosa using sterile scalpel blade and gently applied pressure on the proventiculus to extrude the red mass in the subserosa. The red mass was identified by microscopy in the Parasitology Division NVRI, Vom as female Tetrameres americana.

Management

Sick birds were isolated from apparently healthy birds followed by administration of 0.3ml of oxyteracycline Long Acting intramuscularly to each affected bird. Tylosin (Tylodos®) and albendazole suspension were administered through drinking water to all the birds according to manufacturer's recommendation. Apparently healthy birds (guinea fowls and geese) were vaccinated against ND using (Lasota) vaccine. The farmer was advised to separate the guinea fowls and geese from the affected poultry species. The treated birds responded to treatment after 48 hours of treatment.

Discussion

The importance of rural poultry in national economies of developing countries and its role in improving the nutritional status and incomes of many small farmers and landless peasants has been recognized by various scholars and rural development agencies (FAO, 1982, Creevey, 1991). Rural poultry is also an important element in diversifying agricultural production and increasing household food security. The village chickens provide readily harvestable animal protein to rural households, and in some parts of Africa they are also raised to meet the obligation of hospitality to honored guests. Unfortunately flock diseases have been the bane of profitable poultry production, particularly in rural areas with little or no access to effective drugs and vaccines. Newcastle Disease (ND) is by far the most predominant infection in both commercial and local chickens in Nigeria (Adene, 1996, Saidu et al, 2006). But between 2006 and 2007, Avian influenza ravaged the poultry sector and would have caused a permanent decimation, but for the quick intervention of Government and its agencies (Joannis et al.,2008). Surveillance for diseases was intensified in the course of the oubreak and many diseases which were hitherto unreported were recorded. Some of these infections are often misdiagnosed as in this case wherein proventricular protusion of engorged adult Tetrameres in the serosa were taken for haemorrages. In earlier report by Kamani et al ,(2008) , mortalities in local flock were attributed to prevaling Avian influenza . However in the absense of confirmatory diagnosis for Avian influenza and Newcastle diseases, attention was shifted to other poultry infections. Gross pathological examination showed presence of Tetrameres in cases in Taraba State. In the current report from Katsina State, Nigeria, Tetrameres infection was also confirmed by gross and parasitological examination using the morphology and size of the worm according to Soulsby, (1986). Agents of other infections such as Avian influenza and Newcastle disease considered most probable cause of flock mortality were not detectable. *Tetrameres americana* embeded in the proventricular serosa is thus the most likely cause of death in the flock. Fink et al, (2005) reported a prevalence of 97% of *T.americana* in local chicks in Tanzania which constitutes a significant health hazard to the poultry population. Given the scavenging habit of local birds, Tetrameres must have been acquired through feeding on the intermediate hosts; grasshoppers or cockroaches picked from the ground where adult worms will develop

in the proventriculus. The adult worm feed on the blood of the host and becomes engorged and gravid. This feeding habit could lead to severe anemia and death in the infested bird in diagnosis and treatment is not instituted promptly. It is therefore needful to conduct further epidemiological and pathological studies on Tetrameres species to establish the pathogenicity and economic importance of the infection in Nigeria.

References

1. Adene D.F (2008): Poultry Health and Production: Principles and Practise Stirling-Horden Publishers Ltd Nigeria. Chapter 9; Diseases of poultry with principles in handling and application of vaccine.pp 91-103.
2. Adene and Oguntade (2006): The Structure and Importance of the Commercial and Village Based Poultry Industry in Nigeria. Poultry Production Systems. FAO: Rome Study.pp
3. Adene, D.F. (1996): International poultry health problems: Perspective from the poultry industry in Africa. In Proceedings, 20th World Poultry Congress, New Delhi, India, 1–5 September 1996, Vol. 2, p. 401–414.
4. Akinwunmi, J.A, et.al.(1979): Economic analysis of the Nigerian poultry industry, Federal Livestock Department, Lagos.
5. Anjum, A. D., S. Hassan, and G.S. Arbi.,(1993): Infectious bursal disease in chickens in Pakistan. *Pak. Vet. J.* 13(2):54-58.
6. Creevey, L.E. (1991): Supporting small-scale enterprise for women farmers in the Sahel. *Journal of International Development*, 3(4): 355–386.
7. FAO. (1982). Report on the expert consultation on rural poultry and rabbit production. Animal Production and Health Division Publ. No. 226521. Rome.
8. Fatunmbi, O.O and Adene, DF., (1979): Occurrence and pathogenicity of tetrameriasis in guinea fowl and chickens in Nigeria. *Vet Rec.* 105: 330.
9. Fink, M., Permin, A., Magwisha, H.B., Jensen, K.M.V.(2005): Prevalence of proventriculat nematodes, Tetrameres americana Cram(1927) in different age groups of chicken in the Morogoro region, Tanzania. *Trop.Anim. Hlth and Prod*.37(2),133-137.
10. Joannis, T. M., et.al.(2008): Serologic and virologic surveillance of avian influenza in Nigeria, 2006-7. *Eurosurveill*. 13,pp II=19007.
11. Lambert, C. and A. C. Kabar., (1994): Egg drop syndrome (EDS 76) in New Caledonia, first diagnosis and control. *Revue d" Elevage-et-de-Medecine Veterinaire-de-Nouvelle Caledonie.* 14(7): 12.
12. Kamani J., Meseko C.A., Tanko T.J., Tafarki A.E., Lazarus D.D., Peter J.G., and Oladokun A.T. (2008):Tetrameres fissispina infection in local chickens in Taraba State Nigeria, case report. *International Journal of Poultry Science* 7(12):1216-1218.
13. Permin, A., Magwisha, H.B., Kassuku, A.A., Nansen, P., Bisgaard,M., Frandsen, F and Gibbons, L.(1997): A cross sectional study of helminths in rural scavenging poultry in Tanzania in relation to season and climate. *Journal of Helminthology*, 71, 233-240.
14. Sa'idu, L., Abdu, P.A., Tekdek, L.B. and Umoh, J.U (2006): Retrospective study of Newcastle Disease cases in Zaria, Nigeria. *Nig. Vet. Jour.* 27, 53-62.
15. Sonaiya, E.B.(1990a): The context and prospects for development of smallholder rural poultry production in Africa. In Proceedings, CTA Seminar on Smallholder Rural Poultry Production, Thessaloniki, Greece, 9–13 October 1990, Vol. 1, p. 35–52.
16. Tona, G.O. (1995): Incidence of worms in chickens on farms in Ikorodu Local Government Area of Lagos State, Nigeria. *African Network of Rural Poultry Development Newsletter*, 5(1).

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