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Serological Evidence of Brucellosis in Local Chickens in Kaduna State, Nigeria

[1]Victor Tita Gugong, [2]Nanven Abraham Maurice, [3]Emmanuel Ochefije Ngbede,
[4]Sunday Emmanuel Hambolu and [4]Ikwe Ajogi
[1]Nuhu Bamali Polytechnic, School of Agricultural Technology,
Samaru-Kataf, Kaduna State, Nigeria
[2]National Veterinary Research Institute (NVRI), South-South Zonal Laboratory Calabar,
Cross River State, Nigeria
[3]Department of Veterinary Pathology and Microbiology,
[4]Department of Veterinary Public Health and Preventive Medicine,
Ahmadu Bello University, Zaria, Nigeria

Abstract: A study to assess the status of brucellosis in local chickens was conducted in four Local Government Areas (LGAs) of Kaduna state, Nigeria. A total of 150 sera sample were collected between December, 2010 and March, 2011 from local chickens in the LGAs. Only 1 (0.67%) out of the 150 sera samples obtained was positive for brucella antibodies with the Rose Bengal Plate Test (RBPT). Brucellosis is present in local chickens and they may serve as source of infection to other livestock and humans. Enlightenment campaigns on good hygienic practices, the use of protective clothing when coming in contact with poultry or their products and proper disposal of aborted foetuses, placenta and contaminated materials needs to be carried out. There is need to control brucellosis in cattle, sheep and goats which may be sources of the brucella organism to chickens.

Key words: Brucellosis, chicken, antibodies, Rose Bengal Plate test, infection, Nigeria

INTRODUCTION

Zoonosis causes great economic losses especially to people in rural areas of sub-Saharan African countries (Perry *et al*., 2001). Brucellosis is a zoonosis of veterinary, public health and economic significance (John *et al*., 2010). The disease has been reported to be endemic in Nigeria (Ajogi, 1997). It has been documented in cattle (Bale and Kumi-Diaka, 1981; Ajogi, 1997) sheep and goats (Ocholi *et al*., 2005; Abubakar and Nawani, 2010; Bertu *et al*., 2010), horses (Bale and Kwanashie, 1984; Ocholi *et al*., 2004) camels (Kudi *et al*., 1997a), pigs (Onunkwo *et al*., 2011) and in chickens (Bale and Nuru, 1982; Abdu *et al*., 1984; Junaidu *et al*., 2006; Kudi *et al*., 1997b).

Humans get infected by consuming animal products contaminated by the organism and direct contact of a bruised skin of people handling brucella infected products, unhygienic attitude of animal handlers also lead to spread of the disease (Ajogi *et al*., 2002). Although, brucellosis is a notifiable disease in Nigeria, the incidence, prevalence and distribution of the disease are difficult to determine as the system of disease surveillance and reporting is fragmentary and inefficient (Ocholi *et al*., 1993).

Chickens are kept in most parts of Nigeria due to their nutritional and economic important (Junaidu *et al*., 2006; Baba *et al*., 1998). The local (village) chickens provides an important source of animal protein as well as income in the rural socio-economy with little or no capital investment (Baba *et al*., 1998).

Chickens have been reported to be susceptible to brucella infection (Abdallah *et al*., 1984). The organism has been reported to cause a decrease in egg production in infected hens with the recovery of brucella from the egg shell, egg yolk and white droppings and internal organs of infected birds (Abdallah *et al*., 1984).

Most local chickens are on free range and a system of husbandry in which they are kept with other animals such as cattle, sheep and goats (Junaidu *et al*., 2006). This system predisposes them to infection by brucella organisms through contact with these animals, aborted or contaminated materials. This is evident from the documented case of transmission of brucella from cattle to chickens (Angus *et al*., 1971). The chickens when infected can serve as an important source for brucella organisms to man and other animals. The aim of this study is to assess the status of brucellosis in local chickens and to highlight the role of chickens in the spread of the disease.

Corresponding Author: Victor Tita Gugong, Nuhu Bamali Polytechnic, School of Agricultural Technology, Samaru-Kataf, Kaduna State, Nigeria

MATERIALS AND METHODS

The study was conducted between the months of December, 2010 and March, 2011 in Sanga, Kaura, Jema'a and Zangon Kataf Local Government Areas (LGAs) of Kaduna state, Northern Nigeria. Kaduna state is located between latitude, 8°2' and 11°32'N and longitude, 60°15' and 8°6'E. Total 150 blood samples were obtained from apparently healthy local chickens in the four LGAs stated and dispensed into sterile labelled sample bottles free of anticoagulant. The blood was allowed to clot and serum obtained after centrifuging at 3000 g for 5 min. The serum was stored at -20°C until use.

The sera were tested for presence of brucella antibodies at the National Veterinary Research Institute (NVRI), Vom, Plateau state, Nigeria, using Rose Bengal Plate Test (RBPT) as described by Alton *et al.* (1988). Briefly, 30 μL of test serum was placed on a white ceramic tile and the same volume of 30 μL of the RBPT antigen was placed beside the test serum. The two were mixed thoroughly with a sterile applicator stick and rocked gently for 4 min. The mixture was then observed for agglutination. Samples that showed distinct agglutination were recorded as positive while those with no sign of agglutination were recorded as negative. Simple percentage was used to analyze the data obtained.

RESULTS AND DISCUSSION

Total 150 local chickens were sampled for this study. Only 1 (0.67%) out of the 150 serum samples tested was positive for brucella antibodies using the RBPT (Table 1). The presence of antibodies to brucella in this study is suggestive of a natural exposure since chickens are not routinely vaccinated against brucellosis. The chickens roam freely scavenging for food and water and may come in contact with infected or contaminated materials (such as aborted foetuses, placenta) which they peck on and thus may become infected. Though the prevalence of antibodies in this study is low, the result should not be ignored in view of the economic and public health importance of this disease. Infected chickens can serve as reservoir of brucella organism for onward transmission to other animals and man. This result is in agreement with the studying of several researchers in Nigeria who reported that antibodies to brucella organisms are found in local chickens though the prevalence obtained in this study is lower than those obtained by these researchers (Junaidu *et al.*, 2006; Adesiyun and Abdu, 1984; Chukwu and Boniface, 1988; Kudi *et al.*, 1997a, b) and the research of Samakabadi *et al.* (2008) in Botswana. The presence of brucella reactors in local chickens on free range is of great importance in the local communities where at times cooking and watering utensils are shared between animals and man (Juniadu *et al.*, 2006). Infected chickens have been reported to shed the organism in their droppings (Samakabadi *et al.*, 2008; Abdallah *et al.*, 1984). When utensils smeared with leftover food are littered around the house, the chickens have access and in the process may contaminate these utensils with their droppings.

Table 1: LGAs, number tested and reactors to brucella agglutination using RBPT

LGAs	No. of tested	RBPT reactors (Positives)
Sanga	30	0
Kaura	40	1 (2.5%)
Zangon Kataf	40	0
Jema'a	40	0
Total	150	1 (0.67%)

LGA = Local Government Areas; RBPT = Rose Bengal Plate Test

This may be a potential source of infection for the household if the utensils are not properly washed. The droppings also pose a risk for humans especially as chicken faeces is commonly gathered for use as manure and the organism may be inhaled in form of aerosol or dust during the process.

Eggs contaminated with faeces containing the organism also pose a significant risk, especially when good hygienic practices like washing of the hands after coming in contact with chickens or their products is not strictly adhered to. Infected chickens can be a source of infection for members of the household during slaughtering or processing of such chickens as neither protective clothing nor precautions are taken when these chickens are handled.

CONCLUSION

In this study, antibodies to brucella were demonstrated in the local chickens indicating there is avian brucellosis in these localities. This highlights the possibility of birds serving as source of infection for other animals and humans. The scavenging characteristic of these chickens can allows infected ones to disseminate the organism over long distances.

RECOMMENDATIONS

It is recommended that the public, especially poultry owners and handlers be enlightened on the possibility of and danger of contracting Brucellosis from chickens and ways of preventing infections such as practicing good hygiene, the use of protective clothing when coming in contact with birds or their products and discourage the

rearing of chickens together with other animal like cattle, sheep and goats in view of the possibility of intraspecies transmission.

The possibility of chickens been infected with brucella when they come in contact with infected materials highlights the need in infected herd for the collection and burial of all aborted foetuses, placenta and discharges.

IMPLEMENTATIONS

There is an urgent need to implement adequate control and eradication policies to stop the spread of brucellosis in cattle, sheep and goats. Since, they may be the major source of brucella organisms for the chickens.

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