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Brucellosis outbreak in a flock of seventeen sheep in Zaria

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Abstract

This work is a case report of brucellosis in a flock of sheep in Zaria. The flock comprised of seventeen Yankasa sheep, 14 ewes and 3 rams, with history of 2 recent cases of abortion, a presented case of uterine prolapse and 3 cases of carpal hygroma (1st and 2nd sheep bilaterally and the 3rd sheep left unilaterally). Laboratory experiment was carried out using bacteriological and serological test using blood, vaginal swab and hygromal fluid samples collected aseptically from the flock. No growth on culture, but 13 of 17 (76%) sera samples from the flock were positive by Rose Bengal Plate Test (RBPT) and Serum Agglutination Test (SAT).

The prevalence rate of ratio 1(0.8%) male (ram) to 12(69.2%) female (ewe) was significant ($p<0.05$) and the overall prevalence rate of 76% was considered to be an outbreak of brucellosis in the flock. This findings has both economic and public health significance.

Key words: Sheep, Brucellosis, Zoonoses, Rose Bengal Plate Test, Serum Agglutination Test.

Introduction

Brucellosis is a worldwide zoonotic disease that is recognized as a major cause of heavy economic losses to the livestock industry and also poses serious human health hazards (WHO, 1986; Hamidy and Amin, 2002). Like other nations of the world, Nigeria is faced with a lot of constraints against effective livestock production and utilization. These include inadequate feed supply, poor genetic make-up, management problems and endemic diseases (Anon., 1989). Of all reproductive diseases of livestock, not only in Nigeria but all over the world, brucellosis is of major significance (Eze, 1977). This is because it causes considerable losses through abortion, infertility, neonatal death, reduced milk yield, dystocia and uterine prolapse (Ocholi, 1990). It is also of public health importance (Falade and Shonekan, 1982). Brucellosis in small ruminants (sheep and goats) has been reported in northern Nigeria (Bale *et al.*, 2003). According to these authors, cattle and goats with hygroma were not uncommon among brucellosis serologically positive flocks. Prevalence rates vary throughout and even within the same geographical zones operating different husbandry techniques (Eze, 1977; Eze, 1978; Eze, 1982 and Bale *et al*., 2003). Recent studies suggest increasing trend in the prevalence of the disease (Ocholi *et al.*, 2004). At present there is no official programme for the control of brucellosis in Nigeria (Ocholi *et al.*, 2005).

Materials and Methods

Case History

A Yankasa ewe aged about 3 years old and weighing 38 kilograms was presented to the Large Animal Unit of the Veterinary Teaching Hospital, Ahmadu Bello University, Zaria (11010´ N, 07038´ E), located in the Northern Guinea Savannah zone of Nigeria, with a prolapsed uterus. The ewe was reported to have lambed one day prior to presentation. The ewe was from a semi-intensively managed flock of seventeen Yankasa sheep. The farmer further complained that three of his sheep have swollen joints.

Physical Examination and Management of the Prolapsed Uterus

The vital parameters of the ewe were temperature 37.2oC, pulse rate 77 beats per minute and respiratory rate 34 cycles per minute. In addition to the prolapse, the ewe was straining and pieces of straw and sand had stained the prolapsed uterus. The prolapsed uterus was washed thoroughly with mild soapy water containing chlorhexidine and was examined carefully. It was devoid of lacerations and other uterine pathologies. The prolapsed uterus was massaged with sugar granules to reduce the edema and was replaced routinely back into the abdominal cavity. Purse string retention suture pattern was used to retain the uterus in the ewe's pelvic cavity. Systemic antibiotic, tetracycline long acting, at the dose rate of 20mg/kg body weight was prophylactically administered intramuscularly. The straining stopped after two hours.

Follow-up Serological and Bacteriological survey of the flock.

Farm visit and careful examination of the flock was carried out as a follow-up of a presented case of uterine prolapse to the Ahmadu Bello University Veterinary Teaching Hospital, Zaria. Follow-up Serological and Bacteriological survey of the flock was conducted to screen the flock of sheep for Brucellosis following the anamnesis of joint swellings observed in three sheep. The flock of seventeen sheep examined in this investigation belongs to a farmer at Hayin-Dogo area, Samaru village, Zaria. There had been history of occurrences of abortion in the flock of sheep. There were clinical findings of muco-purulent blood stained discharges from the vagina of two ewes in the flock during the farm visit. Three cases of carpal hygroma (two bilateral and one unilateral) were observed in three sheep which were manifested by fluid filled fluctuating swellings over the anterior part of both left and right carpi in the two bilateral cases and only the left carpus involvement in the unilaterally affected sheep. Vital parameters for all cases in the flock were within the normal range, indicating an apparently healthy flock.

Blood sample were aseptically collected, using sterile hypodermic needle and syringes, from the thirteen ewes and four rams. Sera obtained was separated and pipetted for serology. Hygroma fluid samples were also aseptically collected, from the three cases with carpal hygroma, for bacteriological procedures. All sera were subjected to Rose Bengal Plate Test (RBPT) with Brucella abortus polyvalent antigen. Positive sera were further subjected to Serum Agglutination Test (SAT) to determine the titer (Table 1). The antigens were obtained from the Central Veterinary Laboratory Weybridge, Surrey, England. The procedure was as described previously by Alton *et al.*, (1988). The hygroma fluid samples were cultured in 'Farrell's medium' and following the growth in this primary medium, the observed colonies were cultured diphasically into both Brucella agar and Serum Dextrose Agar (SDA) plates and incubated at 37◦C in 10 percent carbon dioxide for four days.

Results and Discussion

A total of thirteen sheep consisting of twelve Yankassa ewes and a ram were serologically positive for both Rose Bengal Plate Test (RBPT) and Serum Agglutination Test with titer ranging from 20 to 80 (40 to 160 International Unit) in the serum sample of the affected animals (Table 1). All the samples showed negative growth in the subculture unto Serum Dextrose Agar and Brucella Agar. One of the two sheep with bilateral hygroma was completely negative to RBPT and SAT.

Four of the thirteen sheep that tested positive had their titer between 40 and 160 International Unit (I.U.). This agrees with the Joint FAO/WHO Expert Committee on Brucellosis (1971) which recommended that non-vaccinated sheep and goats showing serum titers of 40 I.U. and above should be considered suspects or reactors. Since there were no history of vaccination and the high titer was demonstrated on repeat testing, two weeks apart, this flock was considered to have an outbreak of brucellosis.

Three of the initial four sheep had high titer positive for brucellosis which was considered to be a high reaction rate, taking into cognizance the number of positive reactors; 13 out of 17 (76%). This rate conforms to the normal epidemiological feature of brucellosis where animals in a flock or herd are at greater risk and infection spreads readily within the flock due to contact.

The study revealed a brucellosis prevalence rate of 76% in the flock studied, it is obvious that like in most parts of

Nigeria, there was evidence of active infections of sheep by Brucellosis in Zaria.

Although the sample size in this survey is smaller in number when compared to that covered in the investigations conducted by Okoh (1980) and Bale *et al.* (1982), it is still a significant finding considering the fact that brucellosis is a reportable disease and has public health significance.

Table 1: Serum Agglutination Test (SAT) results

Sample	SAT (1st Test titre)	SAT (2nd Test titre)
Female	1/80 (1:160)	1/80 (1: 160)
Female	1/20 (1:40)	1/20 (1: 40)
Female	1/20 (1:40)	1/20 (1: 40)
Female	1/40 (1:80)	1/40 (1: 80)
Female	1/20 (1:40)	1/20 (1: 40)
Female	1/20 (1:40)	1/20 (1: 40)
Female	1/20 (1:40)	1/20 (1: 40)
Female	1/80 (1:160)	1/80 (1: 160)
Female	1/20 (1:40)	1/20 (1: 40)
Female	1/80 (1:160)	1/20 (1: 40)
Female	1/20 (1:40)	1/20 (1: 40)
Female	1/20 (1:40)	1/20 (1: 40)
Male	1/20 (1:40)	1/20 (1: 40)

Conclusions

This investigation revealed that 76% of animals in the flock studied were actively infected with Brucella organism. The alarming presence of Brucella organism in the study area can be further confirmed by the isolation from other animals or flocks following brucellosis surveillance in the area. There is need for further work to be carried out on the area of brucellosis in determining its prevalence rate. Also, there is the need for Government to establish nationwide control programme for brucellosis in animals in order to mitigate its spread because of its public health significance and the zoonotic risks that clinicians and in-contact personnel are exposed to in brucellosis infected flocks.

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