EFFECT OF SEASON, SEX, AGE AND BREED ON THE PREVALENCE OF BOVINE ANAPLASMOSIS IN SOKOTO METROPOLIS

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ABSTRACT

A twelve months study on the effect of season, sex, age and breed on the prevalence of bovine anaplasmosis in Sokoto metropolis was conducted. The study was aimed at determining the anaplasmosis infection status of cattle using thin blood smear and packed cell volume (PCV). Four breeds of cattle were used for the study (Friesian, Sokoto Gudali, White Fulani and Friesian- Gudali cross). Blood samples were collected by venupuncture during dry and rainy seasons respectively in 2009, from fifty five cattle at five different farms within Sokoto metropolis. All the fifty five heads sampled were found to be positive for *Anaplasma marginale* with varying PCV values and levels of parasitaemia across season, breed, sex and age. Average parasitaemia levels were significantly higher ($p<0.05$) in the adult animals. No significant difference ($p>0.05$) between sexes and seasons respectively. The breed significantly ($p<0.05$) influence the level of parasitaemia with higher values in the (Exotic) Friesian and Friesian cross than in the indigenous Sokoto Gudali and White Fulani. The average PCV values were however significantly ($p<0.05$) higher in the White Fulan and lower in the Friesian and Friesian cross across season.

Key words:, Anaplasmosis, prevalence, Cattle breeds, Sokoto.

INTRODUCTION

Anaplasmosis, also known as yellow bag or yellow fever, is an infectious disease of ruminants caused by rickettsial parasite *Anaplasma marginale* (Zaugg, 2009). It is mainly trasnsmitted biologically by ticks, mechanically by biting flies and conterminated hypodermic needles, surgical or dehorning instruments (Ollis, 2008).The disease is characterized by fever, anemia, weakness, respiratory distress and abortion; also seen as significant decline in milk production (Ajuni, 2009), morbidity and mortality (Stokka and Falkner, 2000). Outbreaks of bovine Anaplasmosis are usually seasonal occuring during or immediately after the vector season (Ollis, 2008). Although,cattle of all ages may become infected but severity of the disease is age dependent with cattle over 3- years old exhibiting more severe form with rapid onset and death. Yearling calves are reported to have an innate resistance to the disease while cattle aged between 1- 3 years manifest the acute form (Stokka and Falkner, 2009). Sheep may act as reservoirs of infection (Urquhart, 2003). Anaplasmosis is widely distributed throughout the tropical and subtropical regions of the world and occurs in certain portions of the temperate regions (Ollis, 2008). Diagnoses are based on clinical signs, determination of packed cell volume (pcv) and examination of blood using thin blood smears (Ajuni, 2009).Treatment involves intramuscular administration of tetracycline hydrochloride at a dose rate of 22mg/kg body weight on five consecutive days, or the administration of two doses of long acting oxytetracyclin preparation intramuscularly seven days apart, also eliminate the carrier state (Stokka and Falkner, 2009).

MATERIALS AND METHODS

Study area and animals used

Sokoto is located within the sahel savannah belt and extreme northern part of Nigeria between longitudes 4° 8 and 6 °54 and latitudes 12° N and13° 58N. Fifty- five cattle at five different farms; Mabera, Rugi,Arkilla,and Rugi farms respectively were sampled. 25 were males and 35 were females. Fifteen (15) were Friesian breeds, sixteen (16) were Sokoto-Giudali breeds, fifteen (15) were Friesian - Gudali cross and nine (9) were White- Fulani breeds.

Collection of Blood Sample and thin blood smear preparation

The animals were properly restrained, cotton wool was used to apply methylated spirit to clean jugular vein to ensure asepsis. The vein was occluded followed by venepuncture, archived by

the use of an 18 gauge needle attached to a syringe for aspiration of 5 meals of blood from various animals representatives of the herds visited for sampling. Universal sample bottles coated with Ethylene Diamine Tetra Acetate (EDTA) as anticoagulant were used to store the blood collected. The bottles were appropriately labeled and transported to the laboratory in ice packs. No tick was encountered throughout the sampling. Thin blood smear was prepared from each blood sample, by placing a drop of blood on one end of a clean glass slide; a spreader was used to spread the blood gently but firmly along the surface of the horizontal slide so that the blood is dragged behind the spreader to form the film with a feathered edge. It was then air- dried and fixed in methanol for 3- 5 min, stained in 1:10 Giemsa waited for 30 min and rinsed twice with distilled water and once with buffer. The slide was then allowed to dry. The smears were examined under a light microscope at x100 magnification (oil immersion) for presence and identification of *Anaplasma marginale* (Cheesbroug, 1999).

Packed Cell Volume (PCV)

A capillary tube was used to take blood from each sample which moved into the tube by capillary action to fill up to two third of the tubes. Plasticine was used to seal one end of the tubes, and the tubes were placed in haematocrit centrifuge and subjected to centrifuging at 15,000 revolutions per min. After centrifuging, haematocrit reader was used to read PCV.

Data Analysis

The generated data was subjected to statistical analysis using general linear procedure model of SAS (2002).

RESULT

All the fifty five heads sampled were found to be positive for *Anaplasma marginale* with varying PCV values and levels of parasitaemia across season, breed, sex and age. Average parasitaemia levels were significantly higher ($p<0.05$) in the adult animals. No significant difference ($p>0.05$) between sexes and seasons respectively. The breed significantly ($p<0.05$) influence the level of parasitaemia with higher values in the (Exotic) Friesian and Friesian cross than in the indigenous Sokoto Gudali and White Fulani. The average PCV values were however significantly ($p<0.05$) higher in the White Fulan and lower in the Friesian and Friesian cross across season.

DISCUSSION

From the result, The breed significantly ($p<0.05$) influence the level of parasitaemia with higher values in the (Exotic) Friesian and Friesian cross than in the indigenus sokoto Gudali and White Fulani. This is becaue exotic breeds of cattle especially those originating from temperate climates and in particular pure breeds are known to be very susceptible to anaplasmosis (Ajayi and Fabiyi, 1980). The average PCV values were however significantly ($p<0.05$) higher in the White Fulani and lower in the Friesian and Friesian cross across season. This is because WhitFulani are indigenous and hence adapted to the environment. The Average parasitaemia levels were significantly higher ($p<0.05$) in the adult animals. This is because the disease is generally mild in calve due to premunity (shih, 2009).No significant difference ($p>0.05$) between sexes and seasons.

Conclusion

It is concluded that, breed and age have more significance effect on the prevalence of bovine anplasmosis, while sex and season have less significance effect on the disease.

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Table 1: Mean of Pcv and Parasitaemia for age

Age(year)	<1	1	2	3
Pcv (%)	37.318	35.125	26.361	24.455
Parasitaemia	1.0000	1.0000	1.8333	2.1136

Table 2: Mean of Pcv and Parasitaemia for breed

Breed	White fulani	Sokoto gudali	Fr x SG	Friesian
Pcv (%)	32.056	30.625	28.300	24.033
Parasitaemia	1.2778	1.3125	1.5000	2.6333

Table 3: Mean of Pcv and Parasitaemia for season

	Rain	Dry
Pcv (%)	29.0909	27.7636
Parasitaemia	1.6727	1.7636

Table 4: Mean of Pcv and Parasitaemia for sex

	Male	Female
Pcv (%)	28.7500	28.1379
Parasitaemia	1.7115	1.7241