CLINICAL AND HAEMATOLOGICAL FEATURES OF STRESS INDUCED BABESIOSIS IN *BABESIA EQUI* INFECTED INDIGENOUS HORSES

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(Received 6 April 1988; accepted for publication 1 July, 1988).

ABSTRACT

Studies on actively stressed *B. equi* infected premuned indigenous polo horses, manifested severe clinical syndromes characterised by partial anorexia, hyperthermia, lethergy, extreme weakness, marked dehydration, ecchymotic third eye lid, pale mucous membranes, sternal recumbency and coma. Some horses showed complete anorexia, obvious colicy symptoms, watery blood, and haemoglobinuria. The haematologic changes in the affected horses included highly significantly ($P<0.01$) low packed cell volume, reduced haemoglobin concentration, depleted red blood cell counts and highly significantly ($P<0.01$) depleted neutrophils and lymphocytes.

Key Words: Clinical Haemotological, Babesiosis, Polo Horses.

INTRODUCTION

Though some studies on the haematological parameters of local horses in Nigeria (Saror, 1976) and those horses that were plagued with naturally occurring equine babesiosis (Dipeolu and Oduye, 1976, Oladosu and Dipeolu, 1981) had been previously reported, the clinical features and problems of stress induced relapses of babesiosis in premune Polo horses appear to have been ignored.

In this investigation involving 123 local polo horses, an appraisal of the clinical and haematological features of stress induced relapses of Babesiosis in *B. equi* premune indigenous Polo horses, is reported.

MATERIALS AND METHODS

The stressed indigenous horses were brought from different polo clubs to Ibadan and were exposed to long distance *transportation stress,* heat stress (due to over exposure to hot weather), while being kept in temporary stables during the tournament periods, lack of sufficient drinking water and gastrointestinal parasitism.

The horses were clinically examined daily, before, during, and after the tournament from the first day of arrival at the venue of the yearly tournaments,

till the end of the one week polo competition. The horses were checked for pyrexia, tick infestation, ecchymotic third eye lid, jaundice, haemoglobinuria and other major signs of equine babesiosis. Blood and faecal samples were collected for haematology and parasitology.

Horses which showed clinical sings of *Babesia* infections were identified from the 123 indigenous polo horses covered in the screening.

Blood samples obtained in commercial EDTA containers were examined as thin blood smears for *Babesia* and other blood parasites shortly on arrival, and at the end of the polo tournament. The results were grouped into the *B. equi* positives (BP) and the *B. equi* negatives (BN). The mean haematologic values for the PCV% the HB, the RBC, the WBC and the differential leucocytes were calculated and the haematologic values for the BN horses and the BP indigenous premune polo horses, were compared.

RESULTS

Tables 1 and 2 show the effect of the multivariate stress factors on the haematology of 14 of the 123 visiting local polo horses from Kano, Kaduna, Sokoto, Zaria and Lagos. The haematological parameters (i.e. PCV, HB, RBC and WBC) of these horses, evaluated six (6) days after the onset of the week long national polo tournament at Ibadan showed highly significant differences ($P<0.01$) between the means of one hundred and nine (N=109) *Babesia* negative horses compared with the means of fourteen (N=14) horses, which showed stress induced relapses of *B. equi* infections (table 1).

While the mean packed cell volume (PCV %) of the 109 *Babesia* negative horses was 34.66, that of the 14 *Babesia* positive horses was highly significantly ($P<0.01$) reduced to 19.86 due to *B. equi* parasitaemia. Similarly, the mean red blood cell (RBC) value dropped significantly ($P<0.01$) from 6.72 x $10^6/mm^3$ for the N=109 *Babesia* negative to 3.73 x $10^6/mm^3$ for the N=14 *Babesia* positve horses. Faecal examination of the horses from the *Babesia* positive (BP) and the *Babesia* Negative (BN) groups showed evidence of gastrointestinal parasites, identified as strongless, ascarids, pinworms, stomach worms, tapeworms and bots. A highly statistically significant ($P<0.01$) reduction also occurred in the haemoglobin concentrations (HB); and the White Blood Cell (WBC) counts of these horses. (Table 1). The mean differential leucocyte counts were selectively affected (Table 2). There were highly significant ($P<0.01$) reduction in the mean lymphocyte values of the BN and the BP horses (Table 2). The mean Basophils were also significantly ($P<0.01$) reduced.

The observed haematologic alterations on these indigenous horses are more glaringly shown with the histogram in Figure 1 for PCV, Hb, RBC and WBC values and Fig. 2 for the differential leucocyte parameters.

The neutrophils and the monocytes were not significantly ($P>0.05$) affected (Table 2).

DISCUSSION

The result obtained in this study (Tables 1 and 2) showed that most local (indigenous) horses are premuned to equine babesiosis, and, when stressed, acute clinical disease can be precipitated. However, a relatively lower percentage

Table 1

Effect of Babesia Equi Infection on Haematological Values of the Local (Nigerian) Horses (Breed = 1, N = 123).

Haematologic Parameters	*Comparative Sources (Horse Groups)*	*n*	$\bar{X}$	*S.D.*	*S.E.*	*F–Value*
PCV (%)	B. *equi* Negatives Vs	109	34.66	±5.78	±0.55	3.57*
	B. *equi* Positive	14	19.86	±3.05	±0.81	
HB (gm/100ml)	B. *equi* Negatives Vs	109	11.98	±10.59	±1.01	
	B. *equi* Positives	14	5.55	±1,61	±0.43	43.16**
RBC ($x10^6/mm^3$)	B. *equi* Negatives Vs	109	6.72	±1.97	±0.18	
	B, *equi* Positives	14	3.73	±0.63	±0.17	9.62**
WBC ($x10^3/mm^3$)	B. *equi* Negatives Vs	109	8.52	±2.80	±0.27	
	B. *equi* Positives	14	4.26	±1.11	±0.29	6,36**

N = Total No. of Local horses examined
$\bar{X}$ = Mean
S.D. = Standard Deviation
S.E. = Standard Error

** = Statistically significant ($P<0.01$)
n = No. in each category of horses.

Table 2:

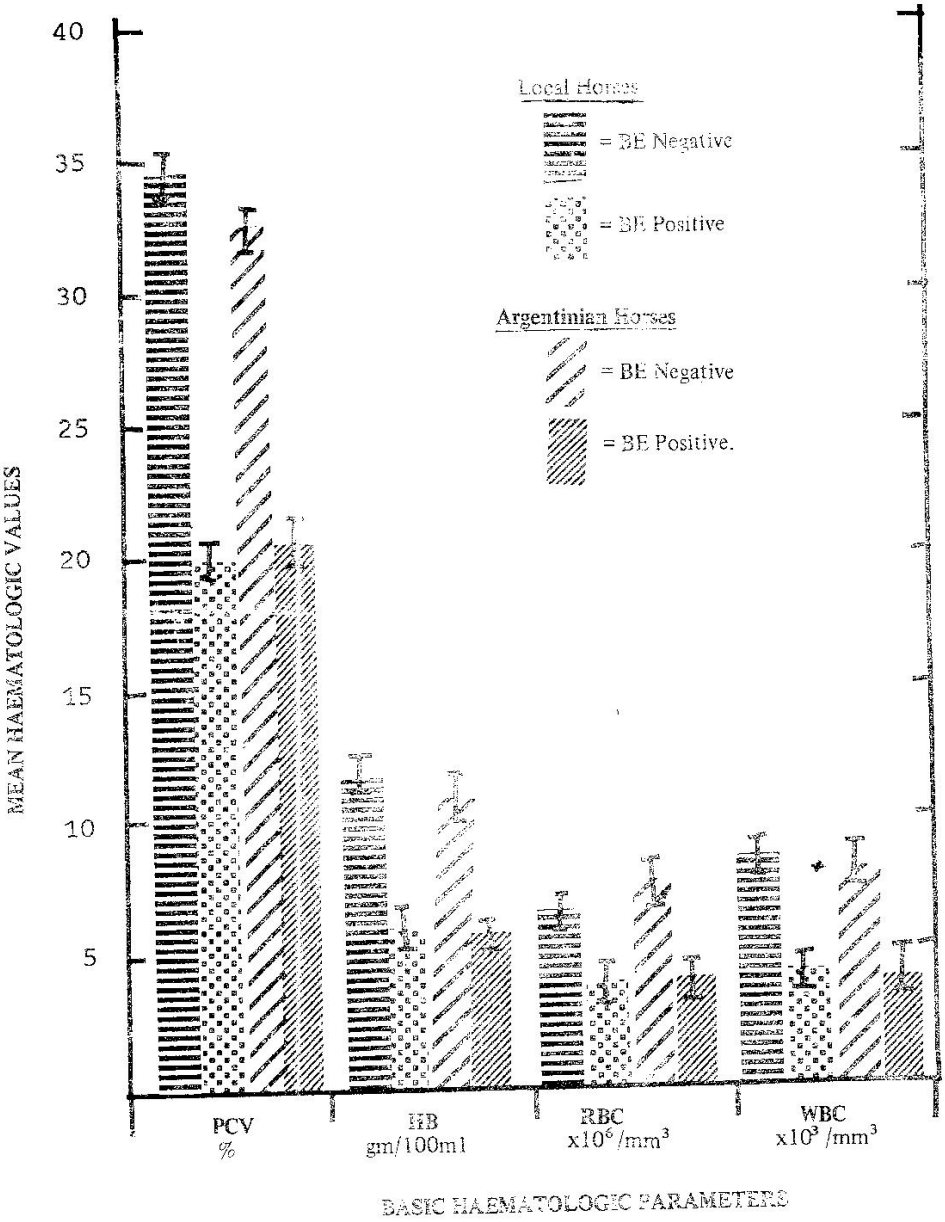
Effect of Babesia Equi Infection on Differential Leucocyte Counts of the Local (Nigerian) Horses (Breed = 1; N = 123)

Haemateologic Parameters	*Horse Groups Sources*	*n*	$\bar{X}$	*S.D.*	*S.E.*	*F–Values*
NEUTRO. (%)	B. *equi* Negatives Vs	109	57.83	±7.46	±0.71	1.30^{ns}
	B. *equi* Positives	14	36.57	±6.53	±1.74	
LYMPHO (%)	B. *equi* Negatives Vs	109	30.84	±7.17	±0.68	4.07**
	B. *equi* Positives	14	17.78	±3.55	±0.95	
EOSINO (%)	B. *equi* Negatives Vs	109	1.44	±2.16	±0.21	2.65*
	B. *equi* Positives	14	1.07	±1,32	±0.35	
MONO (%)	B. *equi* Negatives Vs	109	1.90	±1.54	±0.15	2.23^{ns}
	B. *equi* Positives	14	1.00	±1.04	±0.27	
BASO (%)	B. *equi* Negatives Vs	109	0.22	±0.64	±0.06	5.80**
	B. *equi* Positives	14	0.07	±0.26	±0.07	

N = Total No. of horses examined
$\bar{X}$ = Mean
S.D. = Standard Deviation
S.E. =Standard Error

ns = Not statistically significant (P>0.05)
* = Statistically significant (P<0.05)
** = Highly statistically significant (P<0.01)
n =No. in each category of horses.

Fig. 1. Effect of Babesia Equi (BE) Infection on Basic Haematologic Parameters of Local (L) and Argentinian (A) Horses



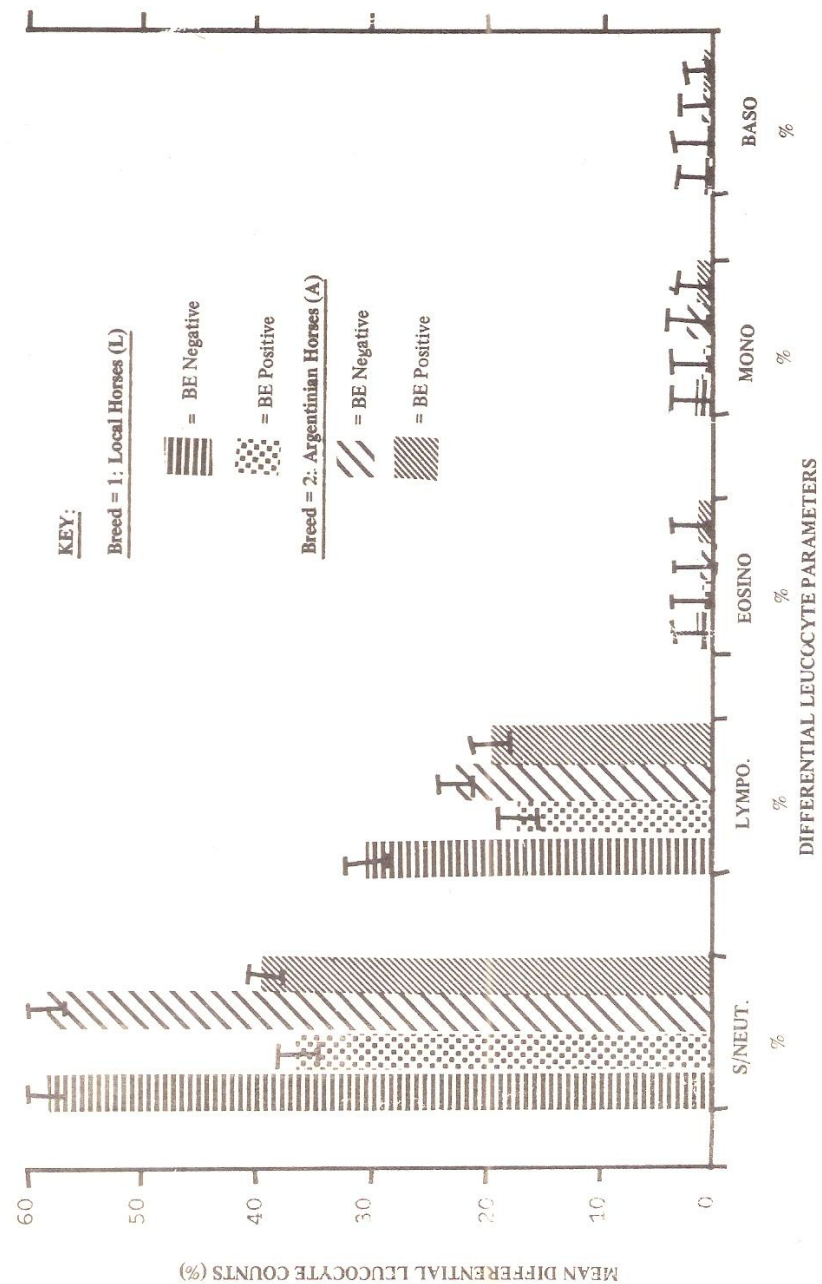


Fig. 2: Effect of Babesia Equi (BE) Infection on Differential Leucocyte Count of Local (L) and Argentinian (A) Horses.

may succumb to clinical babesiosis compared with the exotic (Argentinian) horse breeds as earlier reported (Oladosu, 1987) Whereas in a similar investigation on (Argentinian) horse breeds (Oladosu, 1987) 5% of the stressed Argentinians showed relapsed *B. equi* infections. Only 14 out of 123 (11.4%) of the stressed indigenous (local) horses developed relapsed *B. equi* infections (Table 1).

The most striking feature of this study was that relapse of *Babesia* infections can be stress induced and that loss of the RBC, HB and WBC were highly significantly ($P<0.01$) greater on the B. equi infected local horses (Table 1). This observation seem to explain the reason for the severe anaemia and nae moglobinuria, which are characteristic of *B. equi* infections as previously postulated (Holbrook, 1965; Taylor *et al,* 1969).

However, the comparative haematological changes between the *B. equi* infected local (Nigerian) horses and the imported Argentinian ones showed that the exotic horses reacted more severely to the *B. equi* infection than the local horses (Fig. 1). Major differences also occurred between the two breeds on the major components of the differential leucocyte counts (Fig. 2).

The fact that out of a total of 123 stressed local horses examined, only 14 (11.4%) developed relapsed clinical babesiosis seem to confirm the innate resistance of indigenous (Nigerian) horse breeds to *Babesia* infections.

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