دراسات مبدئية على استجابة العائل لعدوى « البابيزيا بايجمنا » وتأثير ازالة الطحال على طفيليات الدم

د ط.أ. العلاوى ود . ع. عبد المطلب

لقد تم دراسة تأثير ازالة الطحال على ظهور طفليات الدم فى عشرة حيوانات سليمة من العجول الجاموسى والبقرى والأغنام والماعز . ولقد استخدم حيوان من كل نوع ككنترول لمجموعته . لقد تراوحت أعمار العجول الجاموسى والبقرى مابين ١ر٥ — ٢ سنة بينما كانت أعمار الأغنام والماعز بين ٦ — ١٨ شهرا .

أخذت شرائح دموية من الوريد الأذنى لهذه الحيوانات كما سجلت درجات الحرارة يوميا ولمدة ٣٠ يوم وبعد ذلك حقن كل حيوان بواسطة ٥ سم٣ من دم يحتوى على طفيل « البابيزيا بايجمنا » .

بعد ازالة الطحال وبدون حقن لوحظ ظهور البابيزيا والانابلازما فى دم الأغنام والماعز . كما لوحظ ظهور البابيزيا والأنابلازما والثيليريا فى دم العجول الجاموسى والبقرى . كما تراوحت درجات الحرارة لهذه الحيوانات بعد ازالة الطحال ما بين ٣٨ر٥ — ٤٠ درجة مئوية .

بعد حقن الدم المحتوى على طفيل « البابيزيا بايجمنا» شوهد عدم استجابة الأغنام والماعز للعدوى بينما لوحظ هذا الطفيل فى دم العجول الجاموسى والبقرى.

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PRELIMINARY INVESTIGATIONS ON HOST RESPONSE TO *BABESIA BIGEMINA* INFECTION and THE EFFECT OF SPLENECTOMY ON THE BLOOD PARASITES

(With 4 figures)

By

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SUMMARY

The effect of splenectomy on blood parasites was studied on 14 clinically healthy animals. *Babesia* sp. and *Anaplasma ovis* were observed in sheep and goats.

In buffalo and cow calves, after operation *Babsia*, *Anaplasma* and *Theileria* sp. were observed· *Babesia* sp. were found in greateer numbr than *Anaplasma* sp. and *Thiileria* sp.

Concerning the host response to *Babesia sp*· infection,sheep and goats were resistant to experimental infection while buffalo and cow calves were susceptible.

INTRODUCTION

The effect splenectomy on blood parasites was studied by some investigators. GALLIARD and CEBE (1941, 1949) detected different parasites in splenectomized buffaloes. WRIGHT and WOODFORD (1958) and RAYNAUD (1962 observed *Babesia bovis* and *Babesia argentina* in spenctomized cattle. FOLKERS and KUIL (1967) demonstrated *Babesia bovis* and *Theileria* sp. in splenectomized cattle, *Babesia motasi* and *Anaplasma bovis* in splenectomized sheep and goats. GALLIARD and C4BE (1941) stated that *Babesia agrentina* leads to parasitaemia and death as a result of splenectomy. ZAKI (1965) detected *Babesia, Theileria* and *Anaplasma* sp. in Egyptian cattle, buffaloes and sheep.

The host response to *Babesia Bigemina* infection was studied by different authors. LESTOQUARD (1931) and MARTYYIAN (1956) succeeded in producing experimental infection with infected blood containing *Babesia bigemina*

in non-splenectomized buffalo calves. ENIGK, FRIEDHOFF and WIRAHADIREDJA (1963) mentioned that several species of ruminants were susceptible to infection with *Babesia motasi* or *Babesia ovis* while others were resistant. ENIGK and FRIEDHOFF (1963) could infect a splenectomized gazelle with *Babesia bigemina*, splenectomized red and fallow deer were not susceptible JOHNSTON and TEMMEMAGI (1969) succeeded in infecting a buffalo heifer with *Babesia argentina*. BROCKLESBY, HARNESSEL and SELLWOOD (1971) demonstrated *Babesia divergens* in the blood of experimentally infected calves.

The aim of this work is to study the effect of splenectomy on blood protozoa using different hosts and to investigate the response of various hosts to *Babesia bigemina*.

MATERIALS AND METHODS

Splenectomy was performed on 14 clinically healthy animals (4 buffalo calves, 4 cow calves, 3 sheep and 3 goats) one animal from each group was kept as a control. Calves were between 1.5-2 years, sheep and goats were between 6-18 months. Blood smears were taken from the ear vein before and after splenectomy for 30 days. The smears were stained by Leishman's stain (COLES, 1967). Body temperature was recorded daily for 30 days after splenectomy.

For studying the host response to *Babesia bigemina*, the same animals were used. One animal of each group was kept as a control. All these animals were proved to be free from blood parasites as ascertained by splenectomy and were kept under complete hygenic conditions in tick free rooms. Each animal was inoculated i.v. with 5 ml of blood containing *Babesia bigemina* (parasitaemia 2-5%) obtained from an acutely infected calf. Body temperature and blood smears were recorded daily.

RESULTS

Splenectomy of sheep and goats resulted in sporadic appearance of *Babesia* species and *Anaplasma ovis* each in one goat and one sheep during the examination period from 4 to 30 days post splenectomy. In buffalo and cow calves, *Babesia* sp., *Theileria* sp. and *Anaplasma* sp. were observed after but not before splenectomy. *Babesia* sp. constituted a higher proportion than *Theileria* sp. and Anaplasma sp. Body temperature of all splenectomized animals was between (38.5 – 40°C) as shown in figures 3 and 4.

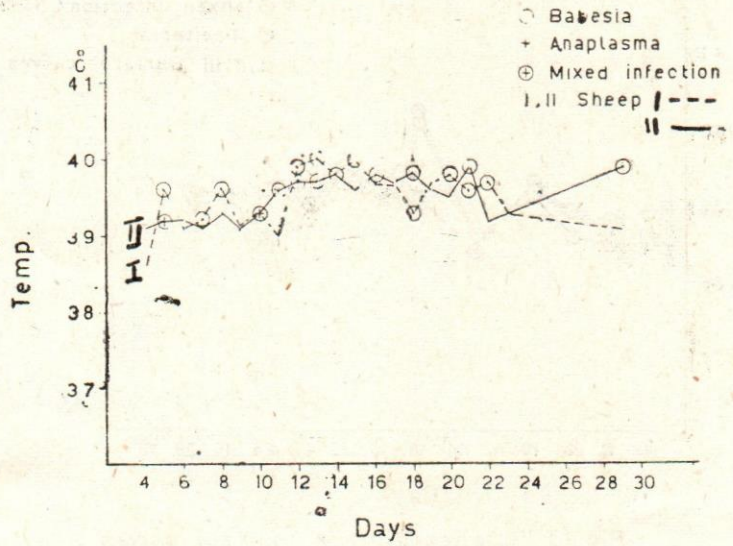

Fig. 1 Splenectomized sheep

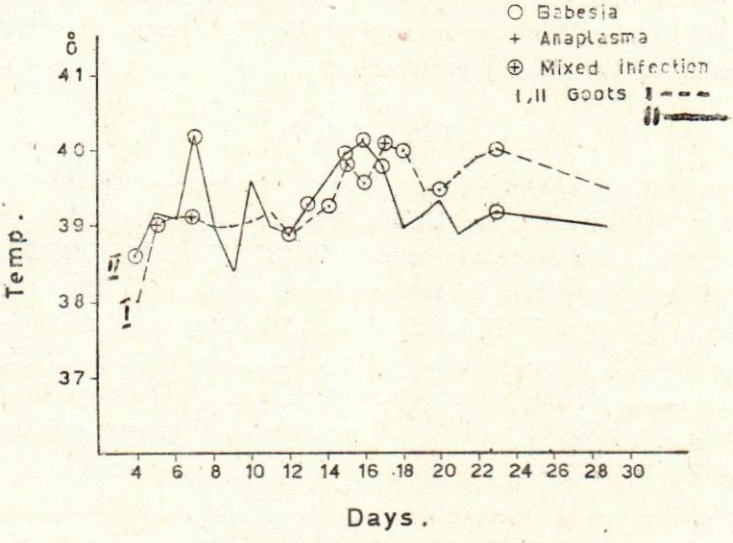

Fig. 2 Splenectomized goats

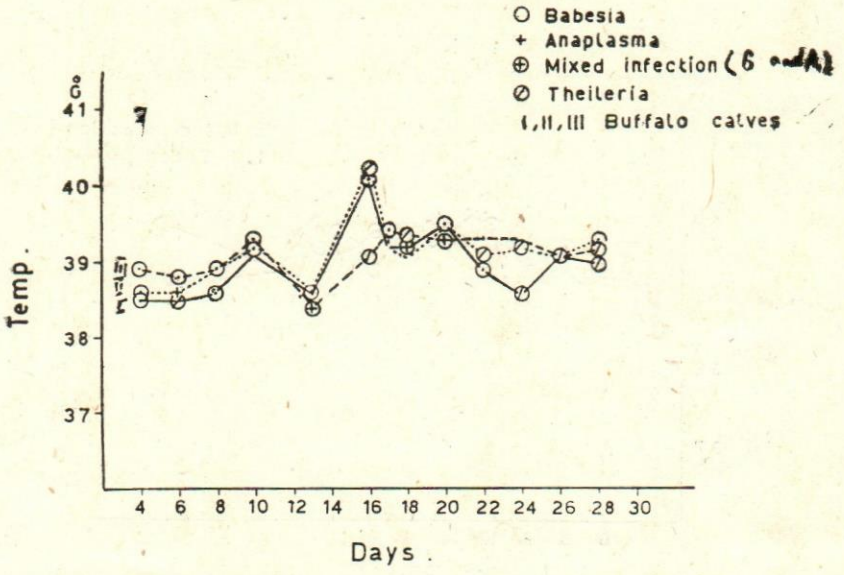

Fig. 3 Splenectomized buffalo calves

Response of experimental infection with infected blood containing *Babesia bigemina* was successful in buffalo and cow calves while it failed in sheep and goats. In case of buffalo and cow calves, *Babesia* sp. appeared in the peripheral blood from the third day of infection. The parasite number was great (3-8 infected red blood cells in one microscopic Field). Treatment with Acaprine was necessary on the 6th day of infection.

DISCUSSION

The effect of splenectomy on blood parasites was discussed by many investigators. GALLIARD and CEBE (1941 and 1949) observed *Babesia bovis, Babesia argentina and Babesia bigemina.* WRIGHT and WOODFORD (1962) observed *Babesia argentina* in splenectomized cattle. On the other hand, MIESSNER (1931) and GALLIARD and CEBE (1941) stated that splenectomy resulted in death of operated animals as a result of parasitaemia. FOLKERS and KUIL (1967) demonstrated *Babesia bovis* and *Theileria* sp. in splenectomized cattle, they also observed *Babesia motasi* and *Anaplasma ovis* in splenectomized sheep and goats.

In this work, it was observed that *Babesia* sp. and *Anaplasma ovis* appeared in splenectomized sheep and goats. In buffalo and cow calves, *Babesia* sp. *Theileria* sp. and Anaplasma sp. were observed.

The response of infection with *Babesia bigemina was studied also in this* work. From the mentioned results it is obvious that buffalo and cow calves were susceptible to experimental infectiin while sheep and goats were not. Treatment was necessary in cow calves only because of the severity of the clinical signs. The response of infection with *Babesia bigemina* was studied by ENIGK and FRIEDHOFF (1963) who succeeded to produce infection in a splenectomized gazelle with *Babesia bigemina,* however, the outher failed in case of sheep and goats. CALLOW (1961), on the other hand, reported that several species of ruminants, whether splenectomized or not, were susceptible to experimental infection while others were resistant to *Babesia* infection. The authors also added that although clinical signs were abscent, the parasites were observed in blood smears.

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