TITLE:

"PATHOGENESIS, EPIDEMIOLOGY AND EFFECTS ON THE MALE REPRODUCTIVE SYSTEM OF TRYPANOSOMA EVANSI IN SMALL EAST AFRICAN GOATS".

By

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ABSTRACT

This study was undertaken to investigate the pathogenesis of Surra in goats, the effect on fertility and the role played by the small East African goats in the epidemiology of camel Surra.

For pathogenesis study, eight goats four in infection and four in control groups were used. The infection group was infected with T. evansi, "Olmisor" strain via the jugular vein at a parasite density of 1 x 10^5/ml. The goats were monitored for temperature rise, packed cell volume (PCV), red blood cell count (TRBC), white blood cell count (TWBC), haemoglobin concentration (Hb), mean copurscular volume (MCV), total protein (TP), glucose and serum enzyme levels. The invasiveness of the parasite (T. evansi) was also evaluated.

For effect on fertility, nine male goats (bucks) six in infection and three in control groups were used. The infection was done as described above. After infection, the bucks were electro-ejaculated once a week for twelve weeks and the semen evaluated for volume, color, live/dead ratio, abnormalities and total spermatozoa count.

For the evaluation of role of goats in the epidemiology of surra, Stomoxys calcitrans flies were used in an attempt to transmit the disease from goat to goat and goat to camel. Needle puncture was used, simulating what may happen in some managemental practices (e.g. ear notching) where the disease may be passed from sick goat to a healthy camel via contaminated equipments.

The results indicated that experimental T. evansi infection in goats caused significant drop in PCV, Hb and TRBC, emaciation and goats carried the disease for a long time (eight months). One buck died on the eighth week either from a different disease exarcebated by T. evansi infection or atypical response to T. evansi infection.

Fifty percent (50%) of the infected bucks developed visible orchitis and later testicular atrophy. Semen quality in all infected bucks deteriorated severely within ten weeks post infection with some bucks becoming totally aspermic. Histological

examination of the atrophied testicular tissue indicated empty epididymal ducts and seminiferous vesicles in early cases and severe calcification with clogged seminiferous vesicles and epididymal ducts in late cases.

Trypanosoma evansi was found in extravascular locations like lymph nodes, peritoneum, synovial fluid, scrotal sac and cerebrospinal fluid. Stomoxys calcitrans was unable to transmit T. evansi both in goats and camels, but needle puncture readily transmitted the disease.

These findings indicate that T. evansi can be of paramount importance in goats; firstly due to emaciation observed in infected bucks which would mean poor dressing carcass weight and secondly due to its effect on male reproductive organs which means that T. evansi can possibly be a cause of infertility in bucks.

The readiness with which T. evansi invaded extravascular tissues would mean that the disease can be inaccessible (once it extravasculates) to drugs other than asernicals and hence the goats could remain infected for very long periods providing a ready reservoir for this disease in camels.

Transmission of the disease by the needle punctures would mean that the disease can be transmitted from sub-clinically sick goats to healthy camels by managemental practices (e.g. ear notching) when the same devices are used.