RESEARCH COMMUNICATION

SEROLOGICAL EVIDENCE OF BOVINE LEPTOSPIROSIS IN MALAWI

J. G. MYBURGH(1), G. P. STALEY(2) and SANETTE M. VAN DER MERWE (1)

ABSTRACT


Two hundred and seventy-five serum samples from cattle in Malawi were tested as a pilot survey for Leptospira antibody titres. Fifty-nine (21.4 %) of the animals were positive for leptospirosis, while 35 (12.7 %) animals reacted inconclusively. Titres to L. hardjo and L. pomona serovars were the most prevalent. Results are also discussed with reference to the areas where samples were collected.

INTRODUCTION

Leptospirosis is a disease of world-wide economic and zoonotic importance (Ellis, 1984). Leptospira infections may be the cause of enormous economic losses in the form of abortions, stillbirths, deaths, decreased milk production and infertility (Amatrejo & Campbell, 1975; Faine, 1982; Ellis, 1984). The disease in man may vary from inapparent to severe infections and death (Faine, 1982; Hanson, 1982).

Epidemiological information on leptospirosis in Africa is lacking (Ellis, 1984), however the serological surveys that have been done in Africa, suggest that leptospirosis plays an important role as a pathogenic disease of livestock (Burdin, Froyd & Ashford, 1958; Botes & Garifallou, 1967; Amatrejo et al., 1975; Swanepoel, Blackburn, Lander, Vickers & Lewis, 1975; Herr, Riley, Nesar, Roux & De Lange, 1982; Ellis, 1984; Te Brugge & Dreyer, 1985; Feresu, 1987). As far as can be ascertained, there are no records available on the occurrence of leptospirosis in Malawian cattle. The aim of this pilot study was to determine the presence of Leptospira antibodies in Malawian cattle.

MATERIALS AND METHODS

Two hundred and seventy-five samples were obtained mostly from abattoirs in Malawi and were collected in vacuum tubes at slaughter. The cattle were predominantly male of at least 18 months of age and originated from throughout the country. Samples were refrigerated at approximately 4 °C for 14 days before being flown to the Republic of South Africa. The serological tests were done at the Veterinary Research Institute, Onderstepoort.

The sera were tested using the microscopic agglutination micro-volume technique (Sulzer & Jones, 1978; Herr, Hunter & De Lange, 1987). The following antigens were used: canicola, copenhageni (icterohaemorrhagiae), grippotyphosa, hardjo, mini (szwajizak), pomona, pyrogenes and tarassovi (byos).

Antigens were grown on liquid EMJH medium and used between 4-14 days when the growth of the leptospires exceeded 2 x 10^7 organisms per ml (Sulzer & Jones, 1978). The end-point titre was taken as the dilution where 50 % of the organisms, as compared with the negative control, were either absent or visibly agglutinated and where there was a greater degree of agglutination in the immediately preceding lower dilution. A titre of less than 80 was regarded as negative, 80 as inconclusive and 160 or higher as positive.

RESULTS

Fifty nine (21.4 %) of the animals tested, were positive for leptospirosis, while 35 (12.7 %) animals reacted inconclusively (Table 1).

The serum samples were tested against 8 serovars and the total number of positive reactions against these serovars are given in Fig. 1.

Serovars hardjo and pomona were the most prevalent if the total number of positive reactions are taken into consideration (Fig. 1).

DISCUSSION

The occurrence of positive titres to Leptospira organisms in the animals tested, indicate that Leptospira infections may be the cause of enormous economic losses in the form of abortions, stillbirths, deaths, decreased milk production and infertility (Amatrejo & Campbell, 1975; Faine, 1982; Ellis, 1984).
pomona organisms are present and that cattle are frequently exposed to these organisms. Fifty-nine of the 200 animals tested (21.4%), were positive for leptospirosis. These results suggest that leptospirosis might play an important role as a bovine pathogen in Malawi.

The central region of Malawi (Dowa, Kasungu, Lilongwe and Nchisi) appears to have the highest prevalence of positive titres to Leptospira organisms (Table 1).

The Republic of Malawi is a land-locked central African state, located south of the equator. It is 840 km from north to south, with varying width in 80 km to 160 km (MacGregor Hutcheson, 1987). It has a total area of 118 484 km², including 24 208 km² of inland water and is aligned along the southern continuation of the East African Rift Valley system (MacGregor Hutcheson, 1987). Malawi is a country with a high annual rainfall and a wet environment. Most of Malawi receives an annual rainfall of 760-1 015 mm, but some areas in the higher plateaux experience over 1 525 mm (MacGregor Hutcheson, 1987). Temperature and moisture present, could provide suitable conditions for the survival of Leptospira organisms.

Animal husbandry practices where cattle, sheep, goats and pigs roam freely create ideal conditions for direct, intra-species and inter-species transmission. Indirect and direct bovine to bovine transmission is of greatest importance in strains adapted to, and maintained by cattle, e.g. serovar hardjo (Ellis, 1984). Strains maintained by other domestic animals may also play a role in infecting cattle, e.g. serovar pomona maintained in pigs (Hanson, 1982). Considering the serology results it appears that serovar pomona is second only to hardjo in prevalence and the role of pigs in the epidemiology of bovine leptospirosis in Malawi, is to be investigated (Fig. 1).

Malawi has a wide range of free-living wild animals and the farm management practices and environmental conditions provide ample opportunity for indirect contact with cattle to occur. Wild animals could play an important role in the epidemiology of bovine leptospirosis, because positive titres to leptospirosis have been reported in several species of game (Krauss, Roettcher, Weiss, Danner & Hübbschle, 1986; Hunter, Flannam, Myburgh & Van der Merwe, 1988).

This pilot survey indicates that Leptospira infections occur in cattle in Malawi and the possibility therefore exists that it may occur in other species as well as man. Isolation of Leptospira organisms from cattle should be attempted.

ACKNOWLEDGEMENTS

The authors wish to acknowledge the excellent cooperation and help of the Malawian Department of Agriculture, South African Department of Foreign Affairs, Dr S. Herr, Mr G. Schiele and the personnel of the Reproduction/Bacteriology section VRI Ondersteypoort.

REFERENCES


HERR, S., HUNTER, PAMELA & DE LANGE, J. F., 1987. Leptospirosis manual: a practical laboratory guide to the serology and Isolation of Leptospira, Section of Reproduction, Veterinary Research Institute, Onderstepoort 0110, RSA.


