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BOVINE CLOSTRIDIAL INFECTIONS IN ZAMBIA (1985–1994)

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ABSTRACT

Retrospective surveillance study of clostridial infections of cattle in Zambia, for the period 1985 to 1994, showed that out of the 318 cases observed, 62.8% and 24.2% were from Western and Southern provinces, respectively. Of the 6 clostridia species identified, *Clostridium septicum* (38.1%) followed by *C. chauvoei* (36.2%) and *C. perfringens* (13.2%) were dominant. Although the highest incidence for clostridial infections was in 1989 (75 cases) and 1990 (77 cases), the number of *C. perfringens* cases seemed to increase. More cases were found in the dry season until the onset of the rains, that is, the period August to December.

Key Words: clostridial infections, surveillance, bovine, Zambia

The clostridia produce a variety of diseases in a number of animal species. The diseases are manifested in two general ways; first as an acute toxemia such as in botulinum and tetanus where tissue changes are insignificant; and second as a gas oedema where oedema is general and gas formation is common[4,7]. Although clostridial diseases have been known to exist in Zambia for a long time, there is little information on their epidemiology. The purpose of the present study was to review the clostridial infections of cattle in Zambia for the period of 1985 to 1994, and attempt to link the epidemiological factors responsible for the maintenance and spread of these diseases.

The materials for this survey were obtained from specimens submitted for routine laboratory examinations. Laboratory examination of the specimens from bovine suspected of clostridia infections, from different parts of the country, was carried out at

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the Central Veterinary Research Institute, Balmoral, Lusaka. Routinely, suspect materials (e.g. muscle) were subjected to bacterial isolation and identification using standard bacteriological techniques[4,7].

The survey covers the period of 1985–1994, during which 318 cases of bovine clostridia infections were confirmed. The provincial distribution of *Clostridium* species showed that 62.8% of the cases were from Western, 24.2% from Southern, 6.0% from Lusaka and 2.8% from Central provinces while the rest had less than 2% with no case reported from Luapula province. It was also observed that most of the cases reported from Western and Southern provinces were from the plains of the Zambezi river[1]. In these areas, the distribution of the clostridial infections, as depicted in Fig. 1, for cases occurring during 1985–1994 is related to the fact that farmers graze their animals in the flood plains[6] of the Zambezi river.

During 1989 to 1991, more *C. septicum* and *C. chauvoei* cases were recorded than the other years in the period of study (data not shown). However, the number of *C. perfringens* cases showed an increase in the last four years reaching 20 cases in 1994. Table 1 shows the monthly distribution of the cases. More cases were recorded between August and January with a peak between August and November.

By virtue of the resistant spore which the clostridia organisms produce, the natural habitat of the majority of the species in this genus is the soil in which they are active as agents in the soil fertility. Soil composition plays a part in determining the survival of *C. chauvoei* in areas of high prevalence[3]. In Zambia this may apply to all spore forming bacteria species. Besides clostridial infections, anthrax is more endemic in Western province than the rest of the country[1] implying that Western province soils especially areas close to and around the plains of the Zambezi river may account for a high prevalence of these spore forming bacteria.

Transhumans grazing pattern on the Zambezi river plains[6] may play a part on the epidemiology of the bovine clostridial diseases, that is, exposing the animals to spore contaminated soils during the dry season until the onset of the floods in December or January depending on the rain pattern each particular year. The flooding of the Zambezi river during years of heavy rainfall may also contribute to the spread of the spores by the river water.

Bagadi noted that rainfall seems to play a part in the increase on the number of some clostridial species cases[2] reported each year. It is likely that between 1989 and 1991 there was more rainfall compared to the other years during the period of study, hence, accounting for the increase in the number of *C. septicum* and *C. chauvoei* cases reported during those years.

The cause of the recent increase in the number of *C. perfringens* cases is not clearly known. As pointed out by Mweene et al.[5], lack of sufficient specialized veterinary personnel prevents an exact assessment of the prevalence of clostridia infections in Zambia. However, our records indicate that the cases are widespread.

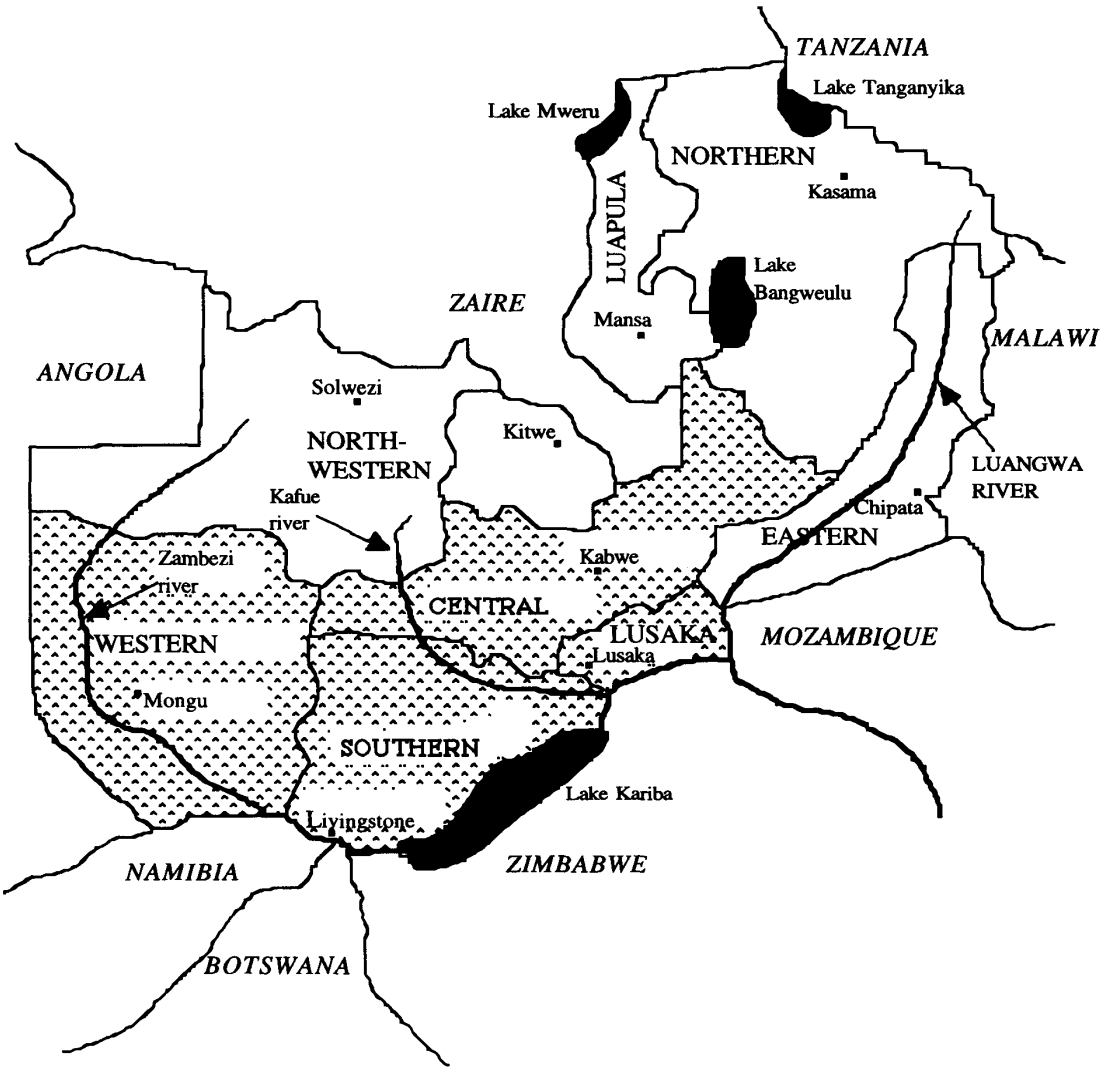

Fig. 1. Map of Zambia. The shaded area, ⬭, shows the provinces where clostridia were isolated. Lakes are shaded in black.

Further research, to observe the relationship between vaccine usage and variations in clostridia infection incidence must be carried out. This is to enable implementation of measures that will eventually reduce the disease incidence in the bovine population. The role played by wildlife in perpetuation of the disease in nature needs to be investigated.

Table 1. Monthly distribution of *Clostridium* species associated with bovine diseases in Zambia.

Clostridia species	J	F	M	A	M	J	J	A	S	O	N	D	Total
C. septicum	4	7	6	3	2	3	8	17	28	21	14	8	121
C. chauvoei	5	2	1	1	8	5	10	19	18	21	17	11	115
C. perfringens	6	—	2	2	2	1	—	9	,	4	8	5	42
C. hystolyticum	—	—	—	—	—	—	—	1	—	1	—	—	2
C. tetani	—	—	—	—	—	—	—	—	—	—	—	1	1
C. hemolyticum	1	—	—	—	—	—	—	—	—	—	—	—	1
C. spp.	2	2	2	1	—	4	1	2	2	8	9	3	36
Total	18	11	11	7	12	13	19	48	51	55	45	28	318

The letters under the heading month above, are months of the year starting from January to December. —', indicates that either the sample was negative for clostridia or was not tested.

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