

LEPTOSPIROSIS: CURRENT REPORTS ON EPIDEMIOLOGY IN TROPICAL AND SUB-TROPICAL AFRICA

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SUMMARY

Leptospirosis is one of the major causes of big losses in the livestock industry. Reduced milk production, stillbirth, abortions and infertility frequently occur as a result of infection by leptospires. Although in some parts of the world leptospirosis has been carefully monitored and controlled, the disease is still one of the least studied in most of the tropical and sub-tropical countries of Africa.

INTRODUCTION:

Leptospirosis is a zoonosis, caused by the spirochete *Leptospira interrogans* (*L. interrogans*). The microorganism is worldwide distributed and can infect most mammals as well as some reptiles. The bacterium, *Leptospira*, was first described by Inada (1916) and later by Noguchi (1917) as the causal agent for human leptospirosis, a disease also commonly known as Weil's Malady (Weil, 1886) in humans or Stuttgart's disease in the dog.

According to WHO reports (1967), *L. interrogans* consists of 16 serogroups with a total of 150 serovars. In literature all leptospires are described under their serovar names. With the improvement of diagnostic methods it has been shown that leptospirosis in livestock is inadequately defined (Thierman, 1984). This is particularly the case in tropical countries where little data is available concerning the development of the disease (Ellis, 1984).

The earliest reports on the existence of leptospirosis in Africa were by Donatien and Gayot (1950) in Algeria, Cordier (1953) in Tunisia and by Van Riel (1955) in the then Belgian Congo. Burdin and Froyd (1956), for the first time, reported leptospirosis in cattle, goats and sheep in Kenya. Leptospires isolated were later identified as *L. grippotyphosa* (Burdin *et al.* 1958).

Due to relatively little data, most of the information of leptospirosis in tropical and sub-tropical Africa, for instance, has been obtained from extrapolation of results obtained from elsewhere eg. Australia, South America, and Europe (Mhoma, 1976; Lins and Lopez, 1984).

Whereas there is evidence on the existence of leptospirosis in animals and humans, based on serological finds (Burdin, 1963; De Geus, 1968; Forrester *et al.* 1969; Ezeh and Agba, 1982), few

bacteriological or clinical study reports of the strains prevalent in tropical Africa are available. In 1976, Tabel and Lasos reported an outbreak of bovine leptospirosis in Kenya due to *L. grippotyphosa*. Other cases were reported by El Vali (1978) in the Sudan, Van Riel *et al.* (1971) in Senegal and Kenya and Uganda by Ball (1966) and in Tanzania by Semuguruka (1974).

Epidemiology:

Basically, all mammals may be infected by one or more serovars of *L. interrogans*. However, only a limited number of serovars appears to be enzootic in a particular geographical zone. A serovar may permanently remain in one or more definite hosts, in a given environment. Consequently, in a specific region a serovar may adapt itself to one or more animal species (Blackmore and Schollum, 1980; Thierman, 1984). Cattle may be infected by specifically adapted serovars (e.g. serovar *hardjo*). This serovar appears to be independent of region and its transmission is mainly direct from an infected cow to a healthy one, (Elder and Ward, 1978). Furthermore, incidental infections in cattle may occur through serovars maintained by other domesticated or wild animals (Ellis, 1984). These include rodents, in particular, the brown rat (*Rattus rattus*) which is the natural carrier of the leptospires. Tropical Africa is rich in free living wild animals. The livestock keeping system (free grazing) favours an unlimited contact between cattle and wild animals and hence the big chances of transmission of the disease. Incidental infections are generally maintained by climatic conditions that favour the survival of the leptospires outside the body of the host (Buxton and Fraser, 1977). Such climatic factors include: Warm (30 - 40°C), humid and slightly alkaline conditions (pH 7.5 - 8). Similar surroundings are

frequently found in most of the tropical African countries. In drier regions incidental infections may be limited to water holes or may be seasonal depending on rainfall (Doherty, 1967; D'Souza, 1983).

Prevalence:

Accurate estimation of prevalence of leptospirosis worldwide is difficult to achieve. Serological reports indicate a prevalence of 15% for cattle and 8% for swine (Hanson, 1972), although rates may be considerably higher (Rubin, 1971).

There is evidence of widespread infection in bovines throughout tropical and sub-tropical regions of the world. Antigens indicate that in these regions infection with the *hebdomadis* group strains is predominant. Such predominance has been demonstrated in Kenya (Ball, 1966) in Senegal (Van Riel *et al.*, 1971) in Sudan (El Vali, 1978) in Nigeria (Ezeh and Agba, 1982). Similar predominance has been reported in tropical Southern America (Acha *et al.*, 1963; Clarke *et al.*, 1966; Jelambi *et al.*, 1976; Rivera *et al.*, 1981) as well as in Australia (Elder and Ward, 1978) and in the Far East (Wisseman *et al.*, 1955; Carlos *et al.*, 1970).

The predominance of the *hebdomadis* serogroup may be due to the occurrence of serovar *hardjo* which is known to be a cattle adapted strain (White *et al.*, 1982). In Kenya both *hardjo* and *wolffi* serovars were frequently found (D'Souza, 1983). Serologic findings also indicate prevalence of serovars belonging to other serogroups, with variation among different geographical zones. Likewise, the distribution of incidental infection is

variable. The *pomona* serogroup antibodies appear to be the second most commonly detected in Senegal (Van Riel *et al.*, 1971), while in the Sudan and in Nigeria the *tarassovi* and the *ballum* groups take the second and third places respectively (El Vali, 1978; Ezeh and Agba, 1982).

Infection of wild animals, living close to human settlements, with strains of a certain serogroup may, for instance, be reflected by the predominance of specific antibodies in serological surveys on cattle. In this case rather uncommon serogroups may incidentally appear most prevalent (Spinu and Topciu, 1978; Damude *et al.*, 1979).

CONCLUSIONS

There is a need for intensive research on leptospirosis and especially on the causal serovars in the tropics. The limited reports on the distribution of the disease have indicated how comparatively little this zoonotic disease has been studied in Africa. Such studies will facilitate control and prevention of leptospirosis.

Although therapeutical measures and prophylaxis have effectively been carried out elsewhere in the world (Ellis, 1984), little guarantee is available that such measures will be equally applicable in the tropics. This is especially important in prophylaxis where multivalent vaccine is used (Merchant and Paker, 1977), which must contain the serovars endemic in the respective region. Predominant serovars are not known for certain in most of the African countries and hence any vaccinations, using foreign vaccines, are likely to be blind and ineffective.

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