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Epidemiology of Leptospirosis -Kerala Scenario

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ABSTRACT

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Leptospirosis is a serious emerging disease in Kerala. Hitherto there is no technical publication on this from Kerala. The present paper gives a review of relevant references, the prevalence and other epidemiological aspects, including the rat fauna of Kerala. A few points on the control measures are also given.

Keywords: Leptospirosis, Zoonosis, Spirochaetes, Rodents

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INTRODUCTION

Leptospirosis is one of the major emerging zoonotic bacterial diseases. It has more than 8 synonyms including Weil's disease. In India it posed as a public health problem from 1980 onwards, even though isolated cases were detected prior to this. This article is intended to give an idea about the epidemiological aspects, giving accent to Kerala situations, especially to those involved in the control of this disease which is desirable and even essential.

REVIEW OF LITERATURE

W.H.O (2003) has given a noteworthy account of 'Human Leptospirosis Guidance for Diagnosis, Surveillance and Control'. NICD (1997) in CD Alert gave an account of the serogroups and serovars and the prevalence of Leptospirosis in India. Other relevant references are cited under 'References'. A résumé of literature shows that hitherto there are no technical publications on Leptospirosis from Kerala.

PREVALENCE

According to NICD report, prevalence rate of Leptospirosis is high in Andamans, Bengal, Gujarat, Karnataka, Andhra Pradesh, Tamil Nadu and Kerala. It assumed epidemic dimensions first in Gujarat in 1980.Table I gives the incidence in Kerala from 1999 to 2009. (Source: Directorate of Health Services)

The average mortality rate is 10% in confirmed cases. W.H.O report states that the prevalence in tropical countries is nearly 100 per 100000 population. Highest prevalence is after the rainy season.

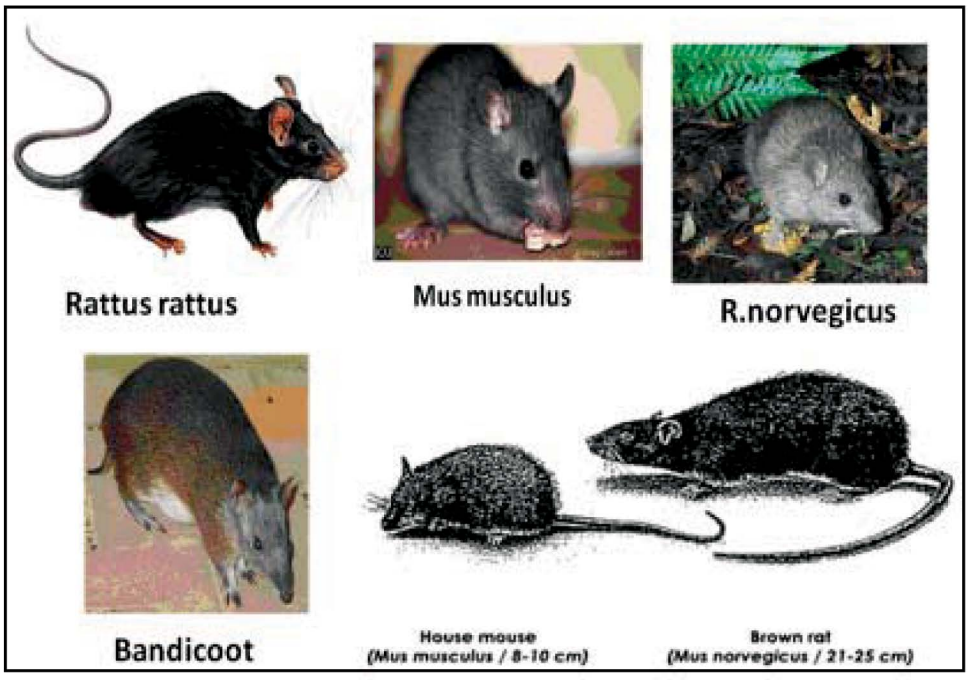

Figure 1. **Rodents that are primary hosts of Leptospirosis**

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Table 1. Cases and death over the years								
Year	1999	2000	2001	2002	2003	2006	2008	2009
Case	2044	2216	2582	2128	1569	1811	1288	1250
Death	82	96	119	181	124	106	116	106

Causal Organism

Leptospira (Greek 'leptos'=fine and Latin 'spira'=coil) are ubiquitous spirochaetes. They are spiral-shaped bacteria that are 6-20 ìm long and 0.1 ìm in diameter with a wavelength of about 0.5 ìm. Leptospira have a Gram negative-like cell envelope consisting of a cytoplasmic and outer membranes. One or both ends of the spirochete are usually hooked. Because they are so thin, live Leptospira are best observed by dark field microscopy. Saprophytic species are usually contaminants of surface water and the pathogenic species are in the hosts' distal convoluted tubules of the kidneys, other organs, semen blood and body fluids. Stimpton named it as Spirochaeta interrogans due to its shape like a question mark and the name has remained. Leptospira interrogans is infective as long as it is moist and can remain outside the host in water or moist soil for six months or more. Saline water is detrimental for its multiplication.

Mode of Transmission

The primary hosts are rodents especially rats. Common rats in Kerala are Rattus rattus, Rattus norvegicus, Mus musculus, Bandicoota indica, B.malabaricus, B.bengaliensis, Nosokia bengaliensis and Tetera sp. (field). (See Plate 1) An idea about the taxonomy, bionomics is a sine qua non for the epidemiological study of Leptospirosis. For example bandicoots usually visit drains, sewage canals, road and roadside water collections after rains and are responsible for urban infections. Mus musculus are generally found in store rooms and warehouse and contribute for infection through food articles. Rattus rattus is peridomestic and domestic and has great epidemiological bearing. The natural history of rodent zoonotic diseases like leptospirosis, plague, scrub typhus etc. is as follows. There is always a permanent reservoir in rodents in the forest areas ie. Sylvatics. From forest areas it recedes to the bushy scrub areas ie. Campestral and then uncultivated lands and waste lands ie. Ferral and then to paddy, sugarcane and other cultivated areas ie. Field and from the field to peridomestic and Domestic rodents especially rats. The role of veterinary and agricultural departments for the control of rodents is of paramount importance. The rat population is roughly 3000 millions in India and there is 2000 crores of rupees annual loss due to rats. Other hosts are dogs, cows, buffaloes, sheep, rabbits etc.

Source of human infection is mainly water, food and soil contaminated with the urine of infected animals. There are 2 modes of infection:

1. Direct- Due to contact with animal tissue, urine, body fluids especially occupational exposure in abattoirs and agricultural field workers.
2. Indirect- Environment contaminated with urine and other dis-charges of the host especially in water and soil.

Human to human transmission is rare. The incubation period in animals is 2 to 20 days and humans is 4 to 14 days.

CLINICAL FEATURES

In humans the infection can cause a wide range of symptoms. Some infected people maybe asymptomatic. Leptospirosis is a biphasic disease that begins with flu like symptoms. After the resolution of the first phase the patient remains asymptomatic till the beginning of the second phase. This is characterized by meningitis, liver damage and renal failure. The importance of the wide range of symptoms is that the infection is often wrongly diagnosed.

CONTROL

A. Case Management

1. Early treatment with suitable antibiotic
2. Monitoring and supportive care like dialysis etc.

B. Prevention

1. Identifying the source of infection
2. Water management and treatment of water with bleaching powder @ 100 gm/ 5 litres etc.
3. Control of rodents
   a. Trapping especially WHO designed Wonder trap
   b. Using rodenticides such as warfarin, arsenous oxide, barium carbonate. Barium carbonate engenders thirst and rats frantically visit all water sources including swimming pools to quench thirst.

C. Fumigation

1. Treatment of dogs, cattle etc.
2. Personal protection such as wearing gloves and gum boots which are not currently feasible in India.

END NOTE

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