



LEPTOSPIROSIS – A DECEPTIVE YET NEGLECTED MALADY

Dr PMP Singh

DADH, HQ 41 Artillery Division C/o 56 APO

Dr MS Mustafa*

ADH, HQ 17 Corps C/0 99 APO*Corresponding Author

ABSTRACT

Background: Armed Forces personnel are at increased risk of contracting leptospirosis during relief work following floods and other natural disasters. Because of lack of awareness of the disease, leptospirosis has acquired the ominous status of a "neglected disease." **Materials and methods:** Two cases of leptospirosis reporting to two different service hospitals located in the southern part of the country are reported here. Both cases were admitted and subjected to detailed epidemiological investigation. While the first case succumbed to his illness despite intensive management, the second case had a mild illness and was discharged after treatment. **Results:** **Case 1** This 52 yrs old male ex-serviceman presented with a history of high grade fever with chills and rigors of 4 - 5 days duration. Test for IgM antibodies for leptospirosis was positive. He finally expired due to multi-organ dysfunction on the eighth day following admission. **Case 2** A 22 year old wife of a sailor, presented with high grade fever, bodyache and sore throat of one week duration. She was positive for Microscopic Slide Agglutination Test (MSAT) and Microscopic Agglutination Test (MAT) using paired acute and convalescent phase sera; which showed a four-fold rise in antibody titre. She did not develop any complications and was discharged following a course of tab Doxycycline 100 mg BD for 05 days. **Conclusion:** Troops deployed in disaster affected areas also constitute a high-risk group. Flooding after torrential rains is remarkably favourable for leptospirosis. As seen in the above two cases, the clinical signs and symptoms are highly variable and may range from subclinical to fulminant and potentially fatal manifestations. If untreated, the mortality rates may be high in severe cases.

KEYWORDS :

Introduction

Leptospirosis is an anthro-zoonotic disease caused by pathogenic spirochaetes of the genus *Leptospira* and transmitted to man under certain environmental conditions like floods, cyclones and other natural calamities. It is believed to be the most prevalent zoonosis across the globe. In a multi-centric study in India, 12.7% of cases of acute febrile illness reporting to hospitals were attributed to leptospirosis. Armed Forces personnel are at increased risk of contracting leptospirosis during relief work following floods and other natural disasters.

The disease may pass off unnoticed and under-reported at times due to a wide range of signs and symptoms and difficulty in establishing a confirmatory laboratory diagnosis; especially in peripheral settings. Because of lack of awareness of the disease, inadequate epidemiological data, and unavailability of appropriate laboratory diagnostic facilities in most parts of the world, leptospirosis has acquired the ominous status of a "neglected disease."³

Materials and methods

Two cases of leptospirosis reporting to two different service hospitals located in the southern part of the country are reported here. Both cases were admitted and subjected to detailed epidemiological investigation including history regarding personal information, presenting symptoms, time of onset of symptoms, medical care provided and time taken for the outcome in terms of recovery or death. As the two cases presented differently, they were managed based on their clinical presentation. While the first case succumbed to his illness despite intensive management, the second case had a mild illness and was discharged after treatment.

Assessment of the clinico-epidemiological profile of the cases led to the incrimination of leptospirosis as the causative agent. A confirmed case was therefore defined as one presenting with acute febrile illness and positive laboratory test for leptospirosis.

Results

Case 1

This 52 yrs old male ex-serviceman presented with a history of high grade fever with chills and rigors of 4 - 5 days duration.

He had reduced urine output since the last two days and became anuric at the time of reporting. He had hypotension and tachypnoea with deep icterus, pallor, pedal edema and bleeding from all intravenous sites. Systemic examination showed epigastric tenderness with bilateral basal crackles in chest. Investigation showed low platelet counts (10,000/cumm) with hyperbilirubinemia (serum bilirubin - 17.3 mg/dl), raised SGOT/SGPT (108/41 IU/L), and azotemia (BUN - 69mg/dl; serum creatinine - 4.9 mg/dl). Tests for malarial parasite and all viral markers like HBV, HCV, HAV, HEV & Dengue were negative. Test for IgM antibodies for leptospirosis was positive.

The case was intubated and mechanically ventilated due to poor sensorium (E1V1M2). He was started on peritoneal dialysis, but as he did not respond to same, he was taken up for hemodialysis. His further course was complicated with development of aspiration pneumonia, progressively rising serum bilirubin and azotaemia with dyselectrolytemia. He finally expired due to multi-organ dysfunction on the eighth day following admission. Retrospective history taken from the relatives of the deceased revealed that he was a farmer, and worked in his paddy field.

Case 2

A 22 year old wife of a sailor, residing in a metropolitan city in South India presented with high grade fever, bodyache and sore throat of one week duration. She was negative for malaria, dengue and typhoid. Although she was negative for IgM antibodies for *Leptospira* and dark field microscopy, she turned out to be positive for Microscopic Slide Agglutination Test (MSAT) and Microscopic Agglutination Test (MAT) using paired acute and convalescent phase sera; which showed a four-fold rise in antibody titre. She did not develop any complications and was discharged following a course of tab Doxycycline 100 mg BD for 05 days. History revealed that the patient had to often wade through knee-deep water post-floods on three successive days to purchase household items; about one week before the onset of symptoms.

Discussion

Leptospirosis is endemic in humid subtropical and tropical climates. The disease is prevalent in areas experiencing

heavy monsoons coupled with animal rearing and unplanned urbanisation. It is an occupational hazard for farmers, sewage workers and butchers. Troops deployed in disaster affected areas also constitute a high-risk group. One of the two cases described here was a farmer. An Iranian study found farming as the major (60%) occupation among infected patients. The reason for increased risk of infection in farmers is the heavy use of fertilizers for agriculture, which makes the pH of the water alkaline, thereby making the environment conducive for survival and propagation of *Leptospira*.⁶

In endemic regions, the disease generally propagates in the community as an asymptomatic or mild illness. It flares up as outbreaks primarily during natural calamities where hygiene and sanitation standards get compromised due to time and space constraints. Humans are accidental dead-end hosts and usually become infected through direct or indirect exposure to the urine of infected animals such as rodents, dogs and cattle.⁷ Flooding after torrential rains is remarkably favourable for leptospirosis.⁸ As flooding prevents animal urine from being absorbed into the soil and evaporating, it allows *Leptospira* to persist for prolonged duration in the surface water.⁸ Continued exposure of the skin to contaminated water therefore provides an excellent opportunity for invasion by leptospires.

As seen in the above two cases, the clinical signs and symptoms are highly variable and may range from subclinical to fulminant and potentially fatal manifestations.⁹ If untreated, the mortality rates may be high in severe cases. Timely diagnosis is crucial as antibiotic therapy provides greatest benefit when initiated early.¹⁰ Hence, it is imperative that Leptospirosis should also be considered in the differential diagnosis of acute febrile illnesses of unknown origin.

In the second case both MSAT and MAT were positive. Paired sera should be taken for confirmation of the diagnosis; as a single high titre may be false positive due to previous infection. A four-fold rise in antibody titres in paired sera samples is confirmatory.¹¹

However, serology using MAT has the disadvantage that the sample may turn out to be negative in the early phase of the infection, when antibodies have not yet been formed. Hence, in the early phase, confirmation is done by real-time polymerase chain reaction (RT - PCR) assays.¹² However, RT - PCR may not be available in poor resource settings where cases of leptospirosis are common.

As troops involved in flood relief operations are at high risk of contracting leptospiral infection, they must be briefed about preventive aspects before deployment. Walking through dirty water should be avoided as far as possible. If the same is inevitable, protective gear in the form of gumboots, rubber gloves and full sleeves clothes should be worn when wading through water logged areas to prevent man - pathogen contact. Wounds, cuts or abrasions should be well covered and bandaged.

Improvement in sanitation and hygiene of the camping area helps in preventing spread of the disease. Domestic animals should be kept separately and handled carefully. Proper disposal of wastes should be ensured. Troops should be cautioned to avoid swimming in infected pools and ponds.

As leptospirosis has great potential for causing outbreaks, disease surveillance measures should be put in place. Medical Officers should maintain a high index of suspicion of leptospirosis in floods and other natural disasters; as timely recognition may make the difference between recovery and fulminant or fatal outcome. Information Education and

Communication (IEC) activities for troops regarding preventive measures should be undertaken by medical officers. Regular training and retraining of medical officers in their role of trainers is therefore of paramount importance. Since timely treatment may make the difference between life and death, the treating physician should not wait for the laboratory results and start empirical antibiotic therapy forthwith. In suspected outbreaks, an attempt should be made to identify the source of infection and environmental measures should be implemented immediately. The mapping of water bodies and human activities in water logged areas should be done.

We must reconcile with the fact that leptospirosis cannot be eradicated; keeping in view the large variety of serovars, multiple sources of infection and non-availability of a potent vaccine. However, meticulous rodent control measures and improvement in sewerage and drainage facilities will go a long way in outbreak mitigation.

Conflicts of Interest

Nil

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