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Leptospirosis in Sri Lanka: diagnostic dilemmas and management gaps in an endemic landscape

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The recent outbreak of leptospirosis in the Jaffna district, Sri Lanka has prompted us to write this editorial highlighting the ongoing public health challenge posed by this neglected tropical disease. Leptospirosis was first confirmed in Sri Lanka in 1959 and designated a notifiable disease in 1991.[1] Since then, a steady increase in reported cases has been observed, marked by several significant outbreaks. Notably, in 2008, Sri Lanka experienced a large outbreak, with an estimated incidence of 371 cases per 100,000 population. Subsequent outbreaks in 2009 and 2010 reported 4,968 cases with 141 deaths and 4,554 cases with 122 deaths, respectively.[2] A rise in the leptospirosis cases and deaths was seen in the past few years, with the year 2024 reporting the highest case load to-date.[3] The number of cases surpassed 13,000 and the case fatality rate remains at a staggering 2 per 100 cases.

Against the backdrop of rising case numbers nationwide, the emergence of leptospirosis in typically low-prevalence areas such as Jaffna has appeared as an unexpected challenge for healthcare workers. The alarming number of deaths and cases in Jaffna triggered a national response and the source of the outbreak was identified as a marshy area, frequented by farm animals that flooded during the rain. While dengue hogs the limelight of the country, leptospirosis remains a significant endemic threat in Sri Lanka, with an estimated annual incidence of 300 (95% CI 96.54-604.23) per 100,000 people.[3]

These emerging trends highlight the urgent need to have a routine surveillance mechanism of reservoir animals, enhance diagnostic infrastructure, overcome physician inertia and promote clinical vigilance to ensure timely identification and management of leptospirosis. However, the country continues to struggle with diagnostic uncertainty and therapeutic challenges which hamper timely management leading to preventable morbidity and mortality.[4]

One of the major barriers to effectively tackling leptospirosis in Sri Lanka is the lack of reliable diagnostic tools. In the absence of point of care diagnostic facilities, reliance is placed on clinical features and exposure history for provisional diagnosis. As the disease has a wide spectrum of clinical manifestations, ranging from mild flu like illness to severe multi organ dysfunction syndrome (MODS), the clinical diagnosis is always challenging. Furthermore, leptospirosis often mimics other diseases such as dengue, hanta virus, rickettsiosis and sepsis, making accurate clinical diagnosis difficult. Thus, under-diagnosis and misdiagnosis of the disease is inevitable.[6,7]

In current practice, laboratory confirmation of leptospirosis is based on the reference standard microscopic agglutination test (MAT), DNA detection by polymerase chain reaction (PCR) amplification, direct demonstration of the organism, and isolation by culture. Although MAT is widely regarded as the gold standard, its availability is limited in Sri Lanka. It is only performed at the Medical Research Institute (MRI) in Colombo, significantly limiting timely access, especially for physicians in peripheral and rural settings with the highest disease burden. This limited accessibility of diagnostics remains a major obstacle

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in the management of leptospirosis, often delaying the diagnosis and contributing to poorer outcomes.

Moreover, MAT tests for both IgM and IgG antibodies, making it less adept at differentiating acute from past illness. MAT is more useful retrospectively than for early diagnosis and the cut-off titer considered for diagnosis of acute leptospirosis varies widely, limiting its clinical utility.[8,9] While PCR provides an early and highly specific detection of Leptospira DNA, its availability is largely restricted to the research setting. Sri Lanka has successfully scaled up the PCR capacity during the COVID-19 pandemic. Thus, the leverage of the same infrastructure for this endemic disease should be sorted out urgently. Additionally, point of care antigen tests play a crucial role in early diagnosis, especially in resource-limited settings. However, the cost and inconsistent performance remain the main barriers to these rapid diagnostics. Addressing these diagnostic gaps is essential, not only to empower physicians, but also to reduce the mortality and morbidity associated with this treatable and preventable disease.

Further complicating the picture is underreporting and misdiagnosis. Significant year-to-year variation in reported cases observed in surveillance data from the Ministry of Health reflects the challenge of accurate diagnosis of the disease rather than actual changes in incidence.[10] Clinical overlap with dengue, which is widely feared, often leads to misclassification and mismanagement. This diagnostic dilemma contributes to delays in initiating appropriate antimicrobial therapy, particularly in co-endemic areas, leading to increased morbidity and mortality due to the disease.[2]

From a management perspective, resource constraints and the lack of standardized protocols remain key barriers. Many peripheral hospitals lack the capacity for detection, intensive monitoring and management of complications of severe leptospirosis, such as acute kidney injury, myocarditis, and pulmonary hemorrhage.[2]

Pulmonary haemorrhage in leptospirosis is associated with high mortality. Management of leptospirosis pulmonary haemorrhage syndrome (LPHS) remains an unsolved clinical dilemma to date. The available diagnostic methods such as chest X-ray, spirometry, bronchoscopy, and HRCT are insufficiently sensitive, specific, or timely.[11] This problem is compounded by the fact that there is no definitive treatment for LPHS. Evidence is rather unclear for the existing treatment modalities such as intravenous steroids and plasmapheresis.[12,13] Thus, managing patients with complicated disease poses a significant challenge at present.

Moreover, limited public awareness and inadequate preventive strategies have significantly hindered control efforts. Although chemoprophylaxis with doxycycline is recommended for high-risk exposures, especially for farmers and those affected during flooding, there seems to be a noticeable void in adhering to chemoprophylaxis.[14] Many people from non-agricultural occupations, such as office workers and three-wheel drivers participate in farming activities during harvesting seasons. As they are not regular farmers, they often do not receive or take doxycycline prophylaxis. Further, it is observed that leptospirosis risk is expanding beyond traditional occupational exposures in Sri Lanka. Outbreaks have been documented in the ecotourism sector, indicating the need for broader and more sustained implementation of preventive measures, particularly targeting vulnerable populations in endemic districts.[2,15]

Leptospirosis is not a new threat to Sri Lanka, but it remains a neglected disease of poverty. It has not yet been listed as a neglected tropical disease by the World Health Organization (WHO), which further hampers global interest. Tackling this preventable disease demands not only improved diagnostics and management but also sustained efforts in environmental control, occupational safety, and public health education. It is only through a coherent and consistent approach by adhering to simple principles and focusing on the fundamentals, that we can hope to reduce the avoidable morbidity and mortality associated with leptospirosis.

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