

Leptospirosis and dengue co-infection in a Brazilian Amazon patient

Coinfecção por leptospirose e dengue em um paciente da Amazônia brasileira

Coinfección por leptospirosis y dengue en un paciente de la Amazonía brasileña

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ABSTRACT

Leptospirosis and dengue are two major urban health problems associated with high mortality. Acute co-infection with leptospirosis and dengue is an extremely rare event. The aim of the present report is to describe the first case of leptospirosis and dengue co-infection in a patient from the Brazilian eastern Amazonia.

Keywords: Leptospirosis; Dengue; Communicable Diseases; Enzyme-Linked Immunosorbent Assay.

INTRODUCTION

Leptospirosis and dengue are infectious diseases of global importance and are two of the many medical conditions responsible for undifferentiated febrile illness, especially in tropical and subtropical regions^{1,2,3,4}. The annual incidence of leptospirosis is estimated to range from 0.1-1.0 per 100,000 in temperate climates to 10-100 per 100,000 in the humid tropics, and incidences greater than 100 per 100,000 are encountered during outbreaks and in high-exposure-risk groups⁵. Dengue fever is endemic in most tropical and subtropical areas of the world, and in 2007, nearly 1 million cases were reported in the Americas alone⁶. Additionally, dengue viruses have been found to be the most common arbovirus infections in western South America, accounting for 26% of febrile episodes⁷. However, leptospirosis and dengue co-infection is an extremely rare event, with only five cases previously reported in the English medical literature^{8,9,10,11}.

The aim of the present report is to describe the first case of leptospirosis and dengue co-infection in a patient from the Brazilian eastern Amazonia.

CASE REPORT

A previously healthy 41-year-old Brazilian Amazon man, a resident of a region in which rodents and insects are common, was admitted with a five-day history of high fever (41°C); abdominal pain; nausea; non-bilious and non-projectile vomiting; chills; arthralgia; intense myalgias, especially in the inferior extremities; and anorexia. There was no indication of bleeding from any site. The patient's past medical history was unremarkable. On physical examination, the patient was febrile and dehydrated and had an erythematous rash all over the body. The liver was palpable 3 cm below the right costal margin, and the spleen was palpable 1.5 cm below the left costal margin. Laboratory analysis revealed that serum electrolytes and kidney function were normal. Routine hematological investigations showed 13,400 white blood cells/mm³ and 119,000 platelets/mm³. Liver tests showed alkaline phosphatase 531 U/L (normal 30-250), GGT 221 U/L (normal 15-90), AST 1432 U/L, and ALT 521 U/L. Electrocardiogram and chest x-ray were both within normal limits. The patient was managed symptomatically. Further investigations were directed to establish the specific etiology. A peripheral blood smear for malaria and a Widal test for enteric fever were negative. Serologic testing for hepatitis A, B and C and HIV was negative. Tube agglutination and ELISA-IgM serology for *Leptospira* were positive. Dengue IgM capture ELISA (MAC-ELISA) was also positive and confirmed acute infection by dengue virus type 1. The patient was maintained with medical support, and his condition improved. He was discharged 21 days after admission, at which time he was asymptomatic.

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DISCUSSION

Leptospirosis and dengue are two infectious diseases of global importance and are two of the many medical conditions responsible for undifferentiated febrile illness, especially in tropical and subtropical regions^{1,2,3,4}. Latin America, and particularly the Brazilian Amazon, represents an endemic region for these two infectious diseases due to the geographic and climatic aspects of the region and the socioeconomic characteristics of its population^{12,13,14,15}.

Leptospirosis is a worldwide zoonotic disease caused by pathogenic leptospires belonging to the genus *Leptospira*; this disease affects predominantly men. Its annual incidence is estimated to range from 0.1-1.0 per 100,000 in temperate climates to 10-100 per 100,000 in the humid tropics, and incidences of more than 100 per 100,000 are encountered during outbreaks and in high-exposure-risk groups⁵. Dengue is an arbovirus-associated disease and is by far the most common arthropod-borne viral infectious disease responsible for human febrile illness in Latin America^{7,14,15}. In the last ten years, Brazil has accounted for nearly 70% of reported dengue fever cases in the Americas and has seen a 45-fold increase in the incidence of dengue from 2000 to 2002¹⁶. Although leptospirosis and dengue are commonly seen in regions with poor socioeconomic

conditions, such as some locations in the Brazilian eastern Amazonia, co-infection with these two pathogens is an extremely rare event, with only five cases previously reported in the English medical literature^{8,9,10,11}.

The vast overlapping spectrum of symptomatic manifestations of dengue and leptospirosis makes the clinical diagnosis challenging for treating physicians when acute co-infection is present. According to Kaur and John¹⁰, in such cases, when undifferentiated fever is the main symptom observed, the only way to establish a specific diagnosis and rule out other infectious diseases is by serologic testing. Oliveira et al¹⁷ demonstrated that many patients presenting with clinical symptoms of dengue are found to be positive for *Leptospira* sp. based on laboratory tests.

CONCLUSION

In conclusion, the present report reinforces the fact that leptospirosis and dengue are two important endemic infectious diseases in the Amazon region and have a similar clinical presentation. Therefore, laboratory testing is an important diagnostic tool and must be initiated as soon as clinical suspicion of both diseases is raised.



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RESUMO

Leptospirose e dengue são dois dos principais problemas de saúde pública associados a altas taxas de mortalidade. A coinfeção aguda por leptospirose e dengue é extremamente rara. O objetivo deste relato é descrever o primeiro caso de coinfeção por leptospirose e dengue em um paciente originário da Amazônia oriental brasileira.

Palavras-chave: Leptospirosis; Dengue; Doenças Transmissíveis; ELISA.

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RESUMEN

Leptospirosis y dengue son dos de los principales problemas de salud pública asociados a altas tasas de mortalidad. La coinfección aguda por leptospirosis y dengue es extremadamente rara. El objetivo de este relato es el de describir el primer caso de coinfección por leptospirosis y dengue en un paciente oriundo de la Amazonía oriental brasileña.

Palabras clave: Leptospirose; Dengue; Enfermedades Transmisibles; Prueba ELISA.



REFERENCES

- Slack A. Leptospirosis. Aust Fam Physician. 2010 Jul;39(7):495-8.
- Victoriano AF, Smythe LD, Gloriani-Barzaga N, Cavinta LL, Kasai T, Limpakarnjanarat K, et al. Leptospirosis in the Asia Pacific region. BMC Infect Dis. 2009 Sep;9:147.
- Thai KT, Cazelles B, Nguyen NV, Simmons CP, Boni MF, Farrar J, et al. Dengue dynamics in Binh Thuan province, southern Vietnam: periodicity, synchronicity and climate variability. PLoS Negl Trop Dis. 2010 Jul;4(7):e747.
- Guedes DR, Cordeiro MT, Magalhaes T, Marques E, Regis L, Furtado AF, et al. Patient-based dengue virus surveillance in *Aedes aegypti* from Recife, Brazil. J Vector Borne Dis. 2010 Jun;47(2):67-75.
- World Health Organization. Human leptospirosis: guidance for diagnosis, surveillance and control. Geneva: World Health Organization; 2003.
- Centers for Disease Control and Prevention. Travel-associated Dengue surveillance - United States, 2006-2008. MMWR Morb Mortal Wkly Rep. 2010 Jun;59(23):715-9.

- 7 Forshey BM, Guevara C, Laguna-Torres VA, Gianella A, Vallejo E, Madrid C, et al. Arboviral etiologies of acute febrile illnesses in Western South America, 2000-2007. *PLoS Negl Trop Dis*. 2010 Aug;4(8): e787.
- 8 Levett PN, Branch SL, Edwards CN. Detection of dengue infection in patients investigated for leptospirosis in Barbados. *Am J Trop Med Hyg*. 2000 Jan;62(1):112-4.
- 9 Rele MC, Rasal A, Deshpande SD, Koppikar GV, Lahiri KR. Mixed infection due to *Leptospira* and Dengue in a patient with pyrexia. *Indian J Med Microbiol*. 2001 Oct-Dec;19(4):206-7.
- 10 Kaur H, John M. Mixed infection due to leptospira and dengue. *Indian J Gastroenterol*. 2002 Sep-Oct;21(5):206.
- 11 Behera B, Chaudhry R, Pandey A, Gupta E, Broor S, Aggarwal P, et al. Co-infections due to leptospira, dengue and hepatitis E: a diagnostic challenge. *J Infect Dev Ctries*. 2009 Nov;4(1):48-50.
- 12 Pappas G, Papadimitriou P, Siozopoulou V, Christou L, Akritidis N. The globalization of leptospirosis: worldwide incidence trends. *Int J Infect Dis*. 2008 Jul;12(4):351-7.
- 13 Lomar AV, Diament D, Torres JR. Leptospirosis in Latin America. *Infect Dis Clin North Am*. 2000 Mar;14(1):23-39, vii-viii.
- 14 Tapia-Conyer R, Méndez-Galván JF, Gallardo-Rincón H. The growing burden of dengue in Latin America. *J Clin Virol*. 2009 Oct;46 Suppl 2:S3-6.
- 15 Flauzino RF, Souza-Santos R, Oliveira RM. Dengue, geoprocessing, and socioeconomic and environmental indicators: a review. *Rev Panam Salud Publica*. 2009 May;25(5):456-61.
- 16 Torres JR, Castro J. The health and economic impact of dengue in Latin America. *Cad Saude Publica*. 2007;23 Suppl 1:S23-31.
- 17 Oliveira ACA. Detecção de *Leptospira* sp no sangue periférico de indivíduos com suspeita de dengue, em Fortaleza, no ano de 2008-2010. *Rev Bras Med Trop*. 2010;23 supl 1:241.

Recebido em / Received / Recibido en: 15/11/2010
Aceito em / Accepted / Aceito en: 20/12/2010