Leptospirosis: An Endemic Zoonosis in Brazil

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Rapid Communication

Leptospirosis is one of the emerging zoonoses worldwide, especially in Brazil and has a great impact on public health. The etiological agent of leptospirosis is a spirochete, member of the Leptospiraceae family, genus Leptospira, which survives in nature and in many types of environmental reservoirs (wet or humid), as well as in the renal tubules of rodents, sheep, goats and bovines, as well as in domestic animals [1,2]. Transmission occurs after the bacteria penetrate the human skin (mucous membranes and even intact skin) when in contact with contaminated water, mainly for long periods of exposure [3,4].

The disease occurs especially in humid tropical regions, mainly due to climatic conditions that favor microorganism maintenance in the environment. The incidence is 10-100/100,000 inhabitants in the humid tropics and more than 100/100,000 inhabitants during outbreaks and in groups at high risk of exposure [5]. Leptospirosis lethality varies in Brazil, being approximately 7.5%, with an incidence in the same period of 2.1/100,000 inhabitants [6].

Brazilian epidemiological data are poorly detailed, despite the compulsory notification and, generally do not depict the reality of the sites due to underdiagnosis (cases with oligosymptomatic clinical picture that are self-limited and do not seek medical care) and underreporting of the disease. Leptospirosis may account for 20-40% of febrile diseases of unknown origin [5]. Most (non-specific) clinical signs and symptoms are: fever, headache, myalgias, abdominal pain, anorexia, conjunctivitis, exanthema, and even meningitis. Approximately 5-15% of patients develop characteristics of the severe form the disease, known as Weil’s disease (jaundice, hemorrhage and acute kidney injury) [7,8]. The main differential diagnoses are: dengue fever, malaria, hantavirus, acute infection with the HIV virus, zika, chikungunya, acute Chagas’ disease, yellow fever, Brazilian spotted fever and influenza [4,9,10].
To optimize the clinical diagnosis, the local epidemiological reality must be considered, because despite the lack of strong evidence for antimicrobial therapy use, there is a tendency towards decrease in symptom duration and severity in the group of treated patients and thus, after the presumptive diagnosis, the early implementation of the antibiotic therapy is recommended [11-13]. The only sensitive and specific test in the acute phase of the disease is the polymerase-chain reaction. The microagglutination test is the reference method, which can be considered the gold standard, and is widely disseminated in the public health system [4,14].

Urban communities without access to adequate basic sanitation and water treatment services, people living in floodplains of rivers and lakes, as well as rural agricultural communities working with irrigated rice, soy, tobacco, corn, wheat and sugar cane fields are at risk of acquiring the disease. Moreover, the inhabited regions of river basins, a Brazilian characteristic, are vulnerable to floods that add risks and cause outbreaks with possible epidemic characteristics [9].

Currently, individuals traveling to endemic areas, involved in adventure sports and ecotourism, are exposed to several infectious agents present in the environment, and constitute an increasing group of cases worldwide [1]. It is important to emphasize that leptospirosis is an occupational disease for veterinarians, farmers, slaughterhouse workers, rodent control workers, and other occupations that require contact with vectors [3,15].

The aim of this study was to determine the epidemiology of leptospirosis cases that required in-hospital medical care to obtain a profile of the cases and thus support the early diagnosis of suspected cases.

A retrospective cohort study was carried out, using the medical records of the Information System of Disease Notification of the Ministry of Health of Brazil, related to individuals treated at Hospital, state of Rio Grande do Sul, Brazil. Published data were authorized for publication by municipal health surveillance. The inclusion criterion was the confirmed leptospirosis serological test (2 samples), from January 2009 to December 2014. The variables analyzed were: gender, age, origin (rural and urban area), hospital length of stay, mean hospital length of stay, need for intensive care unit admission, mortality rate, direct or indirect contact with rodents, tending livestock, contact with natural fluids, wasteland, garbage/rubble, and grain storage, working with crops, as well as signs and symptoms of the disease. The serological method used was the microagglutination test (standardized by the state central laboratory). The analyzed data were tabulated and analyzed using the Statistical Package for Social Sciences version 22.0.

A total of 213 cases of leptospirosis were identified in the period. The mean overall incidence was 36.7%, ranging from a minimum of 32.4% to a maximum of 44.5%. There was a predominance of males (82.2%) and an overall mean age of 41.7 (±18) years, ranging from 7 to 77 years, in agreement with known trends [10]. The origin of the affected patients in this study was the urban area, in 124 (58.2%) cases. This result confirms the association of diverse living conditions and occupational and recreational activities of the population [8].

Hospital admission was necessary in 158 patients (74.2%), with a mean hospitalization time of 4.2 (± 8.7) days, showing a clinical presentation with signs of severity that indicated in-hospital stay. The signs and symptoms of the patients analyzed in the study are described in Table (1). The clinical form called Weil's disease was observed in 17 (8.0%) patients, requiring hospitalization in an intensive care unit. The overall indication of intensive care was observed in 19 (12.0%) cases. Weil's disease lethality was 29.4%. The overall mortality in the study was 2.3%. Brazilian data show that the overall mortality rate is approximately 10.0% [4]. Of the clinical manifestations, we emphasize that jaundice was present in 42.7% of the cases, indicating that the clinical-epidemiological diagnosis was essential for disease suspicion and confirmation.

The analysis of the risk situation showed the following risk factors in confirmed cases: direct or indirect contact with rodents (78.5%), tending livestock (74.8%), contact with natural fluids (58.9%), wasteland (47.7%), garbage/rubble (30.0%) and grain storage (39.3%) and working with crops (46.3%).

It was observed that contact with socioeconomic and occupational and recreational activities of the population was more important than housing alone, which did not modify the almost unanimous pattern of the most affected population, young adult males. Due to the wide possibility of differential diagnoses, attention is required regarding the risk factors, to prevent underdiagnosis and underreporting. Therefore, preventive measures should be directed at improving the population's basic sanitary conditions (especially the plan for the relocation and supervision of families living in areas of risk, vector control, sanitation and garbage services structure), as well as guidelines directed at work and leisure activities.

Health promotion campaigns are always valid to provide the population with greater knowledge about this disease, as well as for early diagnosis. Vaccine immunization is a possible prevention measure, both for the human population and for reservoirs that...
transmit leptospirosis to humans, but in Brazil, it is not yet available to humans [7]. For those who will inevitably be exposed to Leptospira in endemic environments, chemoprophylaxis as primary prevention is recommended, with the use of doxycycline [8]. Few studies have focused on leptospirosis prevention, which is the main tool to fight the disease.

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