Seasonal variation and clinical and epidemiological aspects of human leptospirosis in the city of Itaperuna – RJ

ABSTRACT

Leptospirosis is a bacterial disease of global distribution and multiple presentations ranging from an unapparent process to lethal forms. The main reservoir of this anthrozoonosis, whose causing microorganism is the Leptospira sp., is a rodent associated with poor sanitation conditions. Floods and heavy rainfall are great sources that favor man’s contact with contaminated water and are directly related to seasonal higher incidence of this disease and its strong association with professional activities. This qualitative and quantitative study was conducted based on the analysis of medical records from the Epidemiological Surveillance from the Health Secretary of Itaperuna-RJ, during the months of February and March 2012, and included data from the last three years. There was no direct relationship between disease incidence and the period of flooding; the lethality rate found proved to be superior to that reported in the literature and the domestic profession was the most affected. The importance of prioritizing primary prevention is reinforced for the management of leptospirosis and prevention of new cases.

Key words: Bacterial Infections; Leptospirosis; Leptospirosis/epidemiology; Spirochaeta.

INTRODUCTION

Leptospirosis is an emerging infectious multisystemic anthrozoonosis caused by pathogenic leptospirae, characterized by broad spectrum of clinical manifesta-
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The disease is, at first, an infection in domestic and wild animals, mainly rats, dogs, cattle, and pigs. Human infection may occur directly, through infected animal urine or indirectly through contaminated water or soil. The penetration of the micro-organism occurs through broken skin or skin fully immersed for long periods on contaminated water, and through mucous membranes (mainly oral, nasal, or conjunctival).

The classic form of leptospirosis draws attention not only by the sharp toxemia but also the presence of rubenic jaundice (evidenced between the 3rd and 7th days), derived from a mixture of vascular alterations and tissue biliary impregnation. The disease is biphasic, being the first named septicemic and evidenced by high fever, chills, headache, myalgias (mainly in the calves, back, and abdomen), anorexia, nausea, and vomiting. Diarrhea and conjunctival suffusion may be present. In the second phase, also known as the immune phase, the patient usually presents the triad: rubenic jaundice, acute renal failure, and hemorrhage configuring the classic Weil syndrome. The circulation of immune complexes can cause meningism and circulatory collapse among other disorders. The duration and clinical manifestations of this phase are very variable.

The professional scope is of great relevance to the epidemiology of the disease. Some professions present increasing risk of contamination as shown in Figure 1. In developing countries, like Brazil, its occurrence is related to worsened conditions of urban life in which the human infection occurs through contact with contaminated waters or soils, especially during periods of rains and floods. This condition promotes the contamination of other groups by exposing individuals of various social and professional classes. There is no susceptibility in relation to gender when both are exposed to the sources of contagion, although it is prevalent in males.

In recent years, several outbreaks of the disease have been reported around the world, mainly in the Americas, with averages of 100 cases or more per 100 thousand inhabitants. Despite the lack of accurate data, the WHO estimates average lethality at 10%. According to the Ministry of Health, the main age group affected is from 15 to 59 years old and the main region involved is the Southeastern (37.4%), followed by the Southern (31.7%), and Northeastern (19.1%). Out of all reported cases, 86% are in urban areas, while only 11% come from the countryside.

The diagnosis must be based on clinical-laboratory and clinical-epidemiological aspects; all suspected cases must be reported to the Epidemiological Surveillance. The diagnostic confirmation is made by direct search of microorganisms in the blood or urine (leptospiremia and leptospiuria), by serological tests and isolation of the microorganism in an inoculated animal, however, the PFGE method is the gold standard for the diagnosis of leptospirosis. Treatment is based on antibiotic therapy, support measures, and, where appropriate, hospitalization in the intensive care unit and ventilatory support.

This study aims to outline the epidemiological profiles of cases of leptospirosis in the city of Itaperuna, determining their spatial and temporal distribution, in order to provide a comprehensive and up-to-date database that can complement control projects aimed at preventing the perpetuation of this disease.

**PATIENTS AND METHODS**

This study, based on the analysis of secondary data, was conducted in the city of Itaperuna, in the northwestern region of Rio de Janeiro, State of Rio de Janeiro, Brazil. Data were collected on the basis of...
the analysis of a total of 70 medical records obtained in the Central Epidemiological Surveillance from the Secretary of Health, between November of 2009 and February of 2012, being the collection period from February to March in the same year. The cases selected for the study are those who presented fever, headache, and myalgia. A spreadsheet was developed to verify the characteristics of leptospirosis cases in the municipality with the following variables: gender, age, occupation, city, area (urban or rural), clinical and epidemiological criteria, polymerase chain reaction (PCR) and ELISA – used to ratify or refute the diagnosis –, risk situations occurred in the 30 days preceding the first manifestations, and their starting dates and evolution.

RESULTS

The analysis showed that, among the 70 cases presenting symptoms suspicious of leptospirosis, the number of confirmed events was 24, which equates to 34.28% of the total. A strong prevalence was observed in males compared to females in the proportion of 15:9. In relation to age, the median found was 38 years old and the average 40.8 years old, being 66 years the oldest age and 22 years the youngest. Of these cases, only four had a rural origin (16.6%). Considering professions, six were maids (25%), followed by construction workers (16.6%), farmers, traders, and students (8.3%), and other professions (33.5%).

A cross-check of the signs and symptoms data showed fever, myalgia, and headache in all studied cases. Prostration was found in 91.7% and pain in the calf in 87.5% of patients. Vomiting was present in 66.7% and diarrhea in 50%. Other bleeding, meningism, and cardiac alterations were positive in only one case each (4.2%).

DISCUSSION

The epidemiological profile of the population affected in Brazil consists of young adults, males, resident in urban areas, and contaminated from occupational exposure.9 According to the collected data, the incidence of leptospirosis in the male population showed strong prevalence, in the proportion of 15:9, which is in line with the literature data. The findings
confirm the theoretical basis regarding the prevalence of the disease in urban areas and with low socioeconomic development in relation to other areas reaffirming the importance of anthropozoonosis as a public health problem susceptible to prevention and control.

In accordance with global accounts, the evolution to cure was the most common event; the death rate found in our study was 2.5% and greater than those reported previously. The main cause of death, as expected, was pulmonary hemorrhage.

The municipality of Itaperuna, Rio de Janeiro State, has a striking feature of seasonal rain regime. Annually, heavy rains ravage the region from December to January culminating with the flood of the Muriá River, which runs through the city, facilitating the occurrence of floods, although the highest number of cases has been found in November.

According to the collected data, the frequency of leptospirosis in Itaperuna has a sharp variation according to the rainfall. The epidemiological data, in conjunction with the clinical and laboratory data were consistent with the criteria of probability for diagnosis of leptospirosis and corroborate preliminary observations.

CONCLUSION

According to the exposed, the profile of inhabitants most susceptible to infection by Leptospira sp can be acquired and used to tailor health strategies to prevent the emergence of the disease and perform faster diagnoses and earlier interventions using these results. The importance of primary prevention in the management of leptospirosis should be prioritized as a way to prevent new cases. Effective steps could represent: garbage collection, packaging, and destination; maintenance of vacant land; adequate cleansing and disinfection of water reservoirs; construction and permanent maintenance of rainwater galleries, sewers in urban areas, in addition to reducing the risk of exposure to mud floods.

On these findings, we reaffirm the importance of this anthropozoonosis, which is preventable, and reaches the socially less favored communities.

REFERENCES

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