



Current Research in Bacteriology

ISSN 1994-5426

science
alert

ANSI*net*
an open access publisher
<http://ansinet.com>

Human Leptospirosis in Morocco 2011

¹Haraji Mohammed, ²Cohen Nozha, ³Karib Hakim, ⁴Barkia Abdelaziz, ⁴Moumni Houda, ⁵Fassouane Abdelaziz and ¹Belahsen Rekia

¹Laboratoire de Biotechnologie, Biochimie et Nutrition, Faculte des sciences d'El Jadida, Maroc

²Laboratoire de Microbiologie et d'Hygiene des Aliments et de l'Environnement Institut Pasteur Maroc, Casablanca, Maroc

³Unite HIDAOA, Departement de Pathologie et de sante Publique Veterinaire, Institut Agronomique et Veterinaire Hassan II, Rabat, Maroc

⁴Service des Maladies Epidemiques DELM, Rabat, Maroc

⁵Ecole Nationale de Commerce et de Gestion d'El Jadida, Maroc

Corresponding Author: Haraji Mohammed, Laboratoire de Biotechnologie, Biochimie et Nutrition, Faculte des Sciences d'El Jadida, Maroc

ABSTRACT

Leptospirosis is a disease caused by bacteria of the family of leptospire. This bacteria is carried by many mammals, mainly rodents. Leptospirosis may occur as small outbreaks. It represents a real public health problem in developing countries. Leptospirosis is fundamentally linked to conditions of poverty and health education activities, urbanization and social integration are the basis of its control. It is a globally important zoonotic disease that affects humans on all continents but its social distribution is uneven. Leptospirosis is more common in rural populations, especially in developing countries. It can also occur in urban populations where there is an actual increase in incidence. Its impact on public health is often difficult to determine, sometimes because of low clinical suspicion, or, as is more common, difficulty in laboratory diagnosis. Although real progress diagnostics are ongoing, the disease remains difficult to diagnose early.

Key words: Leptospirosis, zoonosis, epidemiology, Morocco

INTRODUCTION

Leptospirosis is a polymorphic disease caused by bacteria of which there are many serotypes (Faine *et al.*, 1999). Usually associated with fresh waters, leptospirosis for other work situations (Mohammed *et al.*, 2011b), particularly those in contact with animals and the polluted environment (Skardova *et al.*, 2000).

In the workplace it is often associated with work in sewers. but we must not overlook other professions in contact with animals or contaminated environment (Slack *et al.*, 2006). Similarly, if it is associated most often with rats and raccoons, you must know that all mammals can be infected to varying degrees. Leptospirosis is recognized as an occupational disease for both general and agricultural systems. Like other zoonoses, epidemiology is closely related to ecosystems: the presence of fresh water, temperature and humidity, rainfall (Bharti *et al.*, 2003). The survival of leptospire in the environment outside can last from several days to several months depending on whether these conditions are met or not (Mohammed *et al.*, 2011c; Esmaeili *et al.*, 2009). *Leptospira* infections can be asymptomatic or symptomatic depending on host susceptibility and the serovar

involved (Haraji *et al.*, 2011; Abd El Latif *et al.*, 2007). The Microscopic Agglutination Test (MAT) remains the reference serological method for diagnosis of leptospirosis with isolation providing the gold standard for definitive evidence of infection (Haraji and Belahsen, 2011; Sharma *et al.*, 2006).

The objective was to describe the current epidemiology and trends in Morocco human Leptospirosis. The results and epidemiological information are provided by DELM (Directorate of Epidemiology and Fight against Disease). Targeted and evaluated disease control programmes should be renewed.

MATERIALS AND METHODS

Patients with leptospirosis were identified according to a surveillance case definition based on the presence of conjunctival suffusion, a specific finding on physical examination for leptospirosis, Jaundice and acute renal failure (oliguria defined as urine output <500 mL/24 h, serum creatinine >2.0 mg dL⁻¹, or blood urea nitrogen >150 mg dL⁻¹).

In 2011, data on demographics (age, sex and residence), onset of symptoms and country in which infection was contracted; possible exposure risks, mortality and causes of death were evaluated by standardized questionnaires sent to local health departments for every reported case of leptospirosis.

RESULTS

Annual changes: Human leptospirosis is endemic and epidemic in some parts of the globe, the endemic nature is due to geographical and climatic conditions (OMS, 2007). Leptospirosis cases can occur either sporadically or in epidemics, with an incubation period of ~10 days. Humans are susceptible to infection with a variety of serovars. In Morocco, the impact of this year is close to the average over the last decade (Mohammed *et al.*, 2011a). The annual incidence of leptospirosis declined from 0.31/100000 in 2010 to 0.10/100000 in 2011.

Seasonal variation: The seasonal distribution of clinical cases is well known. Peaks are observed in summer and autumn (Esmaeili *et al.*, 2009), corresponding to the common names of diseases identified as leptospirosis: Fall Fever (Japan) a disease of fruit or young swineherds (Switzerland). It follows from the above that certain activities and professions, subject to direct or indirect contact with water when it is contaminated with the urine of animal reservoirs, resulting in a greater risk, particularly marked in rural areas.

Outbreaks occur during the warmest months and rainy year, especially during heavy flooding (Mohammed *et al.*, 2011b).

Seasonality of the disease is marked because, at a time, the concentration of leptospire in water and swimming habits. In Morocco, The cases reported experiencing peaks during the months of August and September.

In Morocco the peak incidence was in September between 2001 and 2010 (Mohammed *et al.*, 2011a) and in 2011, we note the appearance of a peak in July in addition to that of September (Fig. 1). Seasonality of the disease is marked because, at a time, the concentration of leptospire in water and swimming habits. In Morocco, The cases reported experiencing peaks during the months of July and September. Maximum impact extends from June to October.

Patients and disease: During 2011, the Directorate of Epidemiology and Fight against Disease (DELM) received reports of thirty three human cases of leptospirosis.

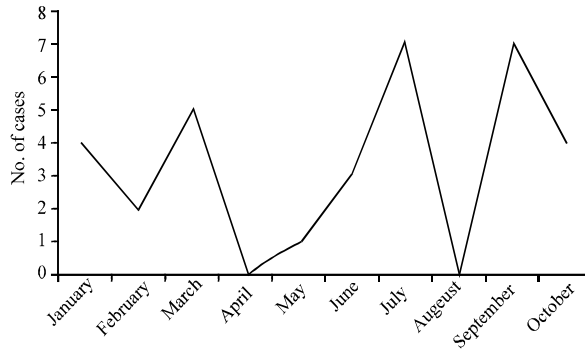


Fig. 1: Seasonal distribution of cases by months 2011

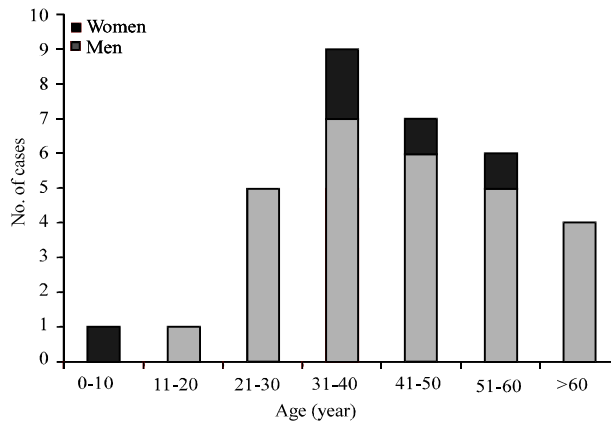


Fig. 2: Sex and age distribution of 33 cases

All 33 patients were hospitalized and six of them died from the illness, which represents 18% of cases and were aged between 41 and 60 years.

Age/sex: The severity of the infection depends on the age and general health of the patient, plus the serovar (strain) of bacteria involved and the number of bacteria that entered the patient's body.

Leptospirosis predominates in men (84.8%; 28:33) and the average age of disease onset is 42 years, data very similar to those of the previous last years (Mohammed *et al.*, 2011a). Leptospirosis cases remain concentrated among individuals aged 31-60 years (Fig. 2).

The median age of confirmed cases was 44 years; the age of cases ranged from 8 to 72 years (n = 33).

The overall sex ratio of males (n = 28) to females (n = 5) was 5.6, Among livestock farm workers, leptospirosis incidence among males (42%) was significantly greater than among females (9%) (Fig. 3).

Occupational or professional context: Occupations at risk are farmers, ranchers, hunters, farmers, veterinarians. The alluvial miners, clerks clay dams, the diggers and scavengers deserve particular scrutiny. Stray dogs also pose a risk. In the area of recreation, protection against rats in the swimming pools and feeding system has major importance.

This year, There is 16 farmer-breeders, 4 chicken seller, 2 builders, 1 cemetery worker and 10 patients had no specific professions. Sixty-seven percent of patients reported contact with animals,

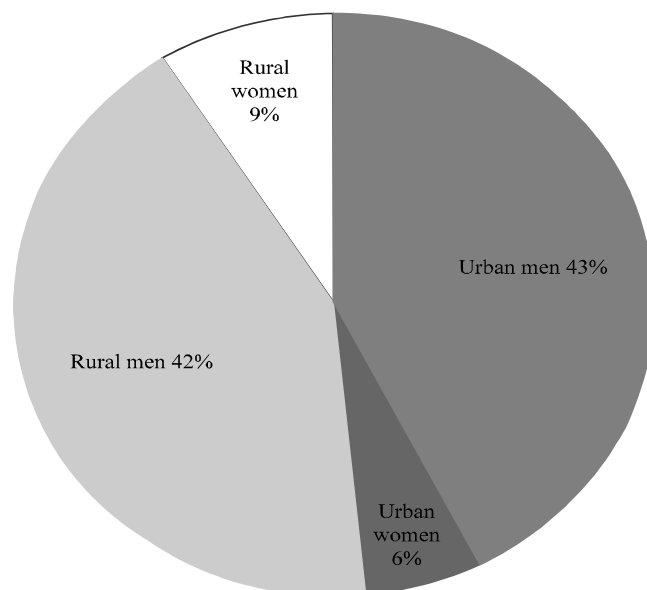


Fig. 3: Distribution of cases by sex and areas in Morocco 2011

especially rodents, rats, dogs and occasionally livestock. Fifty-eight percent had contact with freshwater.

The prognosis is generally good, overall mortality being about 4%. In case of Weil's syndrome, the mortality is 10% (Dupont *et al.*, 1997).

DISCUSSION

This year shows a relative stability of the endemic leptospirose, Morocco. The higher leptospirosis incidence among males in comparison with females in Morocco has been documented previously (Mohammed *et al.*, 2011a). The male leptospirosis incidence is sixfold that of females. Much of this difference is likely to be due to male predominance within the main occupations at risk of *leptospira* exposure.

This study suggests that the overwhelming majority of cases of leptospirosis in Morocco occur among livestock farm workers and chicken seller, as observed previously. Rates of illness among chicken seller remain very high.

Analysis of trends over the 11-year period provides some evidence that the epidemiology of leptospirosis in Morocco is changing. Although leptospirosis cases continue to be concentrated among demographic groups previously associated with high risk (in particular, young male farm workers), the predominance of these groups fell during the 11-year period. Rates among farm workers declined significantly during the study period, while rates among other occupational groups showed no significant decline. Awareness campaigns should be held to raise awareness of the disease, diagnostic tools available and their accessibility despite the geographical distance.

CONCLUSION

Contact with pets or livestock infection, leptospirosis can be family. There's there instead of thinking of leptospirosis after an accidental fall into the water and in case of flooding. It would be useful to have more extensive data on prevalence in humans and animals (Massawe and

Makundi, 2011) which is only possible with close collaboration between doctors, veterinarians, epidemiologists, bacteriologists and biologists.

REFERENCES

- Abd El Latif, M.M.S., E.M. Daoud, L.M.S Abd El Latif and N.A. El-Lithy, 2007. Urinary epidermal growth factor excretion: A useful prognostic marker for progression of renal damage in children. *J. Med. Sci.*, 7: 1171-1176.
- Bharti, A.R., J.E. Nally, J.N. Ricaldi, M.A. Matthias and M.M. Diaz *et al.*, 2003. Leptospirosis: A zoonotic disease of global importance. *Lancet Infect. Dis.*, 3: 757-771.
- Dupont, H., D. Dupont-Perdrizet, J.L. Perie, S. Zehner-Hansen, B. Jarrige and J.B. Daijardin, 1997. Leptospirosis: Prognostic factors associated with mortality. *Clin. Infect. Dis.*, 25: 720-724.
- Esmaeili, R., A. Hesamzadeh, R. Alizadeh-Navaei, M.H. Haghshenas and F. Alhani, 2009. Incidence of leptospirosis in Mazandaran province, North of Iran: A one year survey. *Pak. J. Biol. Sci.*, 12: 1330-1333.
- Faine, S., B. Adler, C. Bolin and P. Perolta, 1999. *Leptospira* and Leptospirosis. 2nd Edn., Medical Sciences, Melbourne, Australia.
- Haraji, M. and R. Belahsen, 2011. Diagnosis of human leptospirosis: Methods for detection of disease. *Technol. Lab.*, 6: 75-81.
- Haraji, M., N. Cohen, H. Karib, A. Fassouane, Y. Dinar and R. Belahsen, 2011. A new case of Weil disease confirmed in El Jadida, Morocco. *Microbiol. J.*, 1: 71-75.
- Massawe, A.W. and R.H. Makundi, 2011. The type of farming practice may affect the movement and reproduction pattern of rodents in crop fields: A case study of *Mastomys natalensis*. *J. Biol. Sci.*, 11: 22-30.
- Mohammed, H., C. Nozha, K. Hakim, F. Aziz and B. Rekia, 2011a. Epidemiology of human leptospirosis in Morocco 2001-2010. *Asian J. Epidemiol.*, 4: 17-22.
- Mohammed, H., C. Nozha, K. Hakim, F. Abdelaziz and B. Rekia, 2011b. *Leptospira*: Morphology, classification and pathogenesis. *J. Bacteriol. Parasitol.*, 2: 120-120.
- Mohammed, H., C. Nozha, K. Hakim, F. Abdelaziz and B. Rekia, 2011c. Leptospirosis: Epidemiology and usual manifestations. *Bacteriol. J.*, 1: 1-7.
- Sharma, S., P. Vijayachari, A.P. Sugunan, K. Natarajeseenivasan, M.V. Murhekar and S.C. Sehgal, 2006. Seroprevalence of leptospirosis among Jarwas-a hunter-gatherer primitive Negrito tribe of Andaman and Nicobar islands, India. *Res. J. Microbiol.*, 1: 95-100.
- Skardova, I., H. Prokopcakova, L. Cislakova, E. Sesztakova and J. Skarda, 2000. Monitoring leptospirosis affecting dogs in Eastern Slovakia. *Pak. J. Biol. Sci.*, 3: 433-435.
- Slack, A.T., M.L. Symonds, M.F. Dohnt and L.D. Mythe, 2006. Identification of pathogenic *Leptospira* species by conventional or real-time PCR and sequencing of the DNA gyrase subunit B encoding gene. *BMC Microbiol.*, 6: 95-95.