

Seroprevalence of Leptospirosis in North of Iran During 2010

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Abstract: Leptospirosis is a globally important zoonotic disease, most commonly founded in tropical or sub-tropical countries. Leptospirosis is an acute febrile illness caused by pathogenic members of the genus *Leptospira*. The present study was done to evaluate the prevalence and other variables related to Leptospirosis in Mazandaran province (north of Iran) during 2010. Blood samples were collected from all suspected cases to measure anti-leptospira antibody by Immuno-Fluorescence Antibody (IFA) method (manufactured by Pasteur Institute, Iran). During this period, incidence in men was 27.29 % and in women was 28 %. Regarding location of residence, 135(71.42%) were in rural areas and 54 (28.58%) were in urban areas. Recent studies on Leptospirosis showed that the disease was highly endemic in the animal population. It is considered that the majority of leptospirosis cases in man were due to association of man with animals and disease-infected environment.

Key words: Leptospirosis • Zoonotic • Immuno-Fluorescence Antibody (IFA) • Mazandaran • Iran

INTRODUCTION

Leptospirosis is a globally important zoonotic disease, most commonly founded in tropical or sub-tropical countries and may be prevalent in both urban and rural settings. Annual incidence is estimated from 0.1-1 per 100,000 in temperate climates to 10-100 per 100,000 in the humid tropics [1]. Leptospirosis is an acute febrile illness caused by pathogenic members of the genus *Leptospira*. This disease has a worldwide distribution but is most common in tropical regions, including north of Iran [2]. The genus *Leptospira* contains at least 18 species classified on the basis of DNA relatedness and more than 300 serovars based on agglutinating LPS antigens [3].

Approximately half of the pathogenic serovars belong to *L.interrogans* or *L.borgpetersenii*. Saprophytic species such as *L. biflexa* occurs in the environment but plays no role in disease [4].

Rodents and domestic mammals, such as cattle, pigs and dogs, serve as major reservoir hosts, but *Leptospira* has been isolated from virtually all mammalian species [5]. Infected animals may excrete leptospira intermittently or regularly for months or years, or for their lifetime [6].

Vaccinated animals may still shed infectious organisms in the urine. Human infection results from direct or indirect exposure to the urine of carrier animals. Leptospire gain entry in to the blood stream via cuts, skin abrasions or mucous membranes [7]. Leptospirosis has often been considered as an occupational disease, but recreational activities and traveling in endemic countries are also recognized as risk factors [8]. The present study was done to evaluate the prevalence and other variables related to leptospirosis in Mazandaran province (north of Iran) during 2010.

MATERIAL AND METHOD

The present study was a descriptive retrospective study of all cases of leptospirosis that diagnosed and confirmed to have the disease during 2010 in Mazandaran (north of Iran). Hospitalized cases with clinical symptoms including fever, severe headache, myalgias, conjunctival suffusion, jaundice, general malaise and joint pain as well as having positive history of working in farm or contact with animals, regarded as suspected patients of leptospirosis, by a physician in all hospitals of Mazandaran Province. The mentioned symptoms are

according to the [9] criteria. One blood samples were obtained from all suspected cases to measure anti-leptospira antibody by Immuno-Fluorescence Antibody (IFA) method with a kit manufactured by Pasteur Institute, Branch of Iran. (With antigen: *Leptospira biflexa* serovar *patoc* 1 strain in Korthof's medium) All blood samples were sent to Pasteur Leptospira Laboratory in Amol, Mazandaran, Iran. Confirmed cases had clinically compatible symptoms and at least one of the following criteria. a single anti-leptospira antibody titer greater than 1:100, a four-fold or higher increase in anti-leptospira antibody titer between the first and the second serums specimen (with at least 15 days interval), or conversion from negative titer to positive in the second versus the first serum specimen. For each confirmed case epidemiological data were obtained using a form filled out by the physician requested the laboratory test. The questionnaire included personal data (age, gender, profession and place of residence), source of drinking water, date of symptoms development and date of admission to the hospital. Data collected from these hospitals were analyzed with Z- test and SPSS statistical software.

RESULTS

During January to December 2010, 688 *Leptospirosis* suspected sera were sent to *Leptospirosis* diagnosis center in Amol city from all over Mazandaran province. 149 (27.47%) samples were diagnosed to be affected to *Leptospirosis*. During this period, incidence in men was 27.29 % and in women was 28 %; the difference was not statistically significant ($P > 0.05$).

Regarding location of residence, 135(71.42%) were in rural areas and 54 (28.58%) were in urban areas. This parameter after statistical analyses was shown to be statistically significant ($p < 0.01$) (Table 1).

Patients regarding occupational status and age were analyzed. According to occupational status, highest incidence rate was in farmers (77.77%) and according to age most patients were 41-60 years old range, that was 49.28% in male and 51.02% in female (Table 1 and Figure 1).

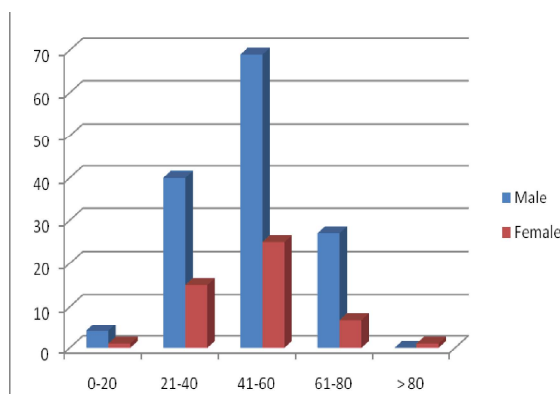


Fig. 1: Incidence Rates of Leptospirosis in Mazandaran Province according to age in male and female 2010

DISCUSSION

This study reflects all of the reported leptospirosis cases within Mazandaran Province from January to December 2010. The actual incidence of leptospirosis in the Asia Pacific region is not well-documented, similar to the situation in many regions worldwide. Aside from underreporting, incidence data are further compromised by the unavailability of laboratory diagnosis. Within the Asia Pacific region, Southeast Asia and Oceania appear to have the highest incidence of leptospirosis [10]. Major outbreaks of the disease in South-East Asia due to flooding were reported in Orissa, Jakarta and Mumbai. It has been a continuing and significant problem in the densely populated, flood-prone low lying areas of India [11, 15]. In Bangladesh and Nepal, countries with similar environmental and sanitary conditions to those in India, the problem of overcrowding also contributes to the burden of disease. A serological survey in a rural flood prone district of Bangladesh in 1994 showed 38% seropositivity in 89 samples of human sera tested, indicating that the rural population is at high risk of leptospiral infection (11, 12). In Thailand, data from disease notification reports indicated an increase in the incidence rate from less than 0.3 per 100,000 in 1995 to 23.7 in 2000, with a drop in subsequent years. The vast majority of the cases [90%] were reported in the Northeast region, primarily as a result of flooding and the emergence

Table 1: Incidence Rates of Leptospirosis in Mazandaran Province according to number of samples, gender, occupation and place of residence 2010

Samples	Number of samples		Number of patients		Number of patients based on occupational status					Place of residence	
	Male	Female	Male	Female	Farmer	Self employee	Employee	Housekeeper	Others	Urban	Rural
688	513	175	140	49	147	8	5	14	15	135	54
(100%)	(74.56%)	(25.44%)	(27.29%)	(28%)	(77.77%)	(4.23%)	(2.64%)	(7.4%)	(7.96%)	(71.42%)	(28.58%)

of a highly virulent clone. A recent seroprevalence study at a hospital on the Thai-Myanmar border revealed that 17% of patients who sought treatment for fever were diagnosed with leptospirosis [13, 14]. For the year 2008, the total number of notifications for Australia was 112 cases. This is the lowest number of reported cases in over ten years and represents a downward trend since a peak in 1999 [4]. In the North of Iran most of patients are males who live in rural area and work in rice farms and due to different tasks in farming, men are more vulnerable to skin scratches and infection than women [6, 7]. Also Mazandaran province has mild wet climate that facilitates the prevalence of leptospirosis in the region. Aim of this study was to get to know Leptospirosis in Mazandaran better and because of regional and climate condition of Mazandaran and due to incidence of this disease it is suggested that physician in Mazandaran consider Leptospirosis as one of their choices in differential diagnosis in patients who refer to them with clinical signs which can be compatible with Leptospirosis. Our study suggests that more attention is needed to be paid by medical practitioners to febrile patients specially the patients who work in farms during summer season because the probable causative agent of *Leptospira*.

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