

## The Epidemiology of *Leptospira* Infection in Mazandaran Province, Northern Iran, During 2012 - 2013

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### Dear Editor,

Leptospirosis is known as an emerging zoonotic infectious disease caused by the genus *Leptospira* (1-3). Several studies have shown that the incidence of the disease is significantly higher in tropical and subtropical areas (4-6). Some occupations, including veterinarians, rice farmers, butchers, fishermen, sewer maintenance workers, slaughterhouse workers, and laboratory staff, appear to be at higher risk for the disease (4-6). The aim of the present study was to investigate the epidemiology of leptospirosis in the Mazandaran province in northern Iran during 2012 - 2013. In this effort, 127 serum specimens were obtained from suspected individuals in different areas of the Mazandaran province during a period of eight months between November 2012 and July 2013. All 127 individuals were suspected of having leptospirosis according to physician diagnosis and the World Health Organization guidelines for diagnosis, surveillance, and control of the disease, including myalgia, neck stiffness, fever, headache, icterus, or a history of the disease prior to sampling. The 127 venous blood samples were collected in sterile tubes followed by serum separation and indirect immunofluorescence antibody assay test (IFAT) for detection of anti-*Leptospira* antibodies at the Amol research center (branch of the Pasteur institute of Iran), which is located in the Mazandaran province. Prior to sample collection, written informed consent was obtained from all of the participants. The ethical review committee of research in the Pasteur institute of Iran reviewed and approved this study. To perceive the basic pathogenic serotypes, a microscopic agglutination

test (MAT) was performed at the *Leptospira* research laboratory, faculty of veterinary medicine, University of Tehran, Tehran, Iran. All analyses were done using the user-written modules *diagt* in STATA (release 10; StataCorp LP, College Station, TX, USA); the Youden's index was also calculated. The results showed that the prevalence of leptospirosis in the Mazandaran province is 58.26%, using IFAT and MAT tests. In this survey, 74 samples, or 82.43%, that were positive belonged to males, and 17.52% were female. Rice field workers showed the most frequent incidence of the infection; among positive cases, 66.2% were rice field workers. There was a significant difference with other occupations ( $P=0.007$ ). Among rice field workers, 70% were diagnosed positive. Of male and female rice field workers, 70.96% and 62.5% were diagnosed positive, respectively. Among the 107 samples that were collected from males and 20 from females, 57% and 65% samples were positive, respectively. There was no significant difference between gender and leptospirosis ( $P > 0.05$ ). There was no significant difference between the place of residence (urban or rural) and animal contact with leptospirosis. The most positive cases were found in the age range of 41 - 50 years (25.67%). Seven common serotypes identified using MAT include ballum (16.77%), sejroe (14.29%), tarassovi (13.64%), Australis (11.69%), pyrogenes (7.79%), javanica (6.5%), and icterohaemorrhagiae (6.5%). Among all of the serotypes that were identified in this region, 81.81% and 18.19% of males and females were serologically reactive, respectively. In respect to the MAT titre of  $\geq 1:100$  as a gold standard, the sensitivity of the IFAT for the detection of *Leptospira* was 38.8%. The specificity

was 88.33%, the positive predictive value was 78.78%, and the negative predictive value was 56.38%. Esfandiari and Yousefi showed that, due to the mild, wet climate of the Mazandaran province, individuals are at a higher risk of being infected with *Leptospira* (7). In another study, Esmaeili et al. (1) demonstrated that it is necessary for medical practitioners to pay attention to leptospirosis in farmers, particularly during the summer. In conclusion, it seems that leptospirosis is a widespread occupational zoonotic disease in the Mazandaran province, and public health authorities should provide sufficient and practical guidance on prevention and control measures for this disease.

### Footnote

**Authors' Contributions:** Study design: Habibollah Faraji, Hamed Mirzaei and Hamid Reza Mirzaei; sample collection: Habibollah Faraji, Pegah Nouri, Keyvan Roshanjo and Ali Mohamadi Bardebari; manuscript writing and preparation: Hamed Mirzaei and Hamid Reza Mirzaei; serological studies: Davoud Afshar, Pegah Nouri, Keyvan Roshanjo and Ali Mohamadi Bardebari.

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