

Leptospirosis in pigs, dogs, rodents, humans, and water in an area of the Colombian tropics

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Abstract Leptospirosis is a reemerging zoonosis of global distribution and is one of the causes of hemorrhagic fevers in the tropics. We sought to determine seroprevalence in humans and animals and isolate *Leptospira interrogans* sensu lato in domestic animals, rodents, and water sources. The study was conducted in a tropical area of the middle Sinú in Cordoba, Colombia. In a prospective descriptive study, we collected blood and urine from pigs and dogs, sera from rural human workers, sera and kidney macerates of rodents, and water samples from environmental sources. We used microagglutination to screen for antibodies to 13 serovars. Strains were cultured on the Ellinghausen–McCullough–Johnson–Harris medium and confirmed by PCR amplifying *lipL32* gene. Seroprevalence was 55.9 % in pigs, 35.2 % in dogs, and 75.8 % in humans; no antibody was detected, and no *Leptospira* were isolated from kidney macerates of rodents. Seven *L. interrogans* sensu lato strains were isolated: three from pigs, two from dogs, and two from water. High seroprevalence in pigs, dogs, and humans, concomitant to isolation of strains, demonstrates that in Cordoba, transmission exists among animals, the environment, and humans, which warrants the implementation of public health intervention measures to reduce the epidemiological impact of leptospirosis in the region.

Keywords Epidemiological surveillance · Transmission · Zoonoses · Public health · Disease reservoirs · Social environment

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Introduction

Leptospirosis is a zoonosis of global distribution; it is considered a reemerging disease, endemic in tropical countries, which, because of their geoclimatic and social conditions, favor its transmission (Guerra 2013). In domestic and wild animals, chronic renal carriers maintain viable leptospires which may be excreted via urine becoming a source of infection for humans and other animals (Monahan et al. 2009). Humans can be infected with any serovar of *Leptospira* from any animal or environment, basically, through contact with fluids from infected animals (Lim 2009; Marga et al. 2013).

The organisms may enter the body via lacerations in the skin, contact with mucosa or conjunctiva, inhalation of aerosols, or ingestion of contaminated food or beverages (Monahan et al. 2009; Musso and La Scola 2013). Leptospirosis is considered an occupational disease, primarily affecting farmers, fishermen, veterinarians, and workers in sewers and slaughterhouses (Brown et al. 2011). A risk of infection for humans is the exposure during water-related recreational activities (Monahan et al. 2009; Marga et al. 2013).

The tropical environment favors survival of *Leptospira* outside reservoirs in stagnant or slowly flowing warm water. Water and soil contaminated by excreta of infected animals are also infection sources (Ganoza et al. 2006; Adler and Peña 2010). In recent years, this ecological aspect has gained importance, because of the increased incidence of exposure to contaminated environments (Vijayachary et al. 2008). Our aim was to measure the seroprevalence of *Leptospira* infection in humans and animals and isolate *Leptospira interrogans* sensu lato from animals and water sources.

Materials and methods

Type of study and geographic location We conducted a prospective, descriptive study between 2009 and 2011. The farms