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ORIGINAL ARTICLE

Clinical Epidemiological Characterization of Patients with Suspected Human Leptospirosis

Caracterización clínico epidemiológica de pacientes con leptospirosis humana sospechada

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ABSTRACT

Introduction: leptospirosis, historically considered the zoonosis of greater international diffusion.
Objective: to characterize clinically and epidemiologically the patients with suspected human leptospirosis in the Hermanos Cruz academic Polyclinic of Pinar del Río during the period 2019-2021.
Methods: an observational, descriptive and transversal study was carried out. The universe consisted of 182 patients notified by the clinics, the on-call department of the polyclinic and the hospitals. The sample was selected by simple random sampling and consisted of 162 patients. From the ethical point of view, this research complied with the ethical principles contained in the Declaration of Helsinki.
Results: in the research, the age group 40-49 predominated in 71 patients (43,83 %), with a predominance of men (76,46 %). Peasants were the most frequent with 89 cases (54,94 %). The clinical manifestations present were high fever, myalgias and arthralgias in 100 %. As epidemiological risk, rice cultivation predominated with 86 cases (53,09 %).
Conclusions: given the prevalence of patients with suspected human leptospirosis in the sample studied, the norms and procedures for better preventive control of these patients should be strengthened in primary health care, which would lead to a better polyclinic-hospital linkage and thus result in better care and a better quality of life for both the patient and the family.

Keywords: Leptospirosis; Diagnosis; Vaccines; Signs and Symptoms; Risk Factors.

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RESUMEN

Introducción: la leptospirosis es considerada históricamente la zoonosis de mayor difusión internacional.

Objetivo: caracterizar clínica y epidemiológicamente los pacientes con leptospirosis humana sospechada en el Policlínico Universitario Hermanos Cruz de Pinar del Río, durante el periodo 2019- 2021.

Métodos: se realizó un estudio observacional, descriptivo y transversal. El universo estuvo constituido por 182 pacientes notificados por los consultorios, el cuerpo de guardia del policlínico y los hospitales. Para seleccionar la muestra se aplicó un muestreo aleatorio simple, la muestra quedó conformada por 162 pacientes. Desde el punto de vista ético esta investigación respetó los fundamentos de la ética que aparecen en la Declaración de Helsinki.

Resultado: en la investigación predominó el grupo de edad de 40 - 49, en 71 pacientes (43,83 %), prevaleció en hombres (76,46 %). Son los campesinos los que aportan mayor frecuencia, con 89 casos (54,94 %). Las manifestaciones clínicas presentes están la fiebre elevada, mialgias y artralgias en el 100 %. Como riesgo epidemiológico fue el cultivo de arroz el que predominó, con 86 casos (53,09 %).

Conclusiones: ante la prevalencia de pacientes con leptospirosis humana sospechada en la muestra estudiada, se debe fortalecer las normas y procedimientos para el mejor control preventivo de estos pacientes desde la atención primaria de salud, lo que conllevaría a una mejor vinculación policlínico hospital y por ende, redundaría en una mejor atención y una mejor calidad de vida tanto para el paciente como para la familia.

Palabras clave: Leptospirosis; Diagnóstico; Vacunas; Signos y Síntomas; Factores de Riesgos.

INTRODUCTION

In the history of mankind, numerous diseases are described that have had a negative influence on the survival of mankind. Among them, leptospirosis deserves special mention, historically considered the zoonosis with the greatest international spread and which has caused the greatest damage from an economic and social point of view.[1]

Leptospirosis affects millions of people worldwide, is considered one of the "forgotten or neglected" diseases, according to the World Health Organization (WHO), and has also been associated with pulmonary hemorrhagic syndrome and with natural atmospheric disasters or environmental imbalances. This re-emerging clinical entity affects both rural and urban dwellers, in developing and industrialized countries, and has a seasonal cyclical behavior related to a "spill-over" from wild animals to domestic animals, and even a "spill-back" from domestic animals to wildlife.[2]

From the clinical point of view, leptospirosis is a disease that presents in both humans and animals a wide range of signs and symptoms that confuse it with other infectious diseases of acute course, such as dengue, malaria, among others. This clinical entity is produced by a large number of bacteria, included in the pathogenic complex Leptospira interrogans sensu lato.[3,4,5,6]

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This zoonosis, perhaps the best known in the world and, in particular, in the Americas, is classified as reemerging; a category achieved by the appearance of a large number of epidemic outbreaks attributable to multiple leptospiras serovars, which have markedly affected tropical and subtropical countries such as Nicaragua, Brazil, India, other Southeast Asian countries and the USA.[3]

In Cuba, although this nosological disease is not among the main causes of death, and in order to improve the health status of the population, the transformations in epidemiological behavior have been taken into account and this disease has been confronted since 1981 with a National Program for Prevention and Control of leptospirosis, covering both human and animal health, which has been improved since 1997, emphasizing the need to strengthen primary prevention and community participation.[4,5]

According to Cuba's Statistical Yearbook of 2019, there were 60 deaths from leptospirosis for a crude rate of 0,5 per 100,000 inhabitants in both sexes. Of these, 52 were men and 8 were women.[7]

In the province of Pinar del Río, in recent years, there has been a somewhat downward trend in the morbidity and mortality of leptospirosis; however, the prevalence of risk factors that affect the environment, taking into account climatological and environmental conditions, means that stable results have not been achieved in the reduction of the incidence rate and control of this condition, which implies offering viable alternatives from an integral and participative perspective, this generates the need to carry out the following research with the objective of clinically and epidemiologically characterizing patients with suspected human leptospirosis in the Hermanos Cruz de Pinar del Río Teaching Polyclinic during the period 2019- 2021.

METHODS

An observational, descriptive and cross-sectional study was conducted including patients with suspected human leptospirosis belonging to the Hermanos Cruz Hermanos Cruz Teaching Polyclinic of Pinar del Río, during the period from January 2019 to December 2021.

The universe was constituted by 182 patients with clinical diagnosis of suspected human leptospirosis belonging to the Hermanos Cruz Teaching Polyclinic and who were notified by the clinics and the on-call body of the polyclinic, being or not hospitalized with specific treatment. In order to select the sample, a simple random sampling was applied and it was formed by 162 patients.

The following criteria were taken into account:

Inclusion criteria.

- Patients over 19 years of age.
- Patients who were admitted with a diagnosis of suspected human leptospirosis.
- Patients who were treated at the Primary Care Level with suspected human leptospirosis.

Exclusion criteria

- Patients aged less than or equal to 19 years.

Some variables were studied such as: age, sex, skin color, occupation, clinical manifestations, epidemiological risk, means of protection (Adequate: anti-leptospirosis vaccine, prophylactic treatment (Doxycycline) and use of protective equipment and Inadequate: did not use all the control measures), time of exposure (Temporary - patients who in a period less than or equal to 6 months are exposed to the risks of the disease and permanent - patients with risks of the disease in a time greater than 6 months of exposure).

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Within the empirical methods using the procedures of: review of the information records of the zoonosis department (epidemiological surveys), Statistics department, as well as the zoonosis database of the Municipal Center of Hygiene and Epidemiology, questioning of patients and analysis of individual medical records of patients with clinical diagnosis associated with the epidemiological risk of human leptospirosis, In addition, 8 experts were interviewed (I and II Degree Specialists in Internal Medicine, Hygiene and Epidemiology, General Comprehensive Medicine, Masters in infectious diseases and Doctors of Science) to determine the risk factors related to the event.

Theoretical methods such as analysis and synthesis, historical and logical analysis, induction and deduction, as well as descriptive statistical methods were applied.

Summary measures were calculated for qualitative data (absolute frequencies and percentages). Given the non-probabilistic nature of the sample, only point estimates were computed. The results obtained are presented in tables for better understanding and analysis.

Different procedures were used to search for information: documentary review, bibliographic review in health databases.

For the realization of this research, authorization was requested to the management of the Hermanos Cruz de Pinar del Río Teaching Polyclinic. An informed consent was given to the patients who participated in the research.

From the ethical point of view, this research respected the foundations of ethics that appear in the Declaration of Helsinki and its subsequent revisions, created with the objective of establishing an ethical control of the research, by the World Medical Association (WMA), in its meeting held in Helsinki in 1964. Its essential objective is scientific, without affecting the environment or predictable risks.

RESULTS

In relation to the distribution of patients according to age and sex groups, it was observed that the age group 40 to 49 years predominated, for both sexes, with 71 patients for a total of 43.83 %, in addition to a greater representation of the male sex representing 76,46 % of the sample studied (Table 1).

Table 1. Patients with suspected human leptospirosis according to age and sex. Hermanos Cruz Teaching Polyclinic, Pinar del Río. 2019-2021

Age group (in years)	Sex				Total	
	Male		Female			
	No.	%	No.	%	No.	%
20-29	**18**	**11,11**	1	0,62	19	11,73
30-39	**33**	**20,37**	**12**	**7,41**	**45**	**27,78**
40-49	**46**	**28,40**	**25**	**15,43**	**71**	**43,83**
50-59	15	9,26	2	1,23	17	10,49
60 and more	7	4,32	3	1,85	10	6,17
Total	**119**	**73,46**	43	26,54	**162**	**100**

Source: Medical history and Registry of Obligatory Notifiable Diseases.

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It is evident that in relation to occupation, peasants are the ones who contributed the highest frequency with 89 patients (54,94 %), followed by workers in pig farms with the disease in 25 patients for 15,43 %, there is a greater number of black patients with 51,23 % (Table 2).

Table 2. Patients with suspected human leptospirosis according to skin color and occupation.

Occupation	Skin Color				Total	
	White		Black			
	No.	%	No.	%	No.	%
Farm workers	**42**	**25,93**	**47**	**29,01**	**89**	**54,94**
Sewage worker	6	3,70	5	3,09	11	6,79
Communal Workers	**8**	**4,94**	**7**	**4,32**	**15**	**9,26**
Piggery workers	**12**	**7,41**	**13**	**8,02**	**25**	**15,43**
Housekeepers	5	3,09	3	1,85	8	4,94
Others	6	3,70	8	4,94	14	8,64
Total	79	48,77	**83**	**51,3**	162	100

Source: Registry of Notifiable Diseases.

In the distribution of patients according to the most frequent clinical manifestations of human leptospirosis, it was found that high fever, myalgia and arthralgia were present in 100 % of the cases, followed by catarrhal manifestations in 118 patients, representing 72,84 % of the total number of patients studied (Table 3).

Table 3. Most frequent clinical manifestations present in patients with suspected human leptospirosis.

Clinical manifestations Patients	Patients	
	No.	%
Sustained high fever	**162**	**100**
Headache	**100**	**61,73**
Myalgias and arthralgias	**162**	**100**
Dark urine	69	42,59
Painless profuse watery diarrhea	5	3,09
Conjunctival redness	3	1,85
Yellowing of skin and mucous membranes	3	1,85
Catarrhal manifestations	**118**	**72,84**
Asthenia and anorexia	91	56,17

Source: Medical history

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According to the identification of the epidemiological risk of patients with human leptospirosis, the most frequent was the cultivation of rice with 86 cases (53,09 %) followed by the keeping of pigs and dogs with 71 and 65 patients respectively, with a percentage of little difference between them (43,83 % and 40,12 %). (Table 4).

Table 4. Identification of the epidemiological risk of patients with suspected human leptospirosis.

Epidemiologic risk	No.	%
Rice cultivation	**86**	**53,09**
Raising pigs	**71**	**43,83**
Dog keeping	**65**	**40,12**
Immersion in stagnant or slow flowing water	17	10,49
Contact with cattle, horses or goats	23	14,20
Sewer and communal workers	9	5,56
Library workers	**8**	**4,94**

Source: Medical records

In the distribution according to the use of means of protection and time of exposure of patients with suspected human leptospirosis, it was observed that 77,16 % of the cases diagnosed with suspected human leptospirosis and identified as exposed to permanent risk did not use adequate means of protection against the disease with 44,44 %. (Table 5)

Table 5: Distribution of patients with suspected human leptospirosis according to use of means of protection and time of exposure to epidemiological risk.

Time of exposure	Proteccion Means Use				Total	
	Inadequate		Adequate			
	No.	%	No.	%	No.	%
Temporary	15	9,26	22	13,58	37	22,84
Permanent	**72**	**44,44**	**53**	**32,72**	**125**	**77,16**
Total	**87**	**53,70**	75	46,30	162	100

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DISCUSSION

Leptospirosis is a disease that predominates in the male sex and most frequently affects individuals between 15 and 40 years of age - it is important to take into account its strong relationship with the occupational profile -, although it is no less true that it can occur in individuals of any age and sex since there are regions where no labor distinctions between men and women are observed,[8] which coincides with the research carried out where there was a prevalence of the male sex in the ages of 20-49 and is related to the occupational profile, most of them being farmers.

It is evident that the occupational risk is important, which derives the need to comply with occupational protection measures. Most of them carry out their work in humid and highly rodent-infested areas, so they can become infected. Other authors,[9,10] in their studies obtained similar results in relation to sex, age groups and occupational risk. In occupational exposure, farmers have more risk of infection because they are more exposed and less protected, which coincides with a research carried out by Mesa Coello L, et al.[8]

No research was found where skin color was related to the suspicion of leptospirosis, although no significant difference was found, black-skinned patients presented a higher percentage; it is considered that it is more frequent in these patients because they are more exposed to agricultural and livestock work. There are no scientific studies that support that black-skinned patients have a genetic predisposition to the disease.

The results of the research coincide with what was stated by García Portela R et al.,[11] in their study where the most frequent clinical manifestations were fever and headache. International studies,[12,13] on the subject state that the mild anicteric clinical manifestations observed in most patients are fever, headache, myalgia, arthralgia and cutaneous hyperesthesia and can reach severe icteric forms with hemorrhagic manifestations.

Among the most frequent epidemiological risks of human leptospirosis are rice cultivation, keeping animals in the home or direct contact with them, immersion in stagnant or slow-moving water for recreational swimming. Rice cultivation alone is a frequent cause of epidemiological risk and causes a high demand for health care because stagnant water has a neutral or slightly alkaline pH that facilitates the survival of pathogenic leptospira.[14]

The authors consider that leptospirosis affects risk groups that are exposed to animal reservoirs or contaminated environments, such as rice farmers, slaughterhouse or sewage workers.

The authors agree with Duany Badell L et al.,[15] in their study where patients with permanent exposure time used inadequate means of protection because they did not have gloves, waterproof rubber clothing and boots in agricultural and livestock work. Those at temporary risk were not vaccinated and did not all take doxycycline.

In view of the prevalence of patients with suspected human leptospirosis in the sample studied, the norms and procedures for better preventive control of these patients should be strengthened in primary health care, which would lead to a better polyclinic-hospital linkage and thus result in better care and a better quality of life for both the patient and the family. It is also recommended to strengthen educational programs aimed at the prevention of leptospirosis, with the active participation of the general population and the sectors involved, including the mass media and health professionals, in order to contribute to the control and reduction of leptospirosis in the population of Pinar del Río.

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Conflict of Interest
The authors declare that there is no conflict of interest.

Authorship Contribution
LYOA: participated in conceptualization, research, project management, supervision, visualization, writing - original draft, writing - revision and editing.
BRHB: participated in conceptualization, research, visualization, writing - original draft, writing - review and editing.
KPR: participated in conceptualization, research, visualization, writing - original draft, writing - review and editing.
AMCA: participated in conceptualization, research, visualization, writing - original draft, writing - review and editing.
RLA: participated in conceptualization, research, visualization, writing - original draft, writing - review and editing.

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Additional material
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