

COMPARISON OF THE PREVALENCE OF THE INFECTION BY *Leptospira* spp, *Leishmania infantum* AND *Ehrlichia canis* IN DOGS IN THE COMUNIDAD VALENCIANA (SPAIN)*

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SUMMARY : *Leptospirosis* is a contagious disease, the origin of which is a bacterium of two main types : *Leptospira interrogans* and *Leptospira biflexa*. The most important pathogens serovars in the dogs are : *Leptospira canicola* and *Leptospira icterohaemorrhagiae*. On the other hand, leishmaniosis is a parasitic disease affecting many dogs in the Mediterranean area in Spain. The last disease studied, ehrlichiosis, is a parasitic disease transmitted by ticks. These three diseases have a high rate of prevalence in our geographical area. The clinic patterns for these dogs are very different. 864 dogs were examined to know the seroprevalence and assess the relationship between these diseases in the dogs studied.

Keywords : Dog, Leishmaniosis, Ehrlichiosis, Leptospirosis, Co-infection.

RÉSUMÉ : La leptospirose canine est une maladie infectieuse due à une bactérie du genre *Leptospira* qui comprend un grand nombre d'espèces regroupées en deux entités principaux: *Leptospira interrogans* et *Leptospira biflexa*. Les sérovars pathogènes les plus fréquemment impliqués chez le chien sont *Leptospira canicola* et *Leptospira icterohaemorrhagiae*. D'autre part, la leishmaniose est une zoonose parasitaire de distribution mondiale dont le principal réservoir est le chien et qui affecte un grand nombre des chiens de la Comunidad Valenciana (Est de l'Espagne). Une autre maladie parasitaire très étendue dans cette région est l'ehrlichiose, transmise par *Rhipicephalus sanguineus*. Ces trois maladies ont une forte prévalence dans cette région et la réponse clinique est très variable chez le chien. L'objectif de ce travail était, d'une part, de connaître la séroprévalence de ces maladies dans une population de chiens (864) de différentes origines (chiens de chasse, chiens de chenils et chiens de compagnie) et, d'autre part, d'évaluer la relation éventuelle entre ces maladies chez les chiens étudiés.

Mots-clés : Chien, leishmaniose, ehrlichiose, leptospirose, co-infection.



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I - INTRODUCTION

The objective of this study is the recompilation of data regarding the seroprevalence of leptospirosis, leishmaniosis and ehrlichiosis in dogs in rural and urban zones of the Comunidad Valenciana (Spain), valuing also,

the existing relation between these diseases in each case. In all cases the clinical-health state of each one of the populations according the origin, manipulation and sanitary controls used was valued.

II - MATERIALS AND METHODS

A total of 864 dogs were studied, 450 males (52,08%) and 414 females (47,92%) all of different races and ages, taken at random and proceeding from different clinics, animal refuges and hunting kennels in the Comunidad Valenciana (Spain). From each animal, following a careful physical exploration, blood samples were taken in order to carry out the plasmatic haematology and biochemistry (total plasmatic proteins, urea, creatinine, alanina-aminotransferasa, total bilirubin, cholesterol and tryglycerides).

For the detection of antibodies against *Leishmania infantum* and *Ehrlichia canis*,

techniques of the enzyme-immunoanalysis (ELISA) and of the indirect immunofluorescence (IFI) were used. The serological analysis of *Leptospira* spp was carried out using a technique of microscopic aglutination (MAT), according to the recommendations of the *National Leptospirosis Reference Center*, testing 12 different serovars. Following, a statistical study was carried out (SPSS 11.5) in order to determine the relation that exists in the infection between *Leptospira* spp, *Leishmania infantum* and *Ehrlichia canis*.

Tableau I

Distribution of males and females in the studied dogs

Origin	Males	Females	Total
Veterinary Clinic	113 (25.11%)	118 (28.50%)	231 (26.74%)
Hunting Kennels	217 (48.22%)	156 (37.68%)	373 (43.17%)
Animal Refuges	120 (26.67%)	140 (33.82%)	260 (30.09%)
Total	450 (52.08%)	414 (47.92%)	864 (100%)

III - RESULTS AND DISCUSSION

Of the 864 dogs of the study, 167 of these (19.8%*) had antibodies against different serovars of the *Leptospira* spp, while 75 dogs (9.0%*) had antibodies against *Leishmania infantum*. 202 dogs (23.5%*) were positive to *Ehrlichia canis*. With respect to the distribution of the diseases and the relation with age and sex, significant differences were not found.

With respect to the three diseases, we found that in their distribution, a clear relation existed between the existence of leptospirosis with

ehrlichiosis, and also between ehrlichiosis and leishmaniosis, this distribution being highly significant in each comparison and different to the results thought to be obtained in the event when these were distributed at random. For the relation between the infection by *Leptospira* spp and *E. canis*, $\chi^2 = 6.46$ ($p < 0.05$) and, for the relation between the infection by *Leishmania* spp and *E. canis*, $\chi^2 = 8.03$ ($p < 0.01$).

* True percentage, obtained when annulling lost values.

IV - CONCLUSION

We may conclude that in those cases where an infection by *Leishmania infantum* or by any serovariety of *Leptospira* spp exists, an analysis should be carried out in order to

detect a possible infection by *Ehrlichia canis* given the high probability of the co-related existence between these diseases.

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