

Campylobacter intestinal carriage among stray and pet dogs*

Disseminação de *Campylobacter* entre cães vadios e de estimação

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FERNÁNDEZ, H. & MARTIN, R. *Campylobacter* intestinal carriage among stray and pet dogs. *Rev. Saúde públ.*, S. Paulo, 25: 473-5, 1991. The natural distribution of thermotolerant *Campylobacter* sp. in dogs (150 stray animals and 64 pets) was studied. *Campylobacter*s were more frequently isolated ($p < 0.01$) from stray dogs (51.3%) rather than from pet dogs (21.9%). All the biotypes described by Lior for *C. jejuni* and *C. coli* were found among stray animals, whereas only *C. jejuni* biotypes I and II and *C. coli* biotype II were found among pet dogs. The need for more studies related to the role of environmental sanitary conditions in the spreading of *Campylobacter* species is noted.

Keywords: *Campylobacter*, isolation. Disease reservoirs. Feces, microbiology.

Introduction

Campylobacter jejuni and *C. coli* are prevalent agents of gastroenteritis in human beings, especially in developing countries^{2,5}. They have been isolated from water, sewage, food of animal origin and from a great variety of domestic and wild animals and birds^{2,6,15}. These can come into frequent contact with humans, as in the case of pets and animals or birds used as food.

Transmission of *Campylobacter* sp. to human beings involves the consumption of contaminated food or water, the handling of raw chickens and direct contact with infected animals or their feces^{2,15}. Cats and dogs have been described as sources of infection, particularly for children^{1,12,14,16}.

Having in mind that remarkable differences have previously been observed in the intestinal carriage of *Campylobacter* among stray and pet dogs^{3,13}, and the lack of information about this epidemiological aspect in developing countries, the natural distribution of thermotolerant *Campylobacter* sp. in these two types of dogs in southern Chile was studied.

Material and Method

The study was conducted in Valdivia city (140.000 inhabitants, 73°11'W, 39°46'S) during a

6 - month period (April to August, 1990).

Two hundred and fourteen animals were studied: 150 stray dogs and 64 pet dogs. Pet dogs are those animals having known owners and maintained in permanent confinement. Animals without a known owner, or even having one, but presenting wandering habits, were considered as stray dogs.

All the dogs were examined in the University Veterinary Clinic where fecal samples were taken from each animal by means of a rectal swab. None of them presented diarrheal symptomatology.

Each sample was identified with an appropriate code number and within 2 to 3 hours after collection was seeded on modified Skirrow's medium comprising Brucella agar, 5% horse blood, Skirrow's antibiotic supplement (Oxoid) plus 10 µg/ml of cephalotin and 2 µg/ml of amphotericin B and FBP supplement (Oxoid). Inoculated plates were incubated at 43°C for 48 hours under microaerobic conditions utilizing the Anaerocult C system (Merk).

After the incubation period, plates were examined and *Campylobacter* species and biotypes were identified using the criteria proposed by Lior¹⁰.

Results

Campylobacter species were isolated from 91 (42.5%) animals. Seventy seven (51.3%) of these were stray dogs and 14 (21.9%) had known owner (pet dogs).

All the biotypes described by Lior¹⁰ for *C. jejuni* and *C. coli* were found in stray dogs, *C. jejuni* biotypes I and II and *C. coli* biotype I being the most frequent (38.9%, 29.6% and 60.9%, respectively).

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Table. Distribution of *Campylobacter* species and their biotypes among stray and pet dogs.

Biotypes			<i>C. jejuni</i>				<i>C. coli</i>		Total			
	Nº	%	Biotype	Nº	%	Nº	%	Biotype	Nº	%	Nº	%
Stray dogs n = 150	54	36.0	I	21	38.9	23	15.3	I	14	60.9	77	51.3*
			II	16	29.6			II	9	39.1		
			III	11	20.4							
			IV	6	11.1							
Pet dogs n = 64	9	14.1	I	5	55.6	5	7.8	I	0	0.0	14	21.9*
			II	4	44.4			II	5	100.0		
			III	0	0.0							
			IV	0	0.0							
Total	n = 214	63	29.4			28	13.1			91	42.5	

* p<0.01

Among the dogs with known owners the distribution of the biotypes of *C. jejuni* and *C. coli* was more restricted. Only *C. jejuni* biotypes I and II (55.6% and 44.4% respectively) and *C. coli* biotype II (100%) were isolated from these animals.

Table shows the distribution of *Campylobacter* isolates among both groups of dogs.

Discussion

Infected animals may be involved in the spread of *Campylobacter* species to man². Dogs and others companion animals have been shown to be sources of infection^{2,4,12,14,16}.

In the present study, the frequency of stray dogs harboring *Campylobacter* species was of 51.3%. This value is similar to that obtained by Simpson et al¹³, and Bruce and Zochowski³ for the same type of animals. On the other hand, as Simpson et al¹³, have found, this study showed that the number of animals with *Campylobacter* in their feces was significantly greater in stray than in pet dogs. However, a higher number of carriers was found among pets than in the study of Simpson et al¹³.

Fox et al⁹, stated that the isolation rates of *Campylobacter* in certain dog populations may reflect the inadequate environmental sanitation prevailing where the animals are living or maintained. So when sanitation and housing are often less than ideal, the animals have considerable opportunities for cross-contamination.

When Lior's¹⁰ biotyping scheme was applied to *Campylobacter* strains isolated from stray dogs, the 4 biotypes described for *C. jejuni* and the 2 for *C. coli* were found. Among the strains isolated from pet dogs, the biotype distribution for both *Campylobacter* species was more restricted. Only *C. jejuni* biotypes I and II and *C. coli* biotype II were found.

The latter biotypes are the most frequently isolated from cases of human diarrhea in Valdivia

city* and in Santiago city⁸. These findings suggest that pet dogs could be associated, as sources of infection in cases of diarrhea. This fact has already been described in developed countries^{1,12,14,16}. However, in developing countries there are no documented data linking pet dogs with known cases of *Campylobacter* enteritis.

Stray dogs are animals that are not in frequent contact with human beings thus suggesting that their participation as sources of infection is limited and that they have greater importance as spreaders of *Campylobacter spp.* to the environment. At the same time, a contaminated environment could provide many opportunities for the transmission of *Campylobacter spp.* to birds, mammals and humans². In Valdivia, the 4 biotypes of *C. jejuni* and the 2 of *C. coli* were isolated from surface water⁷.

The high prevalence of dogs which are intestinal carriers, together with the wide distribution of *C. jejuni* and *C. coli* biotypes among stray dogs, as well as our findings in surface water⁷ suggest that environmental conditions play an important role in this epidemiological picture. Similar findings have been observed in developing countries among children living in poor, crowded and contaminated urban slums¹¹.

This is probably, an epidemiological aspect that could also be found in relation to other animal populations. Therefore further studies must be undertaken with a view to clarifying the role of environmental sanitary conditions in the spreading of *Campylobacter* species and the detection of all the links involved in their transmission.

FERNÁNDEZ, H. & MARTIN, R. Disseminação de *Campylobacter* entre cães vadios e de estimação. Rev. Saúde públ., S. Paulo, 25: 473-5, 1991. Foi estudada a distribuição natural de espécies termotolerantes de *Campylobacter* em 159 cães vadios e em 64 cães de

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companhia em confinamento permanente. Espécies de *Campylobacter* foram isoladas mais frequentemente ($p < 0,01$) dos cães vadios (51,3%) do que dos cães de companhia (21,9%). Todos os biotipos descritos por Lior para *C. jejuni* e *C. coli* foram encontrados entre as amostras isoladas dos cães vadios. Nas amostras isoladas dos cães mantidos em confinamento permanente somente foram encontrados os biotipos I e II de *C. jejuni* e o biotipo II do *C. coli*. Salienta-se a necessidade de realizar outros estudos para estabelecer a relação entre as condições de saneamento ambiental e a disseminação das espécies termotolerantes de *Campylobacter*.

Descritores: *Campylobacter*, isolamento. Reservatórios de doenças.

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