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The occurrence of *Campylobacter jejuni* in dog faeces from a public park

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SUMMARY

Dog faeces collected from a public park were cultured on selective media for *Campylobacter* spp. *Campylobacter jejuni* was isolated from 12 (4·6 %) of 260 specimens. In contrast *Salmonella* spp. were found in only three (1·2 %). Six of the 12 isolates were nalidixic acid-resistant thermophilic campylobacters (NARTC), whereas during the same period of study none were found among human isolates. Most of the campylobacter positive faeces were found during June and July. Dog faeces deposited in public places constitute only a small potential source of infection by this organism.

INTRODUCTION

Campylobacter jejuni is now well recognized as a world-wide cause of bacterial diarrhoea (Blaser & Reller, 1981). However, the epidemiology of campylobacter enteritis is still not fully defined. Epidemics from milk and water have been described (Robinson & Jones, 1981; Mentzing, 1981), and campylobacters found naturally in domestic animals and pets are also a probable cause of human infections (Svedhem & Kaijser, 1981). In particular, dogs and especially puppies may be responsible for the transfer of these organisms to human contacts (Blaser *et al.* 1978; Skirrow, 1977). Campylobacter isolation rates in this country of 7–49 % for dogs (Bruce, Zochowski & Fleming, 1980; Holt, 1980) and similar observations from other countries have been reported (Blaser *et al.* 1980*b*; Ferreira, Ribeiro & Ricciardi, 1979; Jorgensen, 1981). Richardson & Koornhof (1979) reported that 36 % of freshly voided dog faeces collected from pavements yielded campylobacters. The aim of the present investigation was to determine the incidence of *C. jejuni* in dog faeces collected from a public park in order to estimate its significance as a possible source of human infection. For simplicity I use the term *C. jejuni* to include organisms conforming to *C. jejuni*, *C. coli* and NARTC groups (Skirrow & Benjamin, 1980*a*) but where a distinction between the three has been made this is indicated in the text.

MATERIALS AND METHODS

During a twelve month period – January to December 1981 – 260 dog faeces were collected from a public park. The park was visited weekly; only fresh-looking samples were taken.

Each specimen was inoculated directly onto a campylobacter selective medium

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(Skirrow, 1977) and into enrichment broth consisting of nutrient broth 375 ml, horse blood 25 ml, vancomycin 10 mg/l, polymyxin B sulphate 2500 i.u/l and trimethoprim lactate 5 mg/l. After overnight incubation the enrichment broth was subcultured onto campylobacter selective medium. All cultures were incubated at 43 °C in an atmosphere of 5% oxygen plus 7% CO_2; plates were examined after 2 days. Smears from suspect colonies checked for positive oxidase and catalase reactions, were identified as *C. jejuni* by their characteristic morphology on Gram staining. All campylobacter isolates were biotyped (Skirrow & Benjamin, 1980*b*). Examination for salmonellae was carried out using standard direct plating and enrichment methods.

During the period of the study details were collected of all isolates from human cases of campylobacter enteritis whose home was within two miles of the park.

RESULTS

Of 260 dog faeces examined, 12 (4·6%) yielded *C. jejuni*, compared with the isolation of salmonellae from three (1·2%). On no occasion were the two organisms found in the same specimen. There were 52 isolates of *C. jejuni* from human infections over the same period. The month-by-month isolation of both dog and human campylobacter strains is shown in Table 1.

The *Salmonella* spp. were isolated in January (*S. panama*), June (*S. vejle*) and July (*S. typhimurium*).

The enrichment procedure enhanced the isolation rate of campylobacters: 4 (33%) of the 12 isolates would not have been detected without enrichment. Four samples were direct plate positive/enrichment positive, and four were positive by direct plating only.

The distribution of the biotypes of both dog and human isolates is shown in Table 2.

Table 1. Campylobacter jejuni *isolated from dogs and humans by month*

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Dogs	0	0	0	0	0	7	2	0	1	1	1	0	12
Humans	1	0	6	4	4	6	7	5	4	10	4	1	52

Table 2. *Results of biotyping dog and human campylobacter isolates*

	Number of strains isolated (%)	
	Dog	Human
NARTC*	6 (50)	0 (0)
C. jejuni 1	3 (25)	38 (74)
C. jejuni 2	0 (0)	7 (14)
C. coli	3 (25)	6 (12)
Total	12 (100)	51† (100)

* Nalidixic acid-resistant thermophilic campylobacters.
† One isolate lost before biotyping.

DISCUSSION

The results show that *C. jejuni* is present in dog faeces collected from public parks, although in this study the incidence was below that generally reported when dogs are directly sampled. Most of the dogs seen in the park were present with their owners, which may indicate a good standard of care; few stray dogs were noted in the park during the period of study.

Human isolates in Britain are reported to reach a peak during the third quarter of the year (Epidemiology, 1981). The seasonal variation of *C. jejuni* isolates from dogs in this study is difficult to evaluate due to the small numbers, although 75% of the isolates were made during the summer months of June and July. This may represent a more pronounced trend in dogs than humans since campylobacter survival would be expected to be at its shortest in higher ambient temperatures and increased sunlight of summer. Blaser *et al.* (1980*a*) report that *C. jejuni* in naturally infected human faeces held at 25 °C in air did not survive longer than 7 days, but were recoverable for up to 3 weeks from samples held at 4 °C. The survival of *C. jejuni* in faeces exposed to the variations of daily ambient temperatures, sunshine and rainfall needs further clarification.

The dog faeces show a high incidence of NARTC biotypes whereas there was a complete absence of this biotype from human samples. There are several possible explanations for this finding; NARTC strains may survive in voided faeces better than *C. jejuni* or *C. coli* or before collection some dog faeces may have been contaminated with wild bird droppings – a common source of NARTC strains. Skirrow & Benjamin (1980*a*) report that NARTC strains account for less than 1% of human infection but that about 8% of dog strains belong to this bio-type. However this figure for dog strains may be unrepresentative because about a third of the strains were obtained through follow-up of human patients. My finding of 50% NARTC strains in dogs may be a chance finding among only a few isolates.

Although the use of an enrichment technique increased the isolation rate, the fact that four samples were positive on direct plates only suggests that this enrichment method was not fully reliable. Bolton & Robertson (1982) have proposed an improved enrichment broth.

Faeces deposited in parks and other places frequented by dogs constitute therefore only a small potential source of infection, with campylobacters as well as with other agents, although their presence is aesthetically undesirable.

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