

PAHO Research Grants Program
Graduate Thesis Grants in Public Health
Final Report

Epidemiology of human *Campylobacter*-associated
gastroenteritis in Barbados: identification of likely sources of
infection

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Abstract

A survey of *Campylobacter* enteritis in Barbados was conducted for the period January 2000 to August 2003. The number of cases reported at the Winston Scott Polyclinic increased over this period, the majority occurring in children aged 1-4 years. Small increases in incidence during the months of March, June to August and November to December may be due to increased consumption of foods sold from small stalls at social events. Clinical isolates were predominantly *C. jejuni* (63.6%); 31.8% were *C. coli* and 4.6% could not be identified.

An investigation of *Campylobacter* carriage in animals and contamination of animal food products was conducted in order to identify likely sources of human infection. *Campylobacter* was isolated from chickens (94.2%), pigs (90.5%), dogs (46.9%), cats (37.3%), wild birds (39.3%), monkeys (17.1%) and sheep (4.2%), but not from cows. Chicken meat was contaminated more frequently (58%) than turkey meat (5%), pork (3.9%) and beef (1.8%). *C. jejuni* was the most common species recovered from chickens (86.6%), dogs (51.5%) and chicken meat (79.8%); whereas *C. coli* was the predominant species carried by pigs (98.4%). RAPD genotyping of isolates using primers

OPA 11 and HLWL 85 showed that isolates from chicken meat were similar to human isolates and could not distinguish between four canine isolates and two clinical isolates. Thus, dogs and chicken meat were the most likely sources of human infection.

Transmission of *Campylobacter* in a local poultry production system was examined by testing at the hatchery, on the broiler farm and at the processing plant during two production cycles. Samples from the hatchery and faeces from week-old chicks were negative for *Campylobacter*. Broiler chicks were colonized as early as three weeks after placement and appeared to acquire the infection from more than one source on the farm. RAPD typing of isolates from litter beetles and broiler faeces from the two cycles showed that beetles may have been involved in carryover of infection to the second flock.

The antimicrobial susceptibility of *Campylobacter* isolates from different sources was determined using the disc-diffusion assay. A high level of resistance to fluoroquinolones was found in isolates from humans (38.8%), chicken (30.4%) and dogs (46.2%). Tetracycline resistance was common in *C. coli* strains from pigs (68.2%) and resistance to erythromycin was rare (5.7%). All isolates were susceptible to meropenem and chloramphenicol, and only 1.9% were resistant to

gentamicin. A high frequency of multi-resistant campylobacters (18%) may have implications for treatment of clinical infection. Based on their resistotypes, dogs and chickens are likely sources of human infection. Our findings suggest that erythromycin would be more effective than the fluoroquinolones for treatment of human *Campylobacter* infection in our population.

There is a need for further investigation of likely sources of human infection focussing on dogs and chicken meat and a more extensive study of *Campylobacter* in the poultry industry. The occurrence of fluoroquinolone-resistant and multi-resistant isolates is of concern and should be monitored closely.

Keywords: *Campylobacter*, enteritis, diarrhoea, Barbados, Caribbean, antibiotic resistance

In accordance with the recommendation of the PAHO Internal Advisory Committee on Research (Ref: IKM/RC/RG-T/BAR-3189), this final report comprises four scientific articles which will be submitted to international peer-reviewed scientific journals for publication. Therefore their publication or circulation is not authorized. Should they be accepted for publication, copies of the published articles will be provided.

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