Campylobacter outbreak due to chicken consumption at an Australian Capital Territory restaurant

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Abstract

***Campylobacter* is the most common cause of bacterial gastroenteritis in Australia, with 15,008 notifications in 2004. This represents only a small fraction of the total cases of *Campylobacter*. Despite this, outbreaks are rarely reported. This report describes the investigation of an outbreak of campylobacteriosis following a restaurant meal in the Australian Capital Territory. The outbreak was identified by a general practitioner who notified the Health Protection Service, ACT Health. A retrospective cohort investigation of the 27 work colleagues who attended lunch at the restaurant was conducted. Eleven cases were identified with two culture positive for *Campylobacter*. An association between eating several dishes containing chicken was identified. This outbreak highlights the important identified risk for *Campylobacter* infection from commercially prepared chicken. It also demonstrates the important role of clinicians in notifying disease outbreaks. *Commun Dis Intell* 2006;30:373–377.**

Keywords: Campylobacter*, outbreak, gastroenteritis, foodborne disease*

Introduction

Campylobacter is the most common bacterial cause of gastrointestinal infection in Australia, with 15,008 notifications to health authorities in Australia in 2004.[1] However, the number of notified cases represents only a small percentage of the total cases of C*ampylobacter* and it has been estimated that the true burden is approximately 277,000 cases annually.[2] Outbreaks of campylobacteriosis are infrequent and the majority of infections appear to be sporadic. The reasons for this include the microbiological characteristics of the organism, the lack of public health follow-up of cases and the incomplete strain characterisation in microbiology laboratories.[3] Evidence from the *Campylobacter* Sentinel Surveillance scheme in the United Kingdom[4] suggests that *Campylobacter* outbreaks may be more common than previously suspected. Recent outbreaks have resulted from contamination of drinking water, raw milk, and cross contamination from high risk foods including chicken, salad and dairy products.[5–12]

A recent case-control study of *Campylobacter* infections in Australia identified that eating and preparing chicken was responsible for approximately 30 per cent of *Campylobacter* cases.[13] Raw chicken is commonly contaminated with *Campylobacter*. A retail survey in the Australian Capital Territory in 2000 found 20.6 per cent of raw chicken samples were positive for *Campylobacter*.[14] However, retail chicken surveys in other countries have identified much higher levels of *Campylobacter* ranging from 32 per cent to 83 per cent of samples.[15–18] Despite such high levels of contamination with *Campylobacter*, chicken has not been identified as a major cause of the infrequent *Campylobacter* outbreaks.

This report describes the epidemiological, microbiological and environmental investigation of a *Campylobacter* outbreak following a meal at a restaurant in the Australian Capital Territory in 2005.

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Methods

In April 2005 the Health Protection Service of ACT Health was notified of a number of cases of gastrointestinal illness by a general practitioner whose patient had tested positive for *Campylobacter*. Investigations revealed that the patient's illness followed a lunch with work colleagues at a local restaurant approximately three days earlier.

Hypothesis generating interviews were conducted with two cases: the index case, and another work colleague who was hospitalised with *Campylobacter enteritis*. A retrospective cohort study was undertaken with interviews conducted by telephone. The cohort was defined as the people who attended the workplace lunch at the restaurant. A questionnaire was used to obtain information about the onset and nature of any gastroenteritis illness, exposure to foods at the lunch banquet and contact with other people ill with gastroenteritis either prior to, or after the individual's illness. A case was defined as a person who attended the restaurant lunch on 8 April who had diarrhoea between 9 April and 18 April. Questionnaires were completed with each person who attended the lunch. Data were entered and analysed with SPSS Version 11.

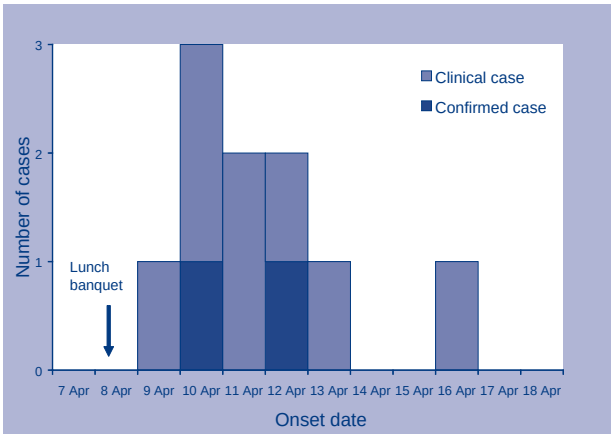
To investigate the environmental cause of the outbreak, ACT Health Protection Service staff visited the restaurant to audit food safety and collect samples for analysis.

Results

Cohort study

Using the questionnaire, public health officers interviewed all 27 people identified in the cohort. The median age of respondents was 33.5 years (range 19–45 years) and 20 (74%) were female (Figure).

Figure. Cases of gastroenteritis among group attending restaurant lunch on 8 April, by date of onset



There were 11 cases identified with a median age of 35 years (range 21–45 years) and six (55%) were female. Other symptoms apart from diarrhoea were nausea in 10 cases (91%), abdominal pain in eight cases (72%), vomiting in six cases (54%), and fever in six cases (54%). Duration of illness was between three and seven days for nine of the cases. One case was hospitalised.

Twenty of the cohort had eaten a banquet and the other seven people had ordered separate dishes from the á la carte menu. Ten of the cases (91%) had eaten the banquet compared to 62 per cent of people who were not ill. The risk ratio for eating the banquet was 3.5 (95% confidence interval (CI) 0.5–22.6). The attack rate for those who ate the banquet was 50 per cent (Table). The banquet included a selection of pizza and pasta dishes and warm chicken salad. The one case that ordered from the menu had a mega meat pizza.

Foods from the banquet with the highest risk ratios (RR) were: warm chicken salad RR 3.5 (95% CI 0.5–22.6) with an attack rate of 50 per cent and chicken mushroom (pollo funghi) pasta, RR 3.4 (95% CI 1.5–7.8) with an attack rate of 86 per cent. People eating chicken in any dish had a Relative Risk of 3.5 (95% CI 0.5–22.6) for developing gastroenteritis. It was not possible to perform stratified analysis of these chicken dishes as all cases that ate chicken mushroom pasta also consumed the warm chicken salad. None of the respondents mentioned that the chicken or other meat dishes were under-cooked.

There were no additional *Campylobacter* cases linked to the same restaurant through a search of the ACT Notifiable Disease database or routine investigation of *Campylobacter* questionnaires sent to all cases in the Australian Capital Territory between March–May 2005.

Microbiological investigation

Three faecal specimens were obtained, two were positive for *Campylobacter*. No speciation was performed by either of the two pathology laboratories receiving these samples. All three samples were negative for other pathogens including norovirus and rotavirus.

Environmental investigation

An environmental audit of the restaurant revealed no major deficiencies in food safety although the pizza bar ingredients were being stored at 6–8°C, and there was no soap in the kitchen hand basin.

Fresh samples of the warm chicken salad, chicken mushroom pasta, tandoori chicken pizza, original pizza and four toppings pizza were obtained from

Table. Attack rates and relative risk for foods eaten at the restaurant lunch on Australian Capital Territory, 8 April 2005

Food	Ate			Did not eat			
	Ill	Total	Attack rate (%)	Ill	Total	Attack rate (%)	RR (95% CI)
Pizza	9	19	47	2	8	25	1.9 (0.5–6.9)
Original	5	7	71	6	20	30	2.4 (1.1–5.4)
Super special	3	8	38	8	19	42	0.9 (0.3–2.5)
Marinara	3	5	60	8	22	36	1.7 (0.7–4.1)
Quattro gusti	5	7	71	6	20	30	2.4 (1.05–5.4)
Vegetarian	3	6	50	8	21	38	1.3 (0.5–3.5)
American	4	6	67	7	21	33	2.0 (0.9– 4.6)
Mushroom	5	7	71	6	20	30	2.4 (1.1–5.4)
Cappriciosa	2	3	67	9	24	38	1.8 (0.7–4.6)
Napoletana	2	3	67	9	24	38	1.8 (0.7–4.6)
Aussie	2	3	67	9	24	38	1.8 (0.7–4.6)
Tropical	2	3	67	9	24	38	1.8 (0.7–4.6)
Margherita	2	3	67	9	24	38	1.8 (0.7–4.6)
Mexicana	4	5	80	7	22	32	2.5 (1.2–5.3)
Calabrese	3	3	100	8	24	33	3.0 (1.7–5.3)
Pasta	9	19	47	2	8	25	1.9 (0.5–6.9)
Napoletana	5	8	63	6	19	32	2.0 (0.8–4.6)
Arrabiata	3	4	75	8	23	35	2.2 (1.0–4.8)
Bolognese	3	5	60	8	22	36	1.7 (0.7–4.1)
Carbonara	5	9	56	6	18	33	1.7 (0.7–4.0)
Primavera	1	3	33	10	24	42	0.8 (0.2–4.2)
Alla matriciana	3	3	100	8	24	33	3.0 (1.7–5.3)
Calabrese	1	2	50	10	25	40	1.3 (0.3–5.4)
Ortolana	1	1	100	10	26	38	2.6 (1.6–4.2)
*Pollo funghi	6	7	86	5	20	25	3.4 (1.5–7.8)
Pesto	3	8	38	8	19	42	0.9 (0.3–2.5)
Marinara	4	7	57	7	20	35	1.6 (0.7–3.9)
*Zefferelli	3	5	60	8	22	36	1.7 (0.7–4.1)
Salmon	1	1	100	10	26	38	2.6 (1.6–4.2)
*Warm chicken salad	10	20	50	1	7	14	3.5 (0.5–22.6)
Drinks							
Water	10	22	45	1	5	20	2.3 (0.4–13.9)
Wine	7	13	54	4	14	29	1.9 (0.7–5.0)
Leftover food taken home	2	4	50	9	23	39	1.2 (0.4–3.4)
Ate chicken in any dish	10	20	50	1	7	14	3.5 (0.5–22.6)

* Indicates contains chicken.

the restaurant during inspection. These samples were negative for pathogens. However, the samples were not tested for *Campylobacter* due to lack of accreditation in the ACT Government Analytical Laboratory at that time.

Discussion

Campylobacteriosis has been the most common notifiable infectious enteric disease in the Australian Capital Territory since 1991, with 383 notifications in 2004. These cases appear to be sporadic. This is the first *Campylobacter* outbreak detected in the Australian Capital Territory. This outbreak highlights important identified risks for *Campylobacter* infection, particularly chicken prepared in a commercial catering setting.[3] The vehicle for this outbreak was likely to have been either the warm chicken salad or the chicken mushroom pasta. Risks associated with undercooked chicken have been highlighted in other studies.[9,13] This outbreak highlights the importance of ensuring that chicken is thoroughly cooked and taking measures to prevent cross-contamination of ready to eat foods with raw chicken.

Recent work in the United Kingdom has highlighted the importance of strain characterisation to improve identification of *Campylobacter* outbreaks and understanding the different epidemiology of different species.[3,19] This outbreak highlights the lack of microbiological investigation as routine laboratory practice in the Australian Capital Territory and New South Wales is limited to isolating *Campylobacter* spp. and no further typing is performed. The ACT Government Analytical Laboratory has since undergone NATA accreditation of its methods for detecting *Campylobacter* in food and this should enable more complete microbiological investigation in future outbreaks.

This outbreak was notified by a doctor and may otherwise have been missed as there were only two cases notified to Communicable Disease Control, ACT Health. The Australian Capital Territory has recently updated the Notifiable Disease Code of Practice and now requires dual notification by doctors and hospitals as well as laboratories. This report highlights the additional important role of clinicians in notifying disease outbreaks.[20]

Acknowledgements

We would like to acknowledge the Health Protection Service staff who were involved in this outbreak investigation, particularly Dr Geetha Isaac-Toua, Geraldine Wan, Ralph Anthony and Peter Kong. We are also grateful to Dr Charles Guest, Australian Capital Territory Deputy Chief Health Officer, for his comments on the manuscript.

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