

A milk-borne outbreak of *Campylobacter* infection

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SUMMARY

Campylobacter jejuni was isolated from the stools of 148 patients with symptoms and 57 symptomless subjects, and from a milk sock filter, following an outbreak of enteritis associated with consumption of unpasteurized milk. The incubation period ranged from 2–11 days with a peak at 5 days. There were no secondary cases. The attack rate was around 50%. Cases occurred in all age groups but were maximal in the 1–10 age group. Recovery from symptoms was complete in the majority in less than 1 week. No long term excretors were identified. There were no differences between culture positive individuals, with or without symptoms, in age or sex distribution or duration of excretion.

INTRODUCTION

Unpasteurized milk has long been suspected as a possible vehicle for transmission of *Campylobacter* species from animals to man (Levy, 1946; Cook & McKay, 1977) but only recently has supportive evidence been forthcoming from small outbreaks in England (Pether, 1978; Robinson *et al.* 1979) and U.S.A. (Blaser *et al.* 1978) We report a major outbreak of campylobacter enteritis in Scotland associated with consumption of unpasteurized milk.

THE OUTBREAK

On the night of 13–14 January 1979 during extreme weather conditions there was a failure in the public electricity supply in South Kincardineshire and North Angus lasting some 3½ hours. As a direct consequence the pasteurization plant at a large dairy was out of action and the milk distributed on the morning of 15 January was unpasteurized. The area covers approximately 60 square miles and includes 8 villages, 2 hospitals and a military base (approx. population 7000). The dairy supplied 400 gallons of milk daily to about half the households in the area, both hospitals and part of the base. The first patients presented with symptoms of abdominal pain and diarrhoea on the evening of 17 January and the peak incidence occurred on 20 January (Fig. 1). There were no secondary cases. The pasteurizing plant again broke down on 22 January but no fresh cases were identified following the distribution of this unpasteurized milk.

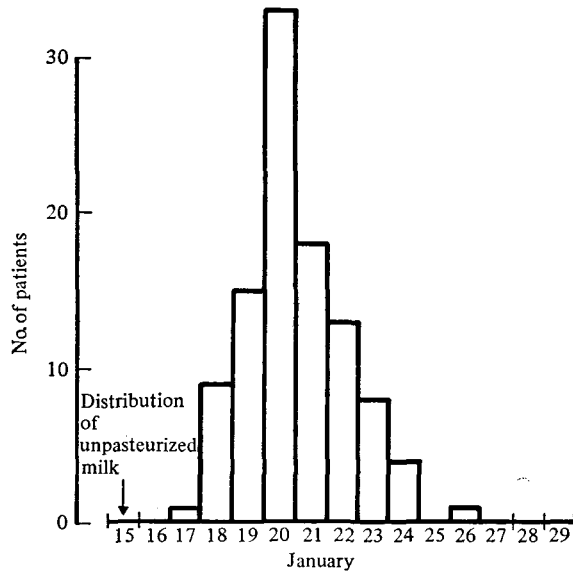


Fig. 1 Date of onset of symptoms in culture-positive patients.

Table 1. Analysis of patients receiving unpasteurized milk

	No. of patients receiving unpasteurized milk	With symptoms: Culture		Without symptoms: Culture		Attack rate (%)
		+	-	+	-	
Practice A	220	45	55	30	90	45
Practice B	127	43	24	12	48	53

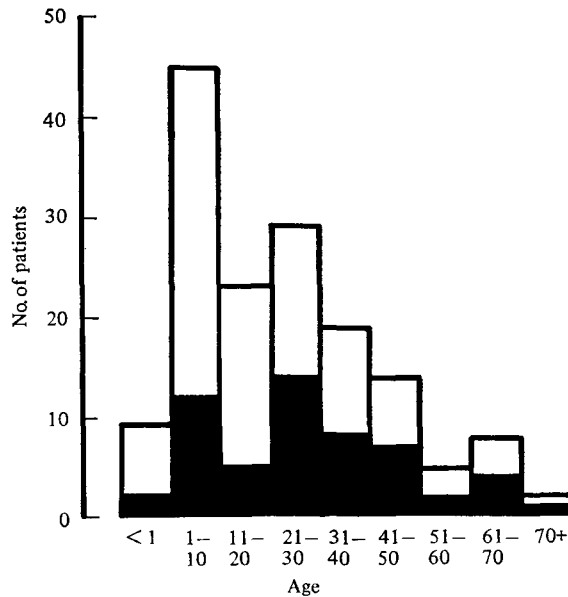


Fig. 2 Age distribution of culture positive patients. ■, Without symptoms; □, with symptoms.

METHODS

Campylobacter jejuni was isolated from faecal specimens using selective media (Skirrow, 1977). Plates were also inoculated with swabs from the surface of the milk sock filters. These milk socks were then placed in containers, immersed in liquid selective medium and subcultured daily for 4 days. All were incubated at 43 °C in an atmosphere of 90 % nitrogen and 10 % CO₂.

INVESTIGATION

Campylobacter jejuni was isolated from the stools of 148 contacts with symptoms and 57 without, all of whom had consumed the unpasteurized milk. No other enteric pathogens were found. Analysis of the data from 2 general practices revealed an attack rate of around 50 % (Table 1). The peak incidence occurred in the 1–10 age group with a marked reduction in cases over 50 (Fig. 2).

A survey of the symptoms and signs and their incidence showed the following distribution.

	% patients affected
Diarrhoea	82
Abdominal pain	75
Fever	52
Headache	50
Nausea	30
Myalgia	31
Vomiting	20
Blood/mucus in stool	25
Backache	20
Rash	3

Recovery from symptoms was complete in the majority of patients in less than a week. Six patients required hospital admission but there were no deaths directly attributable to *Campylobacter* infection. The duration of excretion was less than 2 weeks in 50 % of culture positive individuals and all were clear by 2 months (Fig. 3). There were no differences between the asymptomatic and symptomatic culture positive individuals, with or without symptoms, in age or sex distribution, incubation period or duration of carriage.

Examination of rectal swabs from the dairy herd (160 cows) by Veterinary Officers did not reveal any growth of *Campylobacter jejuni*. The organism was however recovered from 1 of 16 milk sock filters examined but not from any of the bulk milk samples taken daily for 7 days from 20 January. The positive culture was obtained from a milk sock taken on 24 January. In view of the history of burst pipes in the dairy during the severe weather, water samples were examined but no campylobacters were isolated.

DISCUSSION

The introduction of selective stool culture techniques for *Campylobacter jejuni* has enabled bacteriologists to define the causative organism and trace the source

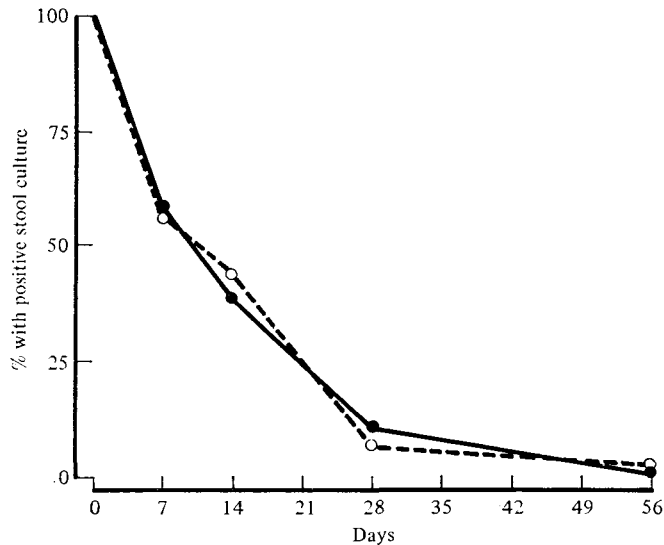


Fig. 3. Duration of excretion. —●—, Without symptoms; --○--, with symptoms.

of some outbreaks of gastroenteritis which hitherto would have been branded as 'cause unknown, presumed viral'.

The evidence from this outbreak implicates *Campylobacter jejuni* as the cause of enteritis following contamination of milk from animal sources. This underlines the potential danger inherent in consumption of unpasteurized milk. The possibility of such outbreaks occurring will remain until all milk is heat treated.

Although the organism was not isolated from the herd in this case, the evidence from other outbreaks and the finding of *Campylobacter jejuni* in the milk sock suggest faecal contamination of the milk. *Campylobacter jejuni* has been isolated from the faeces of cattle (Smibert, 1978) but the carriage rate in dairy herds is not known. The likelihood of such contamination occurring is clearly greater where there has been an outbreak of scouring in the herd associated with a breakdown in dairy hygiene. The difficulty in obtaining a positive milk sock culture suggests intermittent contamination of the milk similar to that encountered in the Bradford outbreak (Robinson *et al.* 1979).

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