

CAMPYLOBACTER ENTERITIS IN SINGAPORE

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SYNOPSIS

The first case of campylobacter enteritis was reported on the 8th October, 1980. Two subsequent cases were detected in the following month. The first patient was an adult who experienced typical clinical symptoms as described in earlier reports. Our three strains conformed to reactions, both culturally and biochemically, for *Campylobacter jejuni/coli* and were generally susceptible to most antibiotics except trimethoprim-sulphamethoxazole.

INTRODUCTION

McFaydean et al. (1) first reported vibriosis in cattle. Later in 1918, Smith (2) examined the causative organism and named it *Vibrio fetus*. The first isolation of the vibrio from a human source was made by Levy (3) in 1946 during an outbreak of gastroenteritis. Since then, several isolations from human as well as animals had been reported in many parts of the world. King (4) in 1957 studied the *V. fetus* and a closely "related vibrio" and established that the growth of the "related vibrio" was improved by reduced oxygen tension, longer period and higher temperature for incubation and the organism possessed certain biochemical characters different from the true vibrios. In view of these distinctive properties, Sebald and Veron (5) proposed that these "related vibrios" be placed in a separate genus *Campylobacter* in the family *Spirillaceae*. Three species are now recognized: *Campylobacter fetus*, *Campylobacter sputorum* and *Campylobacter faecalis*. *C. fetus* is divided into three subspecies, *fetus*, *intestinalis* and *jejuni*, the last two of which are known human pathogens (6). The terminology *C. jejuni/coli* (7) corresponds to the *C. jejuni-C. coli* group of Veron and Chatelain (8) and to *C. fetus* subsp. *jejuni* of Smibert (9). These names are used synonymously for strains associated with enteritis.

This report describes the laboratory study of the first strain of *C. jejuni-coli* isolated in Singapore.

CASE REPORT

The patient of the first case of campylobacter enteritis was a 22 year-old male tourist who arrived on the 4th October, 1980. Two days later, he developed acute diarrhoea with severe lower abdominal colic, accompanied by high fever, chills and rigor. Diarrhoea

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occurred three-hourly, stools were watery and greenish, but there was no blood or mucus. On the 7th October, the patient was admitted to Middleton Hospital. One of his stool specimens grew *C. jejuni-coli*. He became afebrile on the evening of the 8th October and the next day, his diarrhoea was settling. Treatment was symptomatic. He was discharged on the 10th October.

MATERIALS AND METHODS

Cultural: The stool specimens received at the Enteric Bacteriology Laboratory were submitted to routine investigations for the presence of enteric bacterial pathogens. In view of the watery nature, the stools were also screened for the vibrio and campylobacter groups. The cultivation of the campylobacters required special techniques which were performed as follows: A small inoculum of stool was plated on Thayer-Martin medium (10) and incubated at 42°C for 48 hours under microaerophilic condition. This atmospheric condition was achieved by employing a GasPak (BBL) in an anaerobic jar (without the catalyst) as suggested by Brachman and Robinson (11).

Biochemical: Identification of the campylobacter was based on confirmatory tests recommended by Brachman and Robinson (11). All tests were incubated at 42°C for 48 hours under microaerophilic condition.

Antibiotic susceptibility testing: The Bauer et al. method was used, (12) with the exception that incubation was performed at 42°C for 48 hours under microaerophilic condition to produce a good growth of the campylobacter.

RESULTS

The campylobacter appeared as diffused, pink colonies on the Thayer-Martin medium. The growth was mucoid and adhered to the agar surface. Test results confirming the identification of the *C. jejuni-coli* are shown in Tables 1 and 2, and antibiotic susceptibility in Table 3.

DISCUSSION

For many years, *C. fetus* subsp. *fetus* had been known among veterinarians as a causative agent of infectious abortion in cattle and ewes. This organism had also

TABLE 1 BIOCHEMICAL REACTIONS OF 1ST CAMPYLOBACTER STRAIN ISOLATED IN SINGAPORE.

Cytochrome oxidase	+
Glucose fermentation (O-F medium)	-
1% glycine in Brucella broth	+
3.5% NaCl	-
Hydrogen sulphide - Kligler's iron agar	-
cystine medium with lead acetate paper	+
Nalidixic acid	Sensitive

TABLE 2 CONDITIONS FOR OPTIMAL GROWTH OF THE CAMPYLOBACTER STRAIN

	Air	CO ₂	* <i>Escherichia coli</i>
Room temperature at 25°C	-	-	-
37°C	-	±	-
42°C	-	+	+

* GasPak was substituted by a culture of *E. coli* in the wax-sealed Thayer-Martin plate to reduce oxygen content for good growth of the campylobacter.

TABLE 3 ANTIBIOTIC SUSCEPTIBILITY TESTING WITH SENSI-DISCS (BBL)

	Disc potency	Susceptibility
Chloramphenicol	30 mcg	S
Ampicillin	10 "	S
* Trimethoprim-sulphamethoxazole	25 "	R
Tetracycline	30 "	S
Neomycin	30 "	S
Triple-sulfa	250 "	S
Gentamicin	10 "	S
Kanamycin	30 "	S
Streptomycin	10 "	S

* Trimethoprim = 1.25 mcg.;
sulphamethoxazole = 23.5 mcg.
BBL = Baltimore Biological Laboratory
S = Sensitive; R = Resistant.

been isolated from many domestic animals, poultry and avian species. *C. jejuni-coli* is recognized as a common cause of human diarrhoea. However, unless specific cultural conditions are employed, the organism can be easily missed out in the course of bacteriological investigations of diarrhoeal stools. Recent reports had indicated that most patients were infected through contact with animals or consumption of contaminated foods or water, and all had a characteristic clinical illness with severe abdominal pain. Our first *C. jejuni-coli* strain was isolated from a typical case of campylobacter enteritis with clinical symptoms similar to those described by Skirrow (13). It is interesting to note that our campylobacter strain could be successfully cultured by applying the Fortner Principle (14) i.e. the reduction of oxygen content in the presence of a rapidly-growing facultative anaerobe in a closed system. This was demonstrated by growing *Escherichia coli* in the culture medium as a substitute for the GasPak. Results are shown in Table 2. Although the methods employed in the Enteric Bacteriology Laboratory are not optimal, we have found them satisfactory and the materials are easily available. To date, three cases of campylobacter enteritis have been detected: 1 adult and 2 children. The campylobacter isolates

were susceptible to most of the antibiotics except trimethoprim-sulphamethoxazole.

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