BACTERAEMIC ENTERITIS DUE TO *CAMPYLOBACTER JEJUNI*

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SUMMARY

Campylobacter jejuni *is being increasingly recognised as a cause of bacteraemic enteritis and two infants with this condition are described. Awareness of the organism as a possible cause of septicaemia is important because it has special growth requirements and delay in the diagnosis can be detrimental in a disease which usually only responds to erythromycin, gentamicin and chloramphenicol.*

INTRODUCTION

Campylobacteriosis in an infectious disease of animals that is transmissable to man. The aetiological agents are members of the genus *Campylobacter,* a name compounded from the Greek *campylo* ('curved') and *bacter ('rod').* [1] Members of this genus are small gram-negative, microaerophilic, curved-to-spiral rods that have a single polar flagellum. Representatives include pathogens for animals and man, as well as saprophytes and can be found in the intestinal tract and oral cavity. [2]

Infections in man have been recognized only since 1947 and are associated with the *Campylobacter fetus* subspecies *intestinalis* and *jejuni. Campylobacter* infection in man in associated with a variety of symptoms, the most common being fever. The organism is also involved in many conditions such as bacteraemia, septic arthritis, abortion, endocarditis, meningitis, thrombophlebitis and acute enteritis. [3]

Predisposing factors seem to play a role in these infections. The very young and old, as well as individuals with chronic debilitating diseases or immunosuppression are particularly susceptible to infection with *C. fetus.* [4] Most isolations in clinical laboratories have been from blood cultures. They have also been isolated from faeces of patients, especially children with enteritis. [2] Enteritis in children along with fever and other symptoms is probably more numerous and more important than is now believed. But like infections with other intestinal pathogens, infections with campylobacters do not always produce symptoms, asymptomatic excretors and mild cases can commonly be found among the close contacts of cases. [1]

The frequency and importance of *Campylobacter* infections in Malaysia have not been documented. This paper describes two cases of bacteraemic enteritis due to *Campylobacter* seen at the University Hospital, Kuala Lumpur over a period of two years (June 1979 to October 1980).

CASE PRESENTATIONS

CASE ONE

A four month old female Malay baby was admitted to the University Hospital in June 1979 with a one week history of fever, cough and watery diarrhoea about 4-5 times a day for four days. There was no blood in the faeces. The child had vomited all feeds the day before admission and could tolerate only boiled water. On the day of admission the patient developed generalised convulsions lasting about 15 minutes and the

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patient was noticed to be dyspnoeic and cyanosed on crying.

Physical examination revealed a pulse rate of 148/minute and a temperature of 38.4°C. The child was drowsy and mild dehydration was noted. A sinus tract was present on the right side of the neck anteriorly. Crepitations and rhonchi were heard over both lungs especially over the bases and the right apical region. The liver and spleen were both palpable below the respective costal margins.

There were no other abnormal physical findings and investigations done included the following: Haemoglobin 9.4 gm%; white cell count 18,400/cu.mm, 64% neutrophils, 31% lymphocytes, 2% monocytes, 2% atypical lymphocytes; 5% blood urea; serum sodium, potassium, chloride and cerebrospinal fluid examination were within normal limits. A chest radiography showed evidence of minimal pneumonitis of both lower zones.

The baby was given intravenous fluids and penicillin. He made an uneventful recovery and was discharged after three days.

Blood cultures taken on admission showed growth in two bottles after five days and the gram negative rod was tentatively identified as belonging to the genus *Campylobacter*. It was sensitive to tetracycline, chloramphenicol, ampicillin and cephaloridine, but resistant to penicillin and trimethoprim sulphamethoxazole.

CASE TWO

Chinese, male premature infant, birth weight 1530 gms, was noted to have jaundice on the third day of life. Septic spots, which grew *Staphylococcus pyogenes* on culture, were noted on the lower abdomen and pelvis. The serum bilirubin was 10 mg% and he was commenced on phototheraphy and given cloxacillin intravenously. Two days later he developed vomiting and abdominal distension. The blood culture was negative and he made an uneventful recovery when gentamicin was added.

At 4 weeks of age he developed fever and abdominal distension. The next day, diarrhoea, about ten times a day was noted, the stools being yellowish and watery. His weight was then 2 kg and hepatosplenomegaly was present. He developed apnoeic spells and was ventilated electively. However his condition deteriorated further and he died on the 33rd hospital day.

Results of investigations were as follows: Haemoglobin 9.3 gm%, white cell count 8,000/cu.mm with 61% neutrophils, 20% lymphocytes, 18% monocytes and 1% eosinophils. Blood cultures taken during the second episode yielded a growth of *Campylobacter* organisms after five days in one bottle only. The organism was sensitive to erythromycin, chloramphenicol, gentamicin, cephaloridine and kanamycin but resistant to penicillin, tetracycline and trimethoprim sulphamethoxazole.

BACTERIOLOGY

Isolation of the organisms from blood culture was on chocolate agar plates incubated at 37°C in a candle jar. After 48 hours, the growth was fine and the colonies almost pinpoint. The gram stain showed slender gram-negative, spiral or S-shaped organisms with tapering ends. After a few days of culture on solid medium, some of the organisms had degenerated into coccoid forms.

The organisms were plated on chocolate agar and incubated at 42°C in an anaerobic jar containing an activated gas kit (Oxoid), but without the catalyst. This provides, more or less, the special gaseous requirement of 6 % oxygen, 10% carbon dioxide and 85% nitrogen. [2] After 24 hours, the colonies appeared typically flat and glossy with a tendency to spread along the direction of the tracks of the inoculating wire. The oxidase test and the catalase reactions were positive and the organisms were motile when grown in broth culture. The identity of our two isolates was confirmed and species determination as *Campylobacter jejuni* biotype 1 as performed by Dr. M. B. Skirrow of the Royal Worcester Infirmary, U.K.

DISCUSSION

The nomenclature of campylobacteria is now becoming clearer. Those associated with human infections were first described in detail by Elizabeth King as "related vibrio" and shown by her to be thermophilic in that they grew better at 42°C. [5] These enteropathogenic organisms are now placed in the genus *Campylobacter*. At the First International *Campylobacter* Workshop held at the University of Reading, U.K., in March 1981, Skirrow suggested the use of the name *Campylobacter jejuni* pro tem for all nalidixic acid sensitive, thermophilic strains isolated from cases of acute enteritis. [6] The name *C. fetus* has been retained for the classical organisms of 'vibrionic'

abortion of cattle and sheep.

In most early reports the organism was isolated from blood. [7] However with the greater availability of selective media, some laboratories, especially those with a large intake of specimens from general practitioners, isolate *C.jejuni* as the commonest organism from diarrhoeic stools.[8] Unfortunately we did not process the stools of both our patients for *Campylobacter*. There is no doubt that had we looked for it, the chances of isolating it from the faeces would have been very high.

The principal site of infection is the jejunum and ileum but involvement of the colon and rectum is becoming increasingly recognised. [9] The fact that these organisms are sometimes isolated from the blood of infected patients suggests an invasive process. The rigors that some patients experience during the prodromal phase certainly suggests a transient bacteraemia.

The isolation and identification of the organism as a cause of septicaemia by microbiologists is important. Tentative identification is based on its growth characteristics, microscopic and macroscopic, morphology, mortility, positive oxidase test, positive catalase reaction, failure to produce acid from the usual carbohydrates, negative reactions for methyl red, indole or Voges-Proskauer reaction and positive nitrate test.

Campylobacters have rather unusual antimicrobial sensitivities. The antibiotics such as erythromycin, chloramphenicol and gentamicin are the most active compounds. [10] Almost all strains are resistant to penicillin G, lincomycin and trimethoprim. As a group the B-lactam antibiotics have low activity towards *Campylobacter jejuni*. [11] Tetracycline resistance of about 10% has also been reported. [10]

The baby in case one recovered inspite of being treated with penicillin. It is probable that mild cases of *C. jejuni* infections are self-limiting and supportive therapy may be sufficient. The indications for antibacterial treatment are as yet undefined. The outcome in the second case was not so favourable despite treatment with gentamicin, owing to the presence of complications.

The sources of infection and mode of transmission of the bacteria to humans are uncertain. Animals may be important sources and the bacteria are transmitted either directly or probably more often via food. [12] *Campylobacter* is commonly found in cattle, sheep, goats, chickens and turkeys. [13] Dogs with diarrhoea have also been implicated as the source of human infections. [7] The source of infection in our two cases is unknown.

C. jejuni, especially in stools will not be recognized by routine diagnostic procedures for enteric pathogens due to its slow growth and special gaseous requirements. Therefore clinical laboratories, particularly those in children's hospitals should be aware of this organism and include special isolation techniques in their diagnostic procedures.

REFERENCES

[1] Butzler J P, Skirrow M B. *Campylobacter enteritis Clin. Gasteroenterol.* 1979; **8**, 737-765.

[2] Smibert R M. The genus *Campylobacter. Ann. Rev. Microbiol.* 1978; **32**, 673-709.

[3] Guerrant R L, Lahita R G, Winn W C, Roberts R B. Campylobacteriosis in Man. Pathogenic Mechanisms and Review of 91 bloodstream infections. *Am. J. Med.* 1978; **65**, 584-592.

[4] Brown W J, Sautter R. *Campylobacter fetus* septicaemia with concurrent salpingitis. *J. Clin. Microbiol.* 1977, **6**, 72-75.

[5] King E O. Human infections with *Vibrio fetus* and a closely related vibrio. *J. Infect. Dis.* 1957, **101**, 119-128.

[6] Skirrow M B. The taxonomy of *Campylobacter. Culture* 1981, **2**, No. 2.

[7] Skirrow M B. *Campylobacter* enteritis; a "new" disease. *Brit. Med. J.* 1977; **2**, 9-11.

[8] Lauwers S, De Boeck M, Butzler J P. *Campylobacter* enteritis in Brussels. *Lancet* 1978, **1**, 604-605.

[9] Lambert M E, Schofield P F, Ironside A G, Mandal B K. *Campylobacter* colitis. *Brit. Med. J.* 1979, **1**, 857-859.

[10] Karmali M A, Fleming P C. *Campylobacter* enteritis in children. *J. Paediatr.* 1979, **94**, 527-533.

[11] Walder M. Susceptibility of *Campylobacter fetus* subsp. *jejuni* to twenty antimicrobial agents. Antimicrob Agents Chemother. 1979, **16**, 37-39.

[12] Svedhem A, Kaijser B, Sjogren E. Antimicrobial susceptibility of *Campylobacter jejuni* isolated from humans with diarrhoea and from healthy chickens. *J. Antimicrob. Chemother.* 1981, **7**, 301-305.

[13] Bokkenheuser V. *Vibrio fetus* infections in Man. I. Ten new cases and some epidemiological observations. *Am. J. Epidemiol.* 1970, **91**, 400-409.