

# Prevalence And Antibiogram Pattern Of Campylobacter Species Among Acute Gastroenteritis Patients In Our Tertiary Care Hospital, Kanchipuram

Senthamarai. S<sup>1</sup>, Sivasankari. S<sup>1</sup>, Anitha. C<sup>1</sup>, Arunagirinathan. N<sup>2</sup>, Akila.K<sup>1</sup>, Subha.V.J<sup>1</sup>, Anitha.S<sup>1</sup>, Siji Mol.S<sup>1</sup>.

<sup>1</sup> Department of Microbiology, Meenakshi Medical College Hospital & Research Institute, Kanchipuram

<sup>2</sup> Academic Officer, MAHER University, Chennai.

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## Abstract

Campylobacter species are significant cause of acute gastroenteritis in children and adults, worldwide. Campylobacter jejuni is the predominant species reported, both in developed and developing countries. Stool samples were collected and processed for Campylobacter isolation, identification and antibiotic susceptibility testing. Out of 102 diarrhoeal stool samples collected, of which 8 (7.8%) were Campylobacter species. Among this, 7 (87.5%) were C.jejuni and 1(12.5%) was C.coli. Out of 8 Campylobacter isolates, 6(75%) were from female (75%) and 2 (25%) were from male. Out of 8 isolates predominant resistance were noted with Erythromycin (50%), Ciprofloxacin (37.5 %) & Amoxicillin (25%). 12.5 % resistance observed with Gentamycin, Tetracycline & Ceftriaxone. No resistance observed for Chloramphenicol, Cotrimoxazole. Increase of antibiotic resistance among Campylobacter species is alarming as it limits the therapeutic option for treatment.

**Abbreviation:** IBD: Inflammatory Bowel Disease; MCCDA: Modified Charcoal Cefepirazole Deoxycholate Agar; CLSI: Clinical and Laboratory Standards Institute; ATCC: American Type Culture Collection.

## Introduction

Diarrhoeal diseases are very important cause of morbidity and mortality in developing countries. Campylobacter species are significant cause of acute gastroenteritis in children and adults, worldwide. This is a gram-negative bacillus of zoonotic origin, transmitted by ingestion of contaminated water, undercooked meat, poultry and unpasteurised dairy products. Campylobacter jejuni is the predominant species reported, both in developed and developing countries and it is followed by C. coli and C.lari [1]. As per the Global Burden of Disease study 2016, more than 172 million episodes of diarrhoea and 75000 deaths reported worldwide [2]. Though it is self-limiting disease, timely use of antibiotic treatment will reduce the period of illness and prevent further complications such as bacteraemia & the sequelae Guillain Barre Syndrome, IBD [3]. Indiscriminate use of antibiotics in animal husbandry and human population led to an increase of antimicrobial resistance which is of major public health concern. In developing countries, though it is of major health problem, the number of studies and data are very sparse. So, to study the prevalence and susceptibility pattern of Campylobacter species in our area, we aimed to conduct this study.

## RESULTS

Out of 102 diarrhoeal stool samples collected, of which 8(7.8%) were *Campylobacter* species. Among this, 7 (87.5%) were *C.jejuni* and 1(12.5%) was *C.coli*. Out of 8 *Campylobacter* isolates, 6(75%) were from female (75%) and 2 (25%) were from male. Out of 8 isolates predominant resistance were noted with Erythromycin (50%), Ciprofloxacin (37.5 %) & Amoxycillin (25%). 12.5 % resistance observed with Gentamycin, Tetracycline & Ceftriaxone. No resistance observed for Chloramphenicol and Cotrimoxazole.

## DISCUSSION

*Campylobacteriosis* is still one of the most important infectious diseases that is likely to challenge global health in the years to come but there are currently insufficient epidemiological data to provide an accurate assessment of the burden of this infection. *Campylobacter* species has been recognized as a frequent food borne pathogen resulting in diarrhoeal diseases. The frequency of isolation of *C. jejuni* in various parts of the world varies due to the varying standards of living conditions, water supply and feeding habits. *Campylobacter* prevalence rate in diarrhoeal disease from developing countries, range from 5% to 23% [8]. In our study, the prevalence rate of *Campylobacter* species were 7.8%. this is comparable with the studies of Ying Liet al [7 %], Ananthanet al [8%] [9, 10]. In India, the prevalence rate varies from 3.2%. 4.5%, 5.1%, 5.7 %, 11.1 %, 13 % reported in various studies by Naik et al, Rajendran et al, Sinha et al, Ajjampure et al, Sen Gupta et al, Jain et al, respectively [11,12,13,14,15,16]. A very high rate of 40% reported by Piyaliet al [17]. More number of *Campylobacter* diarrhoeal diseases is reported in children less than 5 years. As our sample size is very less, this is not comparable in our study. Female preponderance was noted in my study. The same was reported with the studies of by Md Ashikur Rahman et al [18]. Antimicrobial resistance is an emerging issue in health care field, worldwide. The resistance to erythromycin and ciprofloxacin are of great concern as it is used as first line of therapy in *Campylobacter* infection in patients. The resistance patterns are influenced by pressure exerted by use of antibiotics which again threat to therapeutic option. The emergence of resistance could be attributed to the use of antibiotics in animal husbandry. In our study, 50% of our isolates were resistant to erythromycin and 37.5% & 25% of isolates were resistant to ciprofloxacin and Amoxycillin respectively. 12.5 % resistance observed with Gentamycin, Tetracycline & Ceftriaxone. No resistance observed for Chloramphenicol, Cotrimoxazole. Zorayda et al reported the resistance pattern of Nalidixic acid (75%), Ciprofloxacin (75%) Ampicillin (28.6%) Erythromycin (12.5%) but sensitive to Gentamycin and Amoxicillin -Clavulanic acid. Ciprofloxacin was the predominant resistant drug 77.4% in the study of Schiaffino et al. Higher resistance were noted in the study of Srinivas K et al for Tetracycline and Vancomycin (76%) followed by Ciprofloxacin (68%) and Erythromycin(56%).

## MATERIALS AND METHOD

This prospective study was conducted at Department of Microbiology, Meenakshi Medical College Hospital and Research Institute, Kanchipuram. The study period was, June 2021 to December 2021. Ethical clearance was obtained, from Institutional Ethical Committee. A total of 102 stool samples were collected for the study after obtaining informed consent from all the patients during this study period. All the stool samples were collected in a sterile, wide mouthed container from the patient and transported immediately to the microbiology lab. Samples were inoculated on selective media, Modified Charcoal Cefepazone Deoxycholate Agar base (MCCDA) with CCDA supplement (Hi media) and incubated at 37°C & 42°C under micro aerobic conditions for 48-72 hours. The plates were inspected after 48 hours, for the growth. Colony morphology was observed & Gram staining was done. Gram negative Sea-Gull wing shaped bacilli was observed. Colonies were inoculated on standard biochemical test for the confirmation and for the speciation of *Campylobacter* species. AntibioGram was done using Kirby Bauer disc diffusion method with the following drugs – Tetracycline (30µg), Amoxycillin (30µg), Gentamycin (10µg), Ciprofloxacin (5µg), Erythromycin (30µg), Ceftriaxone (30µg), Cotrimoxazole, Chloramphenicol. Zones of inhibition were interpreted as per CLSI guidelines. *Campylobacter* ATCC 33291 was used as Quality control strain [4, 5, 6, and 7].

## Conclusion

Campylobacter species are very important pathogen causing diarrhoeal diseases in all age group predominantly in children which leads to significant morbidity and mortality and leaves the patients with post infective auto immune sequelae. But there is no National level health programme to control these infections due to the inadequate research and handful knowledge about the true incidence in this area in our country. The emergence of antibiotic resistance makes the scenario more worrisome. Studies evaluating the association of Campylobacter spp. with diarrheal patients in Indian population are scarce. In South India, very limited studies and data are available, especially only very few in our area.

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**Table-1 :** Total cases distribution

Total cases	Positive (%)	Negative (%)
102	8(7.8%)	94(92.2%)

**Table- 2:** Distribution of species

Total cases (n=8)	Number of isolates	Percentage (%)
C. jejuni	7	87.5%
C.coli	1	12.5%

**Table -3:** Sex distribution

Total cases (n=8)	C. jejuni	C.coli	Total (%)
Male	2	0	2 (25%)
Female	5	1	6 (75%)

**Table-4:** Antibiotic susceptibility pattern of Campylobacter species

Total (n=8)	Sensitive	Percentage	Resistance	Percentage
Erythromycin	4	50	4	50
Ciprofloxacin	5	62.5	3	37.5
Amoxicillin	6	75	2	25
Ceftriaxone	7	87.5	1	12.5
Gentamycin	7	87.5	1	12.5
Cotrimoxazole	8	100	0	0
Chloramphenicol	8	100	0	0
Tetracycline	7	87.5	1	12.5