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Original Research Article

Campylobacteriosis is an Allied Disease in the Elderly

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Abstract: In this study we analysed campylobacteriosis cases in a tertiary care hospital of India to find out this is an isolated disease or an allied disease with comorbidities in elderly people. In all the four elderly cases, acute gastroenteritis by *Campylobacter* appears to be a contributory condition of the disease besides other associated diseases. Perceptive the link between this disease and comorbidities is crucial for effective prevention, early detection, and thorough care, in elderly populations with underlying health problems.

Keywords: Campylobacteriosis, elderly people, comorbidities.

INTRODUCTION

Campylobacteriosis is a gastroenteritis caused by pathogenic *Campylobacter* species and an important public health issue. *Campylobacter* spp. are small, curved, Gram-negative rods [4]. The major pathogens are *C. jejuni*, *C. coli*, and *C. fetus*. *Campylobacter* spp. are a large and diverse collection of gram-negative bacteria that includes roughly 26 species, at least 10 of which are known to cause human sickness. The taxonomy of the genus *Campylobacter* has been extensively revised; currently, the immediate family is that of Campylobacteriaceae, which includes three distinct genera: *Campylobacter*, *Arcobacter and Helicobacter* [6]. The mechanisms responsible for the pathogenesis and susceptibility to Campylobacter are not entirely established; nevertheless, the virulence of the strain, the number of organisms swallowed, and host immunity is known to contribute to disease progression [5]. Although campylobacteriosis is well recognised and regarded as a foodborne disease, it can also be spread by contact with colonised animals, polluted settings with animal waste, or inadequate hygiene. Cross contamination during food processing is considered a key transmission route [9].

According to global data, campylobacteriosis is the main cause of bacterial gastroenteritis, which has substantial public health implications. In affluent countries, the frequency of campylobacteriosis among senior people has been rising, owing to improved detection technologies and an ageing population.

Older adults (aged ≥65 years) are more susceptible than younger adults to certain enteric infections such as invasive *Campylobacter [1]*. Older persons are also more prone to severe illnesses that require hospitalisation, long-term consequences, or death. Several age-related factors, including immune system weakness, changes to the gastrointestinal tract, a higher incidence of comorbid illnesses, and more frequent use of antacids and immunosuppressants, may contribute to older persons' increased susceptibility to and severity of disease. Older persons have the highest rates of gastrointestinal hospitalisations and mortality [2]. Rapid detection of enteric infections in older persons can lead to better results by delivering timely and appropriate treatment. However, early diagnosis of enteric infections in older persons is difficult since usual illness signs and symptoms may be rare or missing [3]. Understanding the clinical signs and symptoms among older adults with enteric infections could improve the timeliness and accuracy of clinical diagnoses, thereby improving patient outcomes and increasing the number of cases diagnosed and reported to surveillance [2].

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MATERIALS AND METHODS

A descriptive retrospective study of patients who presented with a *Campylobacter* infection in a tertiary care hospital located in India was conducted. Details of four patients who had campylobacteriosis were taken from hospital records and their clinical histories are discussed here. Data were anonymised, as per the guidelines of the hospital ethical committee. Furthermore, patients' medical records were reviewed to gather information about sociodemographic data, comorbidities, clinical symptoms, treatment, and outcomes.

Microbiological Investigation

The presence of *Campylobacter* in hospital patients was detected using the BioFire FilmArray Gastrointestinal (GI) Panel, from stool samples of the patients. Fresh stool samples were collected from patients using sterile containers. The samples were stored at 2-8°C and tested within 24 hours. The FilmArray GI Panel provided a comprehensive report identifying various gastrointestinal pathogens, including *Campylobacter* species. Positive results for *Campylobacter* indicated the presence of the pathogen's DNA in the sample.

Data Analysis

For all culture-confirmed cases of *Campylobacter* and respondents reporting acute gastroenteritis, the cases reporting diarrhoea, fever, vomiting, and abdominal pain or cramps were analysed. Additional characteristics, such as electrolyte levels, WBC count, neutrophil percentage, CRP level, and haemoglobin level were also analysed including the history of the patients and comorbidities, which were also studied.

RESULTS

Among the 4 patients with *Campylobacter*, 2 were men and 2 were women. Their median age was 68, and all were above 40 years old. All the four patients were hospitalised during their treatment.

Patient 1, being a 93-year-old male, presented with drowsiness, low oxygen saturation and low urine output. He had comorbidities like plasma cell dyscrasia, iron deficiency anaemia, obstructive sleep apnea, hypertension, dyselectrolytemia and heart failure with preserved ejection fraction. His blood haemoglobin was 11.1 g/dl, total leucocyte count was 15030/cu mm, neutrophil was 84%, platelet was 141000/cu mm, ESR 40 mm, sodium was 129 mEq/l, CRP was 68 mg/ml. With biofire, the *Campylobacter* gene was detected in the stool. The patient was treated for chest infection with reactive bronchospasm, with type II respiratory failure, Acute gastroenteritis and hyponatremia.

Patient 2 was a 62-year-old female who was suffering from persistent diarrhoea along with incontinence of stool and urine. The patient was anaemic with low electrolytes and WBC count. Stool culture examination showed an alkaline nature, with presence of weakly positive occult blood, and occasional pus cells and RBCs. Biofire examination of stool revealed Campylobacter, Enteroaggregative *E. coli* and Enteropathogenic *E. coli* genes. Other parameters were normal. The patient was treated for acute infective diarrhoea.

Patient 3, a 74 years old female was suffering from diffuse abdominal pain and frequent passage of loose stools. She had comorbidities like type 2 diabetes mellitus, hypertension, hypothyroidism, dyslipidaemia, drug-induced parkinsonism. Her investigations revealed marked leucopenia with relative increase of neutrophilic leucocytes, and decreased sodium and magnesium levels. BioFire revealed Campylobacter gene in the stool. However, a biopsy examination of the colon indicated a diagnosis of ulcerative colitis. The patient was treated for colitis with campylobacter superinfection.

Patient 4, a 41-year-old male patient was suffering from periumbilical pain radiating to the back along with vomiting and diarrhoea. Total leucocyte count was high with increased neutrophil (94%). Sodium was low. BioFire examination of the stool revealed the presence of *Campylobacter*, *Plesiomonas*, *Vibrio*, Enteroaggregative *E. coli*, Enteropathogenic *E. coli* and Norovirus genes. The patient was treated for acute gastroenteritis.

Patient	Age (Yrs)	Sex	Origin of *Campylobacter* Isolates	Symptoms	Comorbidities	Outcome
1.	93	M	Stool Sample	Drowsiness, low oxygen saturation and low urine output	Plasma cell dyscrasia, iron deficiency anaemia, obstructive sleep apnea, dyslectrolytaemia, heart failure preserved ejection fraction	Favourable
2.	62	F	Stool Sample	Persistent diarrhoea along with	Anaemic with low electrolytes and WBC count	Favourable

				incontinence of stool and urine.		
3.	74	F	Stool Sample	Diffuse abdominal pain and frequent passage of loose stools	Type 2 diabetes mellitus, hypertension, hypothyroidism, dyslipidaemia, drug-induced parkinsonism. Her investigations revealed marked leucopenia with a relative increase of neutrophilic leucocytes, decreased sodium and magnesium levels	Favourable
4.	41	M	Stool Sample	Periumbilical pain radiating to back along with vomiting and diarrhoea	Total leucocyte count was high with increased neutrophil	Favourable

DISCUSSION

The link between campylobacteriosis and various comorbidities is strong, especially in vulnerable groups. Individuals with HIV/AIDS have an increased chance of developing severe campylobacteriosis due to their weaker immune systems. In some people, the infection may be more chronic and difficult to cure. Patients undergoing chemotherapy or with some forms of cancer have compromised immune systems, rendering them more vulnerable to serious infections and consequences from campylobacteriosis. Diabetic individuals have a weakened immune system and impaired gastrointestinal function, making them more susceptible to infections, including *Campylobacter*. Kidney and liver problems can weaken the immune system and increase susceptibility to infections. Patients with IBD, such as Crohn's disease and ulcerative colitis, may be at a higher risk of campylobacteriosis due to compromised gut immunity and frequent use of immunosuppressive medications [7]. While cardiovascular disorders may not directly increase the risk of campylobacteriosis, they can complicate the treatment of severe dehydration and other consequences caused by severe Campylobacter infection. Individuals with campylobacteriosis may have co-infections with other bacteria such as *Salmonella*, complicating diagnosis and treatment. In all the four cases, acute gastroenteritis by Campylobacter appears to be a contributory condition of the disease besides other associated diseases. Understanding the link between campylobacteriosis and comorbidities is critical for effective prevention, early detection, and thorough care, particularly in populations with underlying health problems.

CONCLUSION

The clinical spectrum of *Campylobacter* varied from watery diarrhoea without blood to severe inflammatory diarrhoea with abdominal pain and fever [8]. The disease appears to be less severe in elderly patients with favourable outcomes on treatment. However, further study is needed to establish the association of *Campylobacter* infection with other diseases.

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DECLARATIONS

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Conflict of Interest: There is no competing interest of any Author in this manuscript.

Ethical Approval: Hospital records without any identity of the patients as used in this study were done as per Institutional Ethical Committee guidelines.

Authors' Contribution: All Authors are equally contributed in the manuscript.

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