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Campylobacter: The Silent Menace in our Food Supply

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ABSTRACT

Campylobacter is a noticeable bacterial pathogen that is frequently involved with foodborne diseases across the world. The presence, prevalence, and consequences of *Campylobacter* in the food supply are investigated in this abstract. *Campylobacter (C.) coli* and *C. jejuni* are the most frequently encountered species responsible for human infections, primarily causing gastroenteritis. Poultry, particularly raw or undercooked chicken, is a primary cause of *Campylobacter* contamination, but unpasteurized milk and polluted water are also potential source**s.**

Keywords: Campylobacteriosis, *Campylobacter jejuni*, Foodborne Illness, Guillain Barre Syndrome

Introduction

Campylobacter is a gram-negative, microaerophilic genus of bacteria of the family Campylobacteraceae. C. *coli* and *C. jejuni* are the two most common pathogenic bacteria that cause diarrheal illnesses in humans, claiming 33 million lives each year [1]. *C. jejuni* is found in a wide range of animal species, primarily as a commensal bacterium. Handling raw chicken meat and cross contamination of ready-to-eat food, in addition to improperly cooked chicken meat, are major sources of infection in humans. Since birds have an average core temperature of 41°C to 42°C and can carry *C. jejuni* without getting sick, the bacterium appears to be well adapted to them. *C. jejuni* grows best at these levels of temperature [2]. The incubation period (the time between exposure and symptom start) after *C. jejuni* exposure is normally 2 to 5 days, but it can vary. Diarrhea (sometimes bloody), abdominal pain, fever, nausea, and vomiting are all symptoms of *Campylobacter* infection. Long term exposure to this organism can cause Guillain-Barre Syndrome (GBS) [3]. *C. jejuni* infection is often diagnosed through laboratory testing of stool samples to detect the presence of the bacteria [4]. The bacteria may be cultured or tested using molecular methods such as polymerase chain reaction (PCR). One of the most prevalent zoonotic diseases with bacterial sources globally is Campylobacteriosis. Campylobacteriosis was the most prevalent bacterial zoonosis recorded in the European Union (EU) in 2020, with 120,946 confirmed cases, followed by salmonellosis (52,702 cases) and yersiniosis (5668 cases) [5].

Transmission of Organism

Campylobacter infection occurs after someone eats raw or undercooked poultry or another food like unpasteurized dairy products. After being ingested by humans, *C. jejuni* enters the viscous mucin-coated intestinal crypts of the lumen [6]. Several other aggressors, including stomach acid, deteriorating enzymes, poisons, and invading pathogens, are prohibited from infiltrating the underlying epithelium by this protective layer, which is composed of a hydrated network of extremely glycosylated proteins. *C. jejuni* enters and colonies the mucin layer, finally making contact with and penetrating intestinal epithelial cells. *C. jejuni* uptake or invasion into the intestinal epithelial cell is thus dependent on certain host cell features. Microtubule and actin structures are hypothesized to be required for effective invasion depending on the cell type invaded [7]. The thrombocytopenia and reduced platelets aggregation enhance the risk of bleeding [8,9].

Sign and Symptoms

People with *Campylobacter* infection usually have diarrhea (often bloody), fever, and stomach cramps. Nausea and vomiting may accompany the diarrhea [10]. These signs and symptoms often appear 2 to 5 days after encountering *Campylobacter* and remain for about a week. Complications involving *Campylobacter* infections can sometimes lead to arthritis, irritable bowel syndrome, and transient paralysis [11]. *Campylobacter* often spreads to the bloodstream and generates a life-threatening illness in patients with compromised immune systems, such as those with a blood disease, AIDS, or receiving chemotherapy. Long term exposure causes GBS that leads to ascending paralysis means it first involves lower limb fingers and toes towards the torso. Loss of reflexes is usually found.

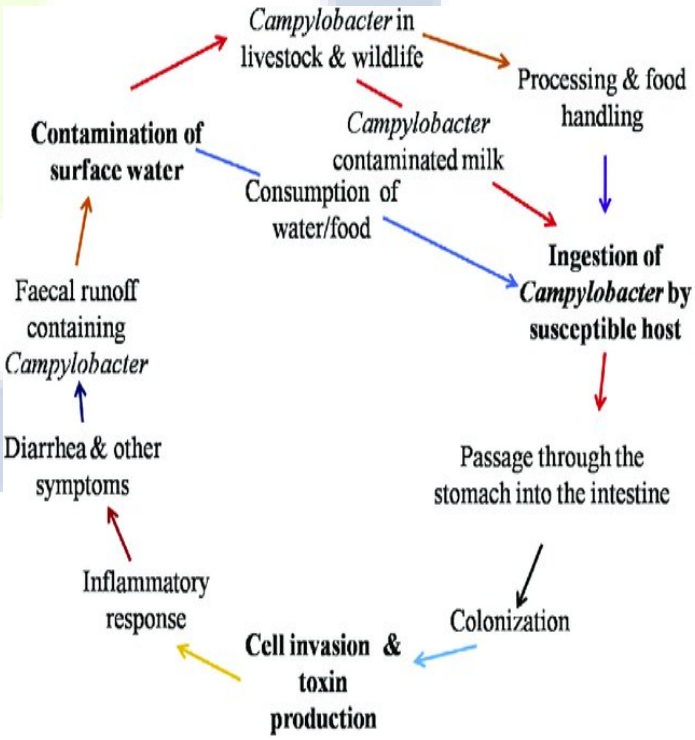

Fig 1: This cycle represents the transmission from source to the target

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Preventive Measures

The Campylobacteriosis management strategy encompasses

- Hand washing is an effective method of preventing Campylobacteriosis
- Keeping your kitchen and food preparation spaces clean
- Unpasteurized milk should be avoided
- Cook your meals at appropriate temperatures
- When dealing with animals, practice caution
- When swimming, take precautions

Management Aspects of *Campylobacter*

Campylobacter infections are often self-limiting and mild. Hydration and electrolyte replacement are the primary goals of therapies in healthy people. Depending on the severity of the sickness and the degree of dehydration, hydration may be oral or parenteral. Ant motility agents should be avoided as they can slow infection resolution [12]. Antibiotics are seldom employed to treat healthy individuals. Antibiotics should be investigated by individuals who are at high risk, such as the immune-compromised and the elderly. Antibiotics may also be required for those suffering from more serious illnesses, such as fever, bloody stools, or severe stomach pain. Patients with impaired immune systems may require numerous doses of antibiotics.

Conclusion

Finally, this paper provides an overview of *Campylobacter* in the food system, focusing on its origins, transmission routes, detection and control issues, and safety issues. To improve food safety practices and preserve public health, a comprehensive and interdisciplinary approach involving scientific research, regulatory measures, and consumer education is required.

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