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Campylobacter Upsaliensis Gastroenteritis: A Case Report

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Abstract | **Case Report**

Introduction: Gastroenteritis is a major public health issue, especially in developing countries where it is associated with high morbidity and mortality. Numerous infectious agents can be implicated. Among them, *Campylobacter upsaliensis* is an emerging zoonotic pathogen, rarely isolated in humans, but capable of causing gastroenteritis or bacteremia. Through the observation of an isolated case in the bacteriology laboratory of the Mohammed V Military Teaching Hospital, we report the involvement of *C. upsaliensis* in human pathology. ***Patient and Observation:*** Ms. S.H., 34 years old, followed for common variable immunodeficiency and receiving immunoglobulin therapy, was admitted for continuation of her substitution treatment. She had been presenting chronic watery diarrhea and recurrent infections following the discontinuation of corticosteroid therapy initiated for a systemic granuloma. During hospitalization, she developed acute diarrhea. Clinical examination revealed hepatosplenomegaly. Laboratory tests showed anemia, lymphopenia, cholestasis without cytolysis, hypoproteinemia, and hypogammaglobulinemia. Stool culture isolated *Campylobacter upsaliensis* and *Candida albicans*. She was treated with erythromycin, with favorable clinical outcome. ***Results:*** Clinically, *C. upsaliensis* mainly causes mild, self-limiting gastroenteritis, but can also lead to severe conditions such as bacteremia, neurological or renal syndromes, and unusual infections. Acute diarrhea represents a major public health issue due to its high prevalence and significant impact on morbidity and mortality, particularly among immunocompromised individuals and individuals at the extremes of age. Among the bacterial pathogens involved, *Campylobacter* holds a prominent position. *Campylobacter upsaliensis*, an emerging species, is primarily transmitted to humans through contaminated food or direct contact with carrier dogs and cats. Microbiologically, it is a fastidious, motile, Gram-negative bacillus, isolated using selective media such as Karmali agar, and identified through biochemical, molecular, or mass spectrometry methods. Its underdetection may be explained by its sensitivity to antibiotics commonly used in conventional culture media. Clinically, *C. upsaliensis* is most often responsible for mild, self-limiting gastroenteritis, but it can also cause severe manifestations such as bacteremia, neurological or renal syndromes, as well as unusual infections. ***Conclusion:*** Gastroenteritis remains a major public health concern, with significant morbidity and mortality among at-risk patients. This report highlights the clinical importance of *C. upsaliensis* and identifies it as an emerging pathogen, potentially associated with a disease spectrum similar to that described for *C. jejuni*.

Keywords: gastroenteritis; *Campylobacter upsaliensis*; Karmali medium; emerging pathogen.

INTRODUCTION

Gastroenteritis is a major public health problem, with significant morbidity and mortality, particularly in developing countries. A wide range of infectious agents are involved in these gastrointestinal infections. *Campylobacter upsaliensis* is an emerging zoonotic pathogen, infrequently identified in humans. It is primarily associated with cases of gastroenteritis and, in some instances, bacteremia. The aim of this work is to report the role of *Campylobacter upsaliensis* in human pathology through the observation of an isolated case in the bacteriology laboratory of the Mohammed V Military Teaching Hospital.

PATIENT AND CLINICAL OBSERVATION

Ms. S.H., a 34-year-old woman, has been followed since 2016 for common variable immunodeficiency, managed with immunoglobulin replacement therapy. She also presents with a systemic granuloma related to this deficiency, previously treated with corticosteroids, which were discontinued a year ago. Since stopping corticosteroid therapy, she has presented chronic watery diarrhea, general health

deterioration, and recurrent infections. The patient was admitted to our department for continuation of intravenous immunoglobulin replacement therapy (Tegeline) at a dosage of 500 mg/kg every three weeks. During this hospitalization, she developed an episode of acute, non-bloody, non-mucoid diarrhea, prompting a stool culture.

On admission, clinical examination revealed a stable patient with abdominal distension and hepatosplenomegaly. Laboratory tests showed normochromic normocytic anemia with hemoglobin at 9.9 g/dL, lymphopenia at 884/mm³, hepatic cholestasis without cytolysis, hypoproteinemia at 54 g/L, an inflammatory syndrome, and reduced total IgG levels. Radiological imaging revealed homogeneous hepatosplenomegaly associated with coeliomesenteric lymphadenopathy.

A stool culture was performed. Macroscopic examination revealed watery diarrhea, while microscopic analysis showed no white or red blood cells, an imbalanced bacterial flora, and abundant non-budding yeast. Inoculations were performed on several selective media: SS agar for systematic detection of *Salmonella* and *Shigella*; CIN agar (Cefsulodin, Irgasan, Novobiocin) for *Yersinia* spp.; Karmali agar for *Campylobacter* spp.; Sabouraud agar for yeasts; and enrichment in Selenite broth.

After incubation, fine greyish colonies were isolated on Karmali agar (Figure 01). Gram staining revealed thin, curved, Gram-negative bacilli suggestive of the *Campylobacter* genus (Figure 02), and the species was confirmed using the API Campylo identification system. In parallel, growth was observed on Sabouraud agar, with the yeast identified as *Candida albicans* based on germ tube formation.

The antibiogram showed that *Campylobacter* was sensitive to erythromycin and amoxicillin-clavulanic acid, and resistant to tetracyclines (Figure 03). The patient was treated with erythromycin, resulting in a favorable clinical outcome.

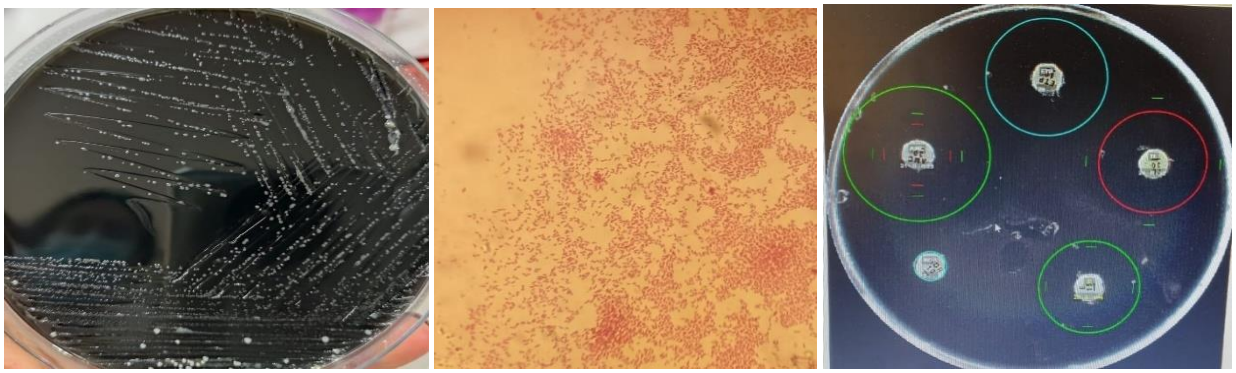

Figure 1: Macroscopic appearance of colonies on Karmali agar
Figure 2: **Microscopic appearance of bacteria under 100× optical microscope**
Figure 3: **Antibiogram of *Campylobacter upsaliensis***

DISCUSSION

Acute diarrhea constitutes a major public health issue due to its high prevalence and significant impact on morbidity and mortality, particularly among individuals at the extremes of age and immunocompromised patients. The incidence of *Campylobacter* infections has significantly increased in recent years, to the extent that they are now recognized as the leading cause of bacterial gastrointestinal infections worldwide [1].

Among emerging species, *Campylobacter upsaliensis* is increasingly being identified as a pathogenic agent involved in various human diseases. Its main reservoirs are dogs and cats, whether asymptomatic carriers or ill, with transmission to humans occurring primarily through contaminated food or direct contact with infected animals [2-4].

Campylobacter upsaliensis is a Gram-negative, thermotolerant bacillus, with a curved or spiral shape. It is non-spore-forming, non-encapsulated, and measures approximately 0.2 to 0.8 µm in diameter and 0.5 to 5 µm in length. It is motile due to polar flagella and grows preferentially under microaerophilic conditions. On Karmali agar, it forms smooth, pinpoint, greyish or translucent colonies. Culture on selective media remains the method of choice for isolating *Campylobacter* from stool samples. Karmali agar is commonly used for this purpose, alongside other media such as Campylosel and Skirrow selective medium.

Precise species identification can be achieved using miniaturized biochemical galleries such as API Campy® (bioMérieux), which evaluate around twenty specific biochemical characteristics. *C. upsaliensis* typically shows the following profile: oxidase positive, nitrate reductase positive, and hippurate negative. It is sensitive to nalidixic acid and generally to cephalothin. The presence of these antibiotics in certain selective media, such as Skirrow, may contribute to the underdetection of *C. upsaliensis* in clinical specimens.

In addition to conventional culture, *Campylobacter* diagnosis can also rely on molecular techniques such as PCR, MALDI-TOF mass spectrometry, and immunoenzymatic or immunochromatographic methods.

Clinically, *Campylobacter* is responsible for a wide range of manifestations. Acute gastroenteritisoften associated with bloody diarrheais the most common presentation. Extraintestinal manifestations, such as septicemia, may also occur.

Although *C. upsaliensis* is most often associated with mild, self-limiting diarrhea [5], severe forms have been reported, including episodes of bloody diarrhea, bacteremia, Guillain-Barré syndrome, and hemolytic uremic syndrome [6-8]. The bacterium has also been isolated in unusual contexts, such as breast abscesses, hepatic cysts, and feto-placental material following spontaneous abortion [9-11].

CONCLUSION

Gastroenteritis is a common infection that can become life-threatening in vulnerable individuals, with a wide variety of causative pathogens involved. This report highlights the clinical significance of *C. upsaliensis* and identifies it as an emerging pathogen, seemingly associated with a disease spectrum similar to that described for *C. jejuni*.

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