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CLOSTRIDIUM DIFFICILE INFECTION - ANALYSIS OF RISK FACTORS IN CONSTANTA

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ABSTRACT

It has been estimated that the human gut contains about 1,000 species of bacteria and 100 times more genes than are found in the human genome. Over 2 Kg - as weight. It is the human microbiom that form a true "forgotten organ" of our body.

Due to the abuse of antibiotics, the Clostridium difficile infection became one of the top nosocomial infections due to complications and financial pressure on the medical system.

We conducted a prospective study of the characteristics of risk factors and epidemiological aspects in patients with Clostridium difficile infection admitted to the Clinical Hospital for Infectious Diseases from Constanta for a period of 3 years. Demographics (age), risk factors (surgery, history of antibiotics or proton pump inhibitors, comorbidities) were noted. The classes of antibiotics used, other than the basic treatment of the condition were analyzed. Also the source of the infection including the ward were the patient was previously hospitalized.

47% (104) of the patients were in the 60-80 interval of age. Nearly half of the patients had a history of surgery. Only 52 patients out of a total of 221 had no history of antibiotic therapy. More than half had PPI therapy prior to the onset of CD infection. In terms of comorbidities, they are multiple, at different systems, the most common being cardiovascular, nutritional and renal diseases. The source of infection was found as nosocomial in 65% of patients. Regarding the origin of the hospital wards, the surgical departments were the main ones in which CD infections appeared: General Surgery (46), Orthopedics (33) and Urology (13).

Our study results confirm that reported risk factors are advanced age, antibiotics use, proton pump inhibitors administration, comorbidities and exposure to health care sistem.

Keywords: Clostridium Difficile, recurrence, risk factors, human microbiom

Introduction

The main protection against CDI is the normal integrity of the intestinal microflora (1).

Age over 65 years old, prolonged hospitalization and antibiotic treatments are the main risk factors for CDI (2).

After the age of 65, the risk of CDI increases 5 to 10 times (3).

Clostridium difficile is the leading cause of infectious diarrhoea in hospitalized patients (4).

These infections lead to prolonged hospitalizations, increased morbidity and mortality, and high health care costs.

Materials and Methods

The current study concerns the epidemiological aspects on a group of 221 patients with enterocolitis with Clostridium Difficile hospitalized in the Clinical Hospital of Infectious Diseases Constanta.

The study is prospective, lasting 3 years, using inclusion and exclusion criteria and a form for collecting the information considered necessary.

Inclusion criteria:

- adult patients over 18 years of age
- with diagnosis at discharge of diarrhea with Clostridium Difficile

- with bacteriological tests positive for CD (toxins, cultures) or negative but in the presence of a high clinical suspicion.

Exclusion criteria:

-patients under 18 years of age

-with a diagnosis of diarrhea of unspecified or specified etiology other than Clostridium difficile.

Data were collected (analytical file) on risk factors: age> 60 years, contact with the health system, surgery, previous antibiotic therapy, comorbidities, the infection origin, the ward of the previous hospitalization.

Results:

Most patients were in the 60-80 age group (47%). Age over 60 is considered a risk factor for Clostridium difficile infection.

In 106 patients we find a recent surgery (less than 3 months).

The most common antibiotics incriminated were cephalosporins (52), fluoroquinolones (48), other betalactams (35).

The most common comorbidities were cardiovascular (67), nutritional (47) and renal (44) diseases.

The source of infection was found to be nosocomial in 145 of the patients (65%), 73 (33%) in the community.

The wards origin in most cases were General Surgery (46), Orthopedics (33), Urology (13) followed by the medical departments of Internal Medicine (10), Pulmonology (10) and Infectious Diseases (8).

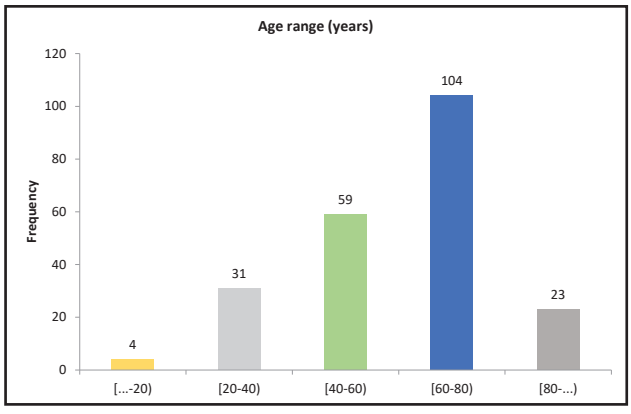

Figure 1 The distribution of patients analyzed according to age at diagnosis

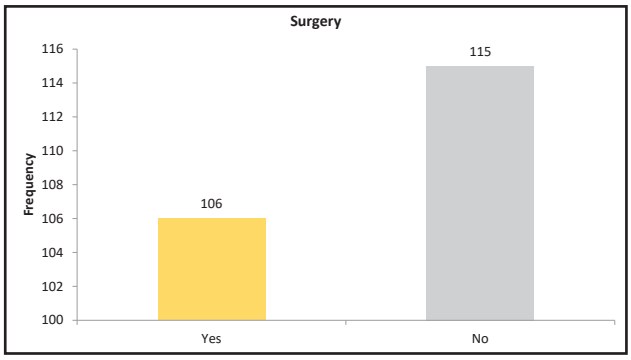

Figure 2 Distribution of patients according to surgery as a risk factor

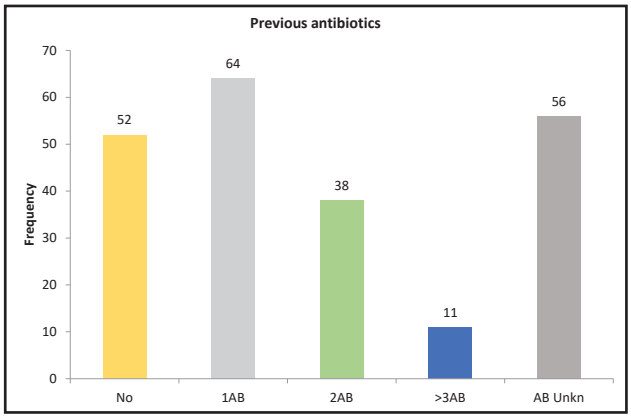

Figure 3 Distribution of patients according to use of antibiotics as a risk factor

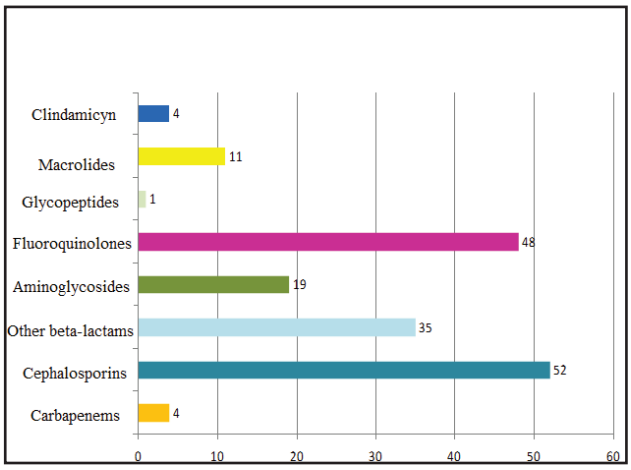

Figure 4 Distribution of patients according to use of different classes of antibiotics as a risk factor

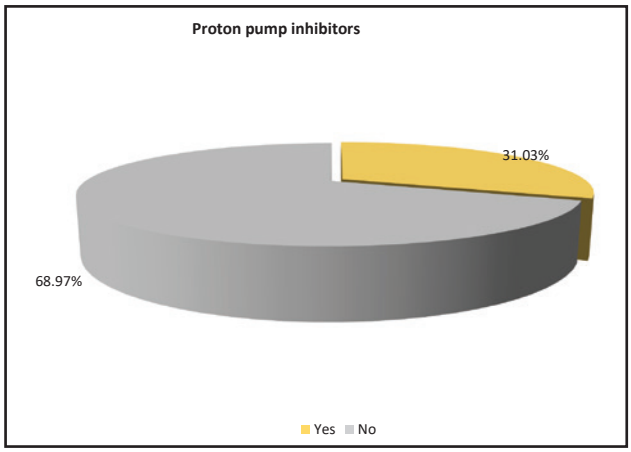

Figure 5 Distribution of patients according to use of proton pump inhibitors as a risk factor

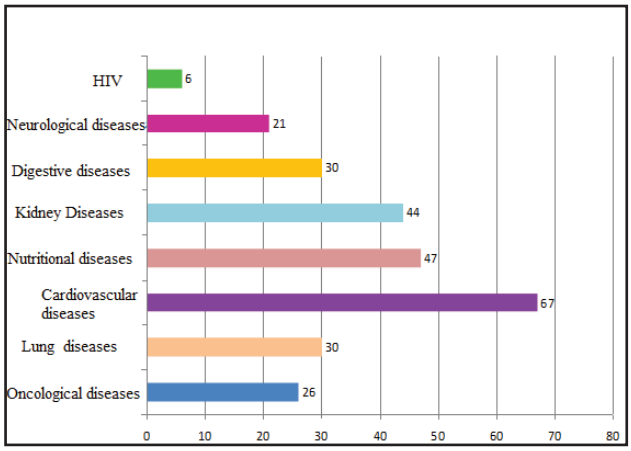

Figure 6 The distribution of patients analyzed according to comorbidities at diagnosis

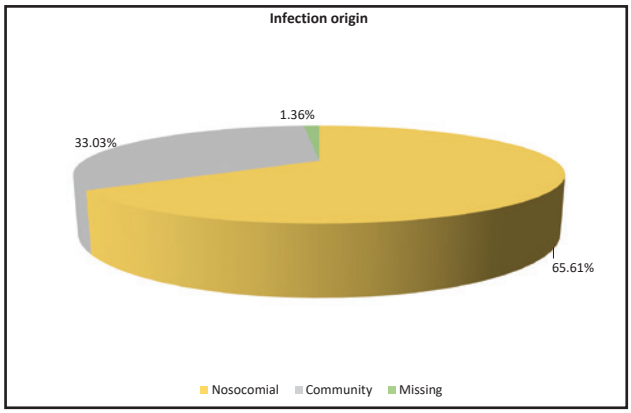

Figure 7 Repartition by the source of the infection

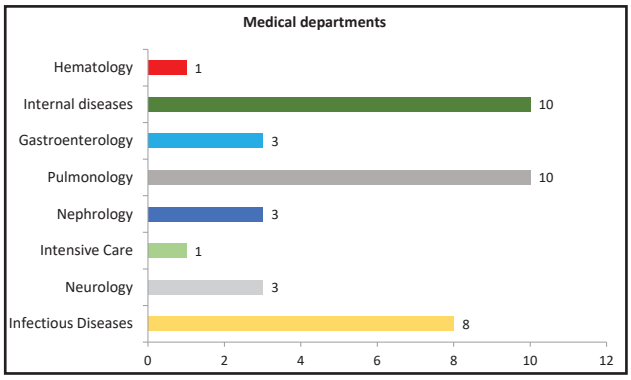

Figure 8 Repartition by wards origin of the infection

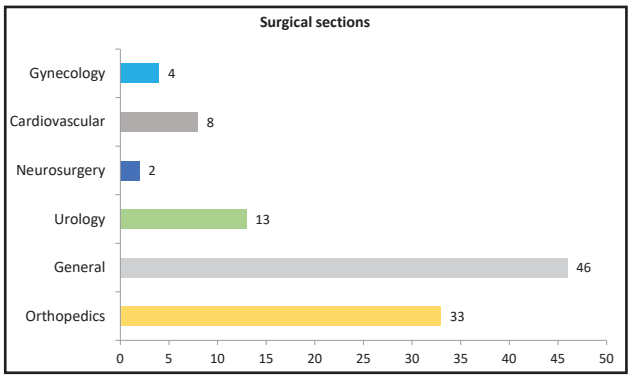

Figure 9 Repartition by wards origin of the infection

Discussions:

The primary requirement for the expression of the pathogenicity of toxigenic strains of C. difficile is a change in the normal relations of the bacteria colonizing the digestive tract, which constitute a barrier to the proliferation of pathogenic microorganisms. More than 90% of infections caused by C. difficile occur upon the administration of antibiotics. The effects of antibiotics disrupt the normal flora of the colon, allowing endogenous and exogenous microorganisms (C. difficile) to proliferate and colonize the colon (5,6).

According to data from previous studies, 70-90% of diseases caused by C. difficile develop after the administration of antibiotics (4,7).

Most studies that evaluated CDI showed that older patients (especially those over 60) had the highest risk of developing CDI In a study by Al-Eidan et al (8) 87 of their hospitalized patients with CDI had severe underlying diseases and the presence of two or more simultaneous diseases was found in 21 patients (24.1%). Also in their study, Kyne et al. (9) found that CDAD was

associated with severe comorbidities (OR = 17.6; 95% C.I. = 8.8-53.5).

Conclusions

Our study highlighted that several risk factors for the development of CDI were identified (old age, applied antibiotic therapy and proton pump inhibitors, surgery, comorbidities, recent stay at a hospital).

Because CDI outbreaks are often multifactorial in terms of cause, the prevention and control of outbreaks must involve multiple interventions aimed at improving antimicrobial use across the health care system and in individual patients (10).

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