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CLOSTRIDIOIDES DIFFICILE INFECTION IN HOSPITALIZED PATIENTS: INCIDENCE, RISK FACTORS, AND ANTIBIOTIC ASSOCIATION

Introduction

Clostridioides difficile infection (CDI) is one of the most common healthcare-associated infections, leading to significant morbidity and mortality worldwide. It typically occurs after exposure to broad-spectrum antibiotics that disrupt the normal gut microbiota, allowing proliferation of toxigenic C. difficile strains. In Europe, CDI incidence remains a major indicator of infection control and antimicrobial stewardship performance. Recent reports suggest a resurgence of cases following increased antibiotic use during the COVID-19 pandemic, highlighting the need for continuous surveillance and appropriate antibiotic policies [1–5].

Goal

To assess the incidence and clinical risk factors associated with Clostridioides difficile infection in hospitalized patients, and to analyze its correlation with prior antibiotic exposure.

Material and Methods of research

A retrospective descriptive study was conducted using hospital infection surveillance data from 2019 to 2023 in Ireland. Cases of laboratory-confirmed CDI were identified through stool toxin assays (EIA for toxins A/B and PCR for toxin genes). Patient demographics, comorbidities, and antibiotic exposure history were analyzed. Antibiotic classes were grouped as cephalosporins, fluoroquinolones, clindamycin, carbapenems, and others. Data were summarized using descriptive statistics, and associations were presented in tabular and graphical form.

The results of the research and their discussion

Table 1 – Annual incidence and outcomes of Clostridioides difficile infection in hospitalized patients, 2019–2023

Year	Total Hospital Admissions	CDI Cases	Incidence (per 10,000)	Case Fatality (%)
2019	45,230	132	2.9	6.8
2020	39,870	120	3.0	7.5
2021	42,110	146	3.5	7.1
2022	44,890	158	3.5	6.9
2023	46,500	161	3.4	6.2

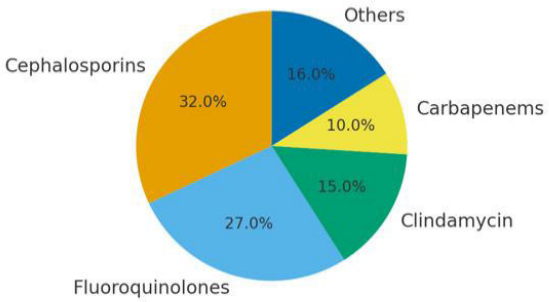

Figure 1 – Antibiotic classes associated with Clostridioides difficile infection (percentage of total cases)

The rise in CDI cases and incidence seen in Table 1 is likely related to the improved diagnosis and early detection. In the recent years especially after COVID-19 hospitals have adapted to PCR based and toxin EIA tests resulting in more cases detected that might have been missed before, also another contributor is the COVID-19 panedemic that prolonged hospital stays of patients especially patients at a higher risk. The decrease in fatality rates can also be linked to early diagnosis which results in an earlier initiation of treatment e.g vancomyocin and other causes can be, improved clinical management and better infection contol and isolation.

Conclusions

Clostridioides difficile infection continues to represent a significant hospital-acquired infection in Ireland. High-risk antibiotic classes such as cephalosporins and fluoroquinolones remain the leading contributors to CDI. Effective antibiotic stewardship, rapid diagnostic testing, and strict hygiene measures are essential to control incidence and improve outcomes.

LITERATURE

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