

## **The Role of the Nurse in the Control and Management of Patients with Clostridium Difficile**

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### **Abstract:**

Clostridioides Difficile is one of the most important intrahospital pathogens. This sporogenous anaerobic bacterium is increasingly isolated from feces, primarily in older hospital patients on antibiotic therapy, and is associated with several clinical manifestations, starting with diarrhea and ending with pseudomembranous colitis. The main emphasis in this paper is the prevention of these bacterial infections, and the initial protection of patients who are suspected of CDI (Clostridium Difficile Infection) mandates that they should be immediately isolated from other patients. In hospital settings where the existence of CDI has been detected, special wards must be opened in order to isolate a larger group of patients. Practically, the isolation of both individual patients and groups of patients has a major role in reducing transmission and bringing the epidemic under control.

The role of the nurse in the prevention, control and therapy of patients who have Clostridioides Difficile Infection is crucial. It certainly implies that education and knowledge about this problem is essential.

### **1. Introduction**

Clostridium, a term that comes from the Greek word (klōstēr) meaning "spindle" are gram positive, anaerobic bacteria from the family Clostridiaceae, that have the ability to form spores and the most of them are pathogenic. According to the pathogenesis, clostridia endospores are resistant to heat and can survive several hours in boiling water, and some of them can survive even a heat of 110°C for a period of one hour. Some of the clostridia can move by means of peritrichously arranged flagella. They can be found in the soil and the digestive system of animals.

Clostridium Difficile, by definition, is the cause of antibiotic-induced inflammation in the intestines. As one of the most important intrahospital pathogens, this sporogenous anaerobic bacterium is detected in feces, primarily in elderly patients who are kept on antibiotic therapy and is manifested with several clinical disorders, starting from diarrhea, and ending with pseudomembranous colitis.

## **2. Aim of the Research**

The aims of this specialist paper are to examine the representation of *Clostridioides Difficile* in samples from suspected patients, to determine the toxicity of the strains directly from the samples and from the grown cultures, to determine the genotypic affiliation of the isolates, to determine their antibiotic sensitivity, as well as the possible association of these phenotypic and genotypic characteristics in the isolates. Finally, nurses' role in control and management of these affected patients is emphasized.

## **3. Material and Methods**

In general, all fecal samples received were taken in the period 2020-2023 at the Institute of Microbiology and Parasitology, at the Faculty of Medicine in Skopje, as well as from the Microbiological Department at the Clinic for Infectious and Febrile Conditions, also in Skopje, with the aim of diagnoses CDI, where they are practically examined for immune chromatographic proof of glutamate dehydrogenase antigen (GDH) and toxins A and B of *Clostridioides Difficile*.

## **4. Results**

The highest percentage of resistance to the investigated antibiotics was observed among isolates of *Clostridioides Difficile* originating from patients hospitalized in surgical clinics. The highest percentages of resistance to the tested antibiotics were observed in the isolates belonging to the dominant rib type 001/072 and in the hyper virulent rib types 017 and 027. Namely, the number of fecal samples sent from different clinics and outpatient clinics with a request for a laboratory diagnosis of CDI does not correspond to the number of positive findings, and the greatest discrepancy was detected in surgical clinics.

## **5. Conclusions and Discussion**

In general, the laboratory diagnosis of CDI should be based on a two-part algorithm that includes the detection of GDH and *Clostridioides Difficile* toxins A and B, directly in fecal samples. Further additional testing of *Clostridioides Difficile* culture toxins also slightly reduces the false-negative rate (%). Vancomycin and metronidazole are the starting point here as the first option for CDI therapy. Therapy with clindamycin, erythromycin, imipenem, ciprofloxacin and moxifloxacin, may be considered a risk factor for CDI. There is a particularly high risk in patients receiving ciprofloxacin. The obtained results indicate the existence of a connection between ribotypes and antibiotic resistance in *Clostridioides Difficile*, and the acquisition of resistance to antibiotics is one of the main factors for the distribution and movement of ribotypes, mostly in hospital conditions, as well as the further emergence of new types. Monitoring these genotypic and phenotypic characteristics of the isolates can be of great epidemiological importance.

**Key Words:** Antibiotic treatment, Clostridioides Difficile infection, nurse, role.

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