Risk factors associated with recurrent Clostridium difficile infection in a group of inpatients in Mexico

Nancy E. Aguilar-Olivos,* Brenda Balderas-Garcés,** Cristina Gómez-Gutiérrez,** Víctor Noffal-Nuno,*** Nahum Méndez-Sánchez****

ABSTRACT

Background. Recurrence of Clostridium difficile infection (CDI) is estimated between 5-50% and depends on several factors. Objective. To assess factors associated with recurrent CDI in a Mexican population. Material and methods. We analyzed the clinical records of all inpatients in our institution with CDI from 1 January 2012 to 30 April 2015. Recurrence was considered as a second positive test after 15 days of the initial positive test. We evaluated the factors associated with recurrence. Results. One hundred and sixty-seven inpatients with CDI were studied. We found recurrence of 8.4%. Among patients with recurrent CDI, 54% were in hospital treatment with an antibiotic and had higher Charlson index. Conclusion. In the studied population, the CDI recurrence rate was 8.4%. Antibiotic use and presence of comorbidities were associated with recurrence.


INTRODUCTION

Clostridium difficile is a gram-positive anaerobic bacterium capable of producing spores and can cause potentially fatal diarrheal disease due to production toxinas.1 Clostridium difficile infection (CDI) is the leading cause of death associated with gastroenteritis. In 2007 it was estimated that killed 14,000 inhabitants in the United States, and today has become the most common cause of infections associated with health care. Approximately, 65.8% of the reported cases are associated with health care and 24.2% are developed in an inpatient setting. The crude incidence per 100,000 population ranges from 30 to 120 cases of community-acquired infections and 50 to 160 cases related to the care of health.3 In cases of infections acquired in the community, it has been reported that the rate of first recurrence is 13.5% and the mortality rate at 30 days is 1.3%. The report of patients with infection...
related to health care indicates that the first recurrence rate is approximately 21%, and the rate of 30-day mortality is 9%. It is reported that after the initial treatment, up to 20% of patients may experience a recurrence, so it is important to identify the factors associated with recurrent CDI to avoid them or get a close monitoring of patients with these factors. The aim of this study was to determine recurrence rate among inpatients and evaluate the associated factors.

MATERIAL AND METHODS

Patients

A cross-sectional study was conducted by reviewing medical records of all inpatients with a diagnosis of CDI at Medica Sur Clinic Foundation during the period from January 1st 2012 to April 30 2015. The CDI was defined by the presence of symptoms with a positive result of the immunnoassay for detecting toxins A and / or B of Clostridium difficile. Recurrence was defined as the reappearance of symptoms with a second positive test for toxin A or B after 15 days from the first test.

The variables recorded were age, sex, Charlson comorbidity index, admission to intensive care unit, length of stay, use of antibiotics and proton-pump inhibitor during hospitalization and death during the inpatient stay. Ethics committee of our institution approved the study.

Statistic analysis

The variables were grouped according to the presence or absence of recurrence. The qualitative results were summarized as absolute frequencies and proportions, while quantitative variables were expressed as means or medians with standard deviation or minimum-maximum range. Qualitative data were analyzed using χ²; meanwhile, analysis of quantitative data was done by t-test or Wilcoxon rank sum. A p value < 0.05 was considered statistically significant. The analysis was performed using STATA/SE 12.0, 2011 software.

RESULTS

One hundred and sixty-seven inpatients with diarrhea with at least one positive result for toxin A and/or B immunoassay of C. difficile were studied. The baseline characteristics of the groups showed no differences (Table 1).

Seventy percent (n = 107) were prescribed with metronidazole, 9% (n = 14) was treated with vancomycin and 21% (n = 32) received combined treatment with metronidazole and vancomycin. We did not find any significant differences between groups related to outcomes. We found a first CDI recurrence of 8.4% (n = 14) and, the second recurrence rate was 1.8%. Risk factors associated with CDI recurrence were inpatient antibiotic treatment different to metronidazole or vancomycin (p = 0.049) and the presence of a higher Charlson comorbidity index (p = 0.018). Other factors studied did not differ between groups (Table 2). The crude mortality in this study was 4.2% (7 of 167 patients).

DISCUSSION

The CDI recurrence rate was 8.4% between the inpatient Mexican group studied. Risk factors associated with CDI recurrence was administration of antibiotics others than those indicated for CDI and a high Charlson comorbidity score.

Other studies had been evaluated the risk factors associated with CDI recurrence and, highlighted the advan-
In conclusion it was found that the CDI recurrence was 8.4% and presented association with the use of additional antibiotics and the presence of comorbidities. We believe that inpatients with CDI and these conditions require close monitoring by the higher probability of recurrence.

**REFERENCES**