**Clostridium Difficile** Associated Disease: Burden of and Predictors for in Hospital Fatal Outcome. Results of a Hospital-Based Study, Bucharest, Romania

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**ABSTRACT**

In the last 15 years Clostridium difficile infection became a typical new emergent threat worldwide. Our aim was to describe the risk factors associated with fatal outcome of Clostridium difficile associated disease (CDAD) cases treated in 2012 in “Dr Victor Babes” Infectious and Tropical Diseases Hospital, a 450 beds teaching clinic from Bucharest, Romania.

**Methods:** Retrospective cohort study - the case records of hospitalized patients in the year 2012, presenting with diarrhea and that tested positive for C difficile through toxin A and B assays were reviewed. Data collected through chart review of CDAD were demographic and clinical.

A Charlson comorbidities index score was allocated to each case.

An Epilinfo data base was fed with demo and clinical data – software’s facilities were used for univariate analysis (Chi square) and also for logistic regression.

**Results:** In study were included all 326 hospitalization episodes with a discharge diagnosis of CDAD in 2012. Overall, 30 of the 326 CDAD patients (9.2%) versus 289 of the 18636 non-CDAD patients (1.55%) died during their hospital stay, resulting in a relative risk of pre-discharge death of 5.93 (4.14-8.50) for CDAD patients, a CDAD attributable risk of death of 7.65 per 100 patients and a CDAD attributable fraction of 83.15 % (70.1-86%).

Unconditional logistic regression retained as fatal outcome predictors the following: (a) a Charlson comorbidity index score >3: (OR: 3.03; CI 95%: 1.21-7.54), (b) ICU stay: (OR: 15.81; CI 95%: 4.47-55.89) and (c) age >64 years: (OR: 2.95; CI 95%: 1.15-7.69).

**Conclusions:** Our findings add to the understanding of Clostridium difficile fatal outcome and they have implications for prevention and therapy - the case fatality of 9.2% underlines the importance of the increased efforts in CDAD prevention.

**Keywords:** Clostridium difficile associated disease; predictors for fatal outcome

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INTRODUCTION

In the last 15 years Clostridium difficile infection became a typical new emergent threat worldwide – for instance number of cases of Clostridium difficile infection that were reported in 2005 in acute care hospitals in the United States (84 per 100,000) were nearly three times the 1996 rate (31 per 100,000) (1). Of even greater concern are increases in severe or fatal infection (2-4). Mortality rates from Clostridium difficile disease in the United States increased from 5.7 per million populations in 1999 to 23.7 per million in 2004 (5). In England, Clostridium difficile infection was listed as the primary cause of death for 499 patients in 1999, a number that rose to 1998 in 2005 and to 3393 in 2006 (6).

However specific data on the effect of Clostridium difficile associated disease (CDAD) on the patient’s risk of death or overall hospital mortality are scarce and predictors of outcome are inadequately understood.

AIM

To describe the burden of and risk factors associated with fatal outcome of CDAD cases treated in 2012 in “Dr Victor Babes” infectious and tropical hospital, a 450 beds teaching clinic from Bucharest, Romania.

METHODS

A retrospective cohort study was carried out. The case records of hospitalized patients in the year 2012, cases presenting with diarrhea and that tested positive for Clostridium difficile through toxin A and B assays were reviewed. Data collected through chart review of CDAD were demographic: (age, gender, place of residence) and clinical (comorbidities, lengths of hospitalization, ICU stay, recurrence status and outcome).

A Charlson comorbidities index score (7,8) was allocated to each case.

Continuous variable (length of stay and Charlson score) have been converted in categorical ones based on the cut-off represented by the value calculated for 75% percentiles of respective series. Seniors were empirically defined as patients aged over 64 years.

An EpilInfo (EpilInfo, version 3.4.2 CDC Atlanta, GA, USA) data base was fed with demographic and clinical data – software’s facilities were used for performing univariate analysis (Chi square test) and also for binary logistic regression.

The burden of CDAD associated deaths (relative risk, attributable risk and attributable fraction) was estimated by comparing with pre discharge lethality in non-CDAD cases.

RESULTS

In study were included all 326 hospitalization episodes with a discharge diagnosis of CDAD in 2012. Overall, 30 of the 326 CDAD patients (9.2%) versus 289 of the 18636 non-CDAD patients (1.55%) died during their hospital stay, resulting in a relative risk of pre-discharge risk of death of 5.93 (4.14-8.50) for CDAD patients, a CDAD attributable risk of death of 7.65 per 100 patients and a CDAD attributable fraction of 83.15 % (70.1-86%).

Univariate analysis (Table 1) identified as risk factors significantly associated (p<0.05) with the fatal outcome the following: (a) a Charlson comorbidity index score >3 [Relative Risk (RR): 2.68; 95% Confidence Interval (CI 95%): 1.35-5.31], (b) age >64 years (RR: 2.77;
The significance of this finding is special; for prevention purpose the ICU stay seems to be a key issue being the unique potentially modifiable variable from the three CDAD mortality predictors documented in this study. Logically and practically prevention of Clostridium difficile spores transmission in the health facilities and mainly in ICU appears to be the key strategy to alter the CDAD morbidity and consequently the mortality. On this end the published guidelines (19, 20) must be integrated in facility’s current practices, compliance with these practices (i.e. hand hygiene, contact precautions, antimicrobial stewardship, etc.) carefully monitored and in time feedback provided to clinicians.

**CONCLUSIONS**

Our findings add to the understanding of Clostridium difficile fatal outcome and have implications for prevention and therapy – the case fatality of 9.2% underscore the importance of increased efforts in CDAD prevention, in particular for patients with underlying diseases, old and/or treated in ICU.

**LIMITS**

Our findings are limited to hospitalized patients and may not be applicable to patients with community-associated Clostridium difficile infections (21).

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REFERENCES


