Charlson Comorbidity Index of 5 or More in Patients with *Clostridium difficile* Infection Predicts Poor Outcomes

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Introduction

Infectious Diseases Society of America (IDSA) based criteria for *Clostridium difficile* infection (CDI) severity correlates with disease outcome. Key component of IDSA criteria is based on the inflammatory response to CDI. Charlson Comorbidity Index (CCI), which measures the underlying comorbidity burden, also seem to reflect mortality in those with CDI and can be considered as a predictor of CDI outcomes.

In our study, we analyzed the CCI cut-off point to gauge outcomes across all CDI severities.

Methods

We conducted a 10-year, retrospective observational study on patients with CDI from April 2008 to November 2018. Data was retrieved from our Electronic Health Record. Based on IDSA disease severity, all patients were divided into non-severe, severe, and fulminant disease. Primary outcome was mortality due to CDI in hospitalized patients. CCI was calculated through chart review. IDSA disease severity and CCI were included as independent variables in multivariate analysis. The cut-off point for CCI was calculated based on Youden index. Estimated marginal odds were derived by using the binary logistic regression model to make predictions of outcomes.

Figure:1

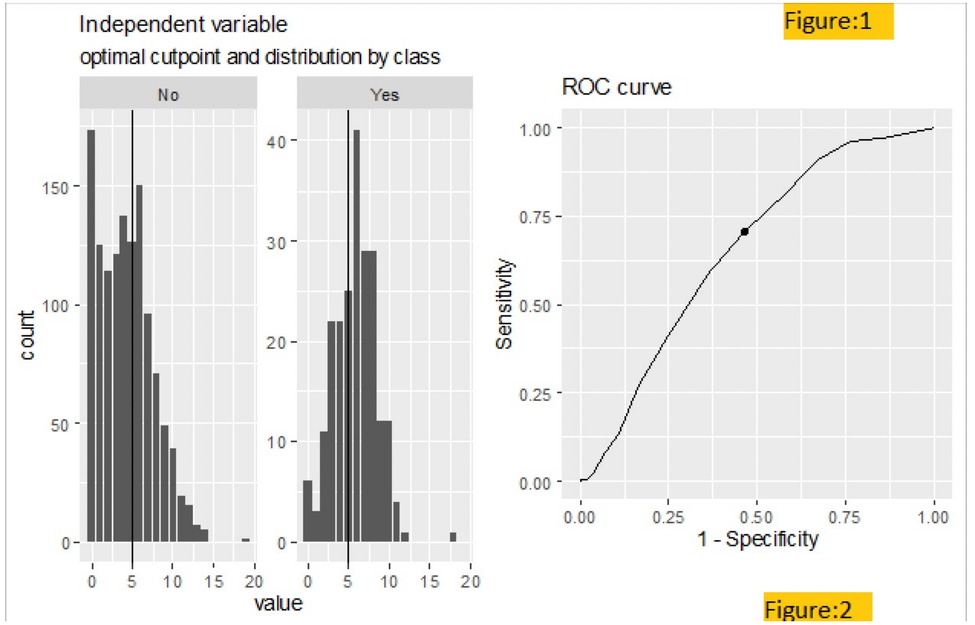
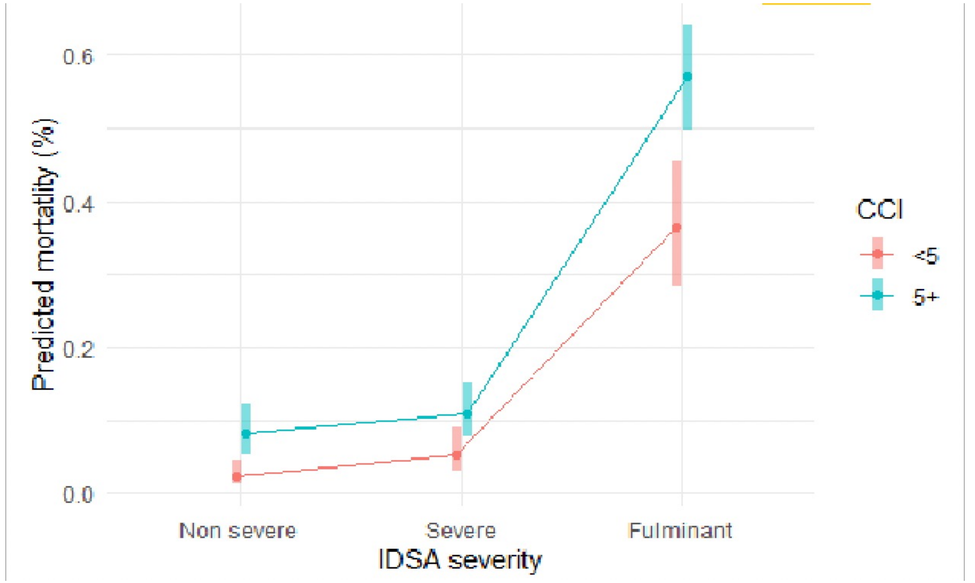


Figure:2



Results

Among the total 1470 hospitalized patients with CDI, the majority had non-severe disease (44%, 647), followed by severe (35%, 527), and fulminant disease (21%, 296). Overall mortality rate was 14.9% (219). CCI cut-off point of 5 best predicted mortality in patients with CDI, with 70% sensitivity and 53% specificity. The impact of CCI >5 on CDI-related morality could be seen across all disease severity and is especially pronounced in non-severe cases. In patients with non-severe infection, mortality rate among those with CCI > 5 was 3.67 times that of patients with CCI < 5 (OR = 3.67, p= <0.001). Among those with severe and fulminant infections, odds ratio for mortality in CCI > 5 group was 2.22 and 2.31, respectively compared to the CCI < 5 group (P < 0.05 for both comparisons).

Discussion

CDI-related sepsis can lead to exacerbation of the underlying co-morbid conditions and hence increase the mortality rate in those with CCI > 5. Currently, the CDI management is based on IDSA disease severity. However, escalation of treatment should be considered in patients with CCI > 5, regardless of disease severity.