Background: Carbapenem-resistant (CR) Gram-negative infections have received much attention because of the lack of effective treatment. This study explored the burden of CR Gram-negative pathogens on hospital stay and intensive care unit (ICU) stay.

METHODS: Hospitalized patients with laboratory-confirmed infections due to Gram-negative pathogens from specified infection sites during 2010 and 2015 were identified from Premier Healthcare Database. Two cohorts were defined using local hospital carbapenem susceptibility test results (CR cohort and carbapenem susceptible [CS] cohort). However, all patients with S. maltophilia were considered CR because of its inherent resistance to carbapenems. The length of total hospital stay and length of ICU stay were compared between two cohorts by pathogen and infection site (Blood, Respiratory, Urinary, Other).

RESULTS: From Oct 2010 to Sept 2015, 23,426 of 260,280 (9%) patients infected with non-fermenters (A. baumannii, P. aeruginosa, S. maltophilia) had carbapenem-resistant infections. About 89% of CR infections had one of three non-fermenters. The median number of days of hospitalization by pathogen and infection site is shown in the table below. Length of total hospital stay was longer in CR cohort than CS cohort in each instance, except for A. baumannii in Respiratory.

INTRODUCTION

Carbapenem-resistant (CR) Gram-negative infections have received much attention because of the lack of effective treatment options1,2. This study explored the burden of CR Gram-negative infections from non-fermenters (A. baumannii, P. aeruginosa, S. maltophilia, Enterobacteriaceae) and Respiratory, Urinary, Other pathogens. The Premier Research Database collects anonymized data from participating hospitals.

METHODS

Data Source

The Premier Research Database collects anonymized patient-level data from over 700 US hospitals annually.

A subset of these hospitals provided microbiology test results such as species, site, pathogen, and drug sensitivity.

This study used the microbiology data from 180 hospitals.

Study Design

This study identified patients with positive cultures for A. baumannii, P. aeruginosa, S. maltophilia, K. pneumoniae and/or E. coli from the microbiology results provided in the Premier Database.

The following process was used to identify eligible observations:

1. Any specimen with a positive result for one of above pathogens was selected.

2. The specimen body site was categorized as Blood, Respiratory, Urinary, or Other.

3. A. baumannii and P. aeruginosa were defined as resistant or intermediate to meropenem or imipenem.

4. K. pneumoniae and E. coli were defined as resistant or intermediate to meropenem, imipenem, or ertapenem.

5. S. maltophilia were considered CR because of its inherent resistance to carbapenems.

Statistical Analysis

Descriptive statistics were used to present number (n) and percent (%) for categorical variables, median for continuous variables.

RESULTS

Table 1. Pathogen by Body Site and Carbapenem Resistance, n (%) Table 2. Patients with an ICU Stay, n (%)