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ABSTRACT

Beyond the Pandemic Unveiling Carbapenem Resistance in MDR Klebsiella – A Tertiary Care Insight

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Introduction

Increases in cases linked to klebsiella that are resistant to carbapenem have been documented (1, 2). The main concerns with these organisms are that they are challenging to treat. The patients frequently experience higher rates of morbidity and mortality, and the infection can spread.

Objectives

To study the pattern and incidence of carbapenam resistant klebsiella in an intensive care unit and determine the risk factors for mortality.

Materials and methods

Patients who tested positive for carbapenam-resistant Klebsiella and were admitted to Bangalore Baptist Hospital's intensive care unit between June 2022 and November 2023 were the subjects of a retrospective observational study. The study involved 43 patients. All patients who had culture positivity for multidrug resistant klebsiella had carbapenamase resistance testing done. Data was recorded in an Excel spreadsheet, and analysis was done using SPSS software.

Results

The study comprised 43 patients who were admitted to the intensive care unit and whose carbapenam-resistant Klebsiella (CRK) test result was positive. There were 28 patients who were male and 15 who were female. The average age was fifty-nine. Diabetics made up the majority of the patients (28/43; 65.1%). Sputum cultures had the highest positive rate (16/43; 37.2%). Incidence of CRK during this time was 7 cases per 1000 people-year (1.1%). Twenty patients tested positive for OXA-48 and NDM. Fifteen patients had NDM positivity, while eight patients had OXA-48 positivity. The NDM group and the

NDM plus OXA-48 group had the same mortality rate, while the OXA-48 positive group had a slightly higher death rate (4%, 4%, and 6%, respectively). 36 patients were discharged and 7 patients died. A favorable association between mortality and increasing age, serum procalcitonin levels, total whole blood cell count, and more comorbidities was demonstrated by univariate logistic regression.

Discussions

The incidence of CRK was 7 cases per 1000 patient years(1.1%). This is lesser than has been reported previously in other regions (3, 4). Male predominance and sputum cultures showing highest positivity(37.2%) were findings similar to other studies. Many patients had more than one comorbidity (27/43; 62.8%). Diabetes mellitus was the most common comorbidity (28/43). In our study maximum CRK isolates had positivity for both NDM and OXA-48 (20/43;46.5%) and the remaining were either NDM (15/43;34.8%) or OXA-48 positive(8/43;18.6%). In India, carbapenem resistance is predominantly due to NDM and OXA-48-like species (5). Our study showed similar findings. Mortality rates for the NDM positive group, both NDM and OXA-48 group and OXA-48 positive group were 4%, 4% and 6% respectively. Overall mortality was 16.2%. This was lower in comparison to previous studies from China(6) and India(7). Univariate logistic regression showed positive correlation of increasing age, serum procalcitonin values, total WBC count and more number of comorbidities with mortality.

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