

Antibiotic Treatment Patterns And Outcomes Among Patients Hospitalised in ICU With Community-Acquired Bacterial Pneumonia: A US Cohort Study

ECCMID 2014 – eP066

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Objectives: To evaluate the rate of rehospitalisations, adverse events, and mortality observed in Community Acquired Bacterial Pneumonia (CABP) patients hospitalised in the intensive care unit (ICU) by type of antibiotic administered.

Methods: This was a retrospective cohort study using a database derived from the billing systems of approximately 600 US based hospitals. Adult patients hospitalised in the ICU for CABP between January 1, 2007 and December 31, 2012 receiving antibiotic therapy within 48 hours of hospital admission were included. Patients admitted to the ICU were identified within the first 24 hours of admission. The study outcomes were: patterns of initial antibiotic therapy, rates of treatment related adverse events, rate of mortality during hospital stay, and rate of rehospitalisation due to CABP within 30 days of initial hospitalization. Adverse events evaluated included *Clostridium difficile*, enterocolitis, peripheral neuropathy and events related to the central nervous system, skin, gastrointestinal system, hepatotoxicity, hematologic toxicity and QTc interval prolongation. Rates of adverse events, mortality and rehospitalisation were compared between treatment groups for ICU patients using multivariate models that controlled for age, gender, comorbidities, and length of hospital stay.

Results: A total of 38,449 ICU patients were evaluated.

The 2 most commonly used antibiotics in the ICU setting were fluoroquinolone + beta lactam (F/BL) and macrolide + beta lactam (M/BL); the most common regimens were levofloxacin + ceftriaxone sodium and azithromycin + ceftriaxone sodium, respectively. Patients receiving fluoroquinolone regimens were slightly older and had more comorbidities relative to the M/BL patients. Multivariate regression models comparing rates of any treatment related adverse event in the ICU setting showed an 8% increased risk among the F/BL patients relative to M/BL patients (OR=1.08, 95% CI: 1.00-1.16). There was a 67% increased risk of mortality in the F/BL group compared to the M/BL group (ICU: OR=1.67, 95% CI: 1.26-2.21). Patients administered F/BL in the ICU setting had a 38% increased risk of rehospitalisation due to CABP compared to the M/BL patients (OR=1.38, 95% CI: 1.15-1.65).

Conclusion: This study provides detailed, comprehensive data for examining hospital care, including drug utilization in the inpatient CABP setting. The commonly used treatment regimens for CABP patients treated in the ICU settings are consistent with the guidelines recommended by the European Respiratory Society for severe CABP patients and appear to be associated with differences in outcomes that persist even when patient differences are accounted for. One limitation of these results is the difficulty in properly accounting for disease severity, which is difficult to derive from a database derived from billings systems.