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Title: Outcome of failed empirical antibiotic therapy on the mortality of elderly patients with hospitalized pneumonia: A propensity score-based analysis

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Body: One of the major problems in analyzing covariates on prognosis of pneumonia is confounding by indication for a choice of antibiotic treatment. We assessed the outcome of unsuccessful empirical antibiotic therapy on the mortality of elderly patients (≥ 75 years old) with pneumonia, including community-acquired pneumonia (CAP) and nursing home-associated pneumonia (NHAP). We analyzed data collected prospectively in 4 medical hospitals at Sanin area in Japan from 2005 to 2011. Empirical therapy was considered as failure if initial treatment did not decrease white blood cells and/or fever within 3 days. The main outcome variables were in-hospital mortality. Adjusted analyses were performed by Cox proportional hazards regression with propensity score weighting. Of the 303 patients (205 CAP and 98 NHAP), 65 (21%) died due to pneumonia during hospitalization. After adjustment for propensity score of treatment weighting, it demonstrated that failure of initial treatment, congestive heart failure, the severity of CURB-65 score, and disuse of β -lactam/ β -lactam inhibitor (BLBLI) combinations were independently associated with prognosis of pneumonia, with hazard ratios of 9.28 (95% confidence interval [CI], 5.07 to 17.0), 3.09 (95% CI, 1.44 to 6.63), 1.93 (95% CI, 1.03 to 3.60), and 1.80 (95% CI, 1.01 to 3.19), respectively. By using the propensity score analysis, this study confirmed that choice of antibiotics was an important factor for prognosis of elderly patients with pneumonia.