infection, the duration of pre-hospitalization 214 days (P = 0.034), the absolute neutrophil count < 100 (P = 0.048) and steroid use (P = 0.025) were statistically significant risk factors. The mean length of hospital stay was 107 (±103) days. Klebsiella spp. attributable mortality due to infection was 14% and crude mortality was 15%. No statistically significant difference was found in patients who developed resistant and susceptible infections.

Conclusion. Carbapenem resistance in Klebsiella infections was increased. Prolonged hospital stay, neutropenia and steroid use in the last 3 months were identified as significant risk factors for carbapenem-resistant Klebsiella infections.

Table 1: Evaluation of risk factors for carbapenem-resistant and carbapenem sensitive cases in Klebsiella spp. Urinary infections

| Parameter | Carbapenem Resistant Klebsiella | Carbapenem Sensitive Klebsiella | P value |
|-----------|---------------------------------|---------------------------------|---------|
| Age (year) | Median (IQR) | 36.7 (29.4–43.6) | 31.8 (24.7–38.4) | 0.044 |
| Length of stay in hospital before infection (median/IQR) | 20 (7.6) | 14 (5.5) | 0.331 |
| Length of stay in hospital before infection ≤ 14 days (median/IQR) | 20 (7.6) | 14 (5.5) | 0.044 (OR 3.01/95 CI 1.65–5.67) |
| Length of stay in hospital after infection (median/IQR) | 55 (57) | 24 (49.5) | 0.331 |
| Length of stay in hospital after infection ≤ 14 days (median/IQR) | 21 (80.8) | 37 (62.7) | 0.059 |

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2274. Comparison of Clinical Outcomes in Patients with Extensively Drug-Resistant Pseudomonas aeruginosa Pneumonia Treated with Aminoglycosides vs. Ceftolozane/Tazobactam

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Background. Extensively drug-resistant (XDR) P. aeruginosa (PA), defined as resistant to ≥2 agents in all classes of antibiotics except two classes, limits therapeutic options to more toxic agents such as aminoglycosides (AMG) and polymyxins. Majority of the XDR PA isolated in two of our teaching hospitals were found to be susceptible to ceftolozane-tazobactam (CT) in addition to AMG and polymyxins. Our study aims to compare treatment outcomes with traditional antibiotics vs. CT in patients with XDR PA pneumonia.

Methods. This was a retrospective case–control study of patients admitted to two local hospitals from 2013 to 2018. Patients were screened by discharge diagnosis for XDR PA pneumonia. We included patients over 18 years with XDR PA in sputum cultures susceptible to ≤ 2 classes of antibiotics. Statistical analyses included ANOVA, T-test, Fisher exact and Chi-square tests.

Results. Among the 48 patients with XDR PA pneumonia, 33 patients met inclusion criteria. Their mean age was 62 years (SD ±16), 30% were female, and 18% were immunocompromised. Similarly, 85% of patients had underlying lung disease and 55% had a tracheostomy tube. Majority of these patients were either nursing home residents (55%) or hospitalized (46%) within past 3 months. Septic shock associated with XDR PA pneumonia was found in 30% of patients, and 73% required mechanical ventilation during treatment. Nineteen patients received an aminoglycoside (AMG group), 1 colistin, 9 CT (CT group), and 4 received CT plus an AMG. The average time to clinical improvement was 3.5 (±2.2) days for AMG group and 2.2 (±1.7) days for CT group (P = 0.3). Compared with CT group, AMG group had significantly longer mean duration of hospital stay (19 ± 13 vs. 32.4 ± 17 days, P < 0.05). All patients who had clinical failure to improve requiring change in antibiotics (2 patients) or who died after withdrawal of care (3 patients) were in AMG group. Clinical relapse within 30 days occurred equally in both groups (AMG: 2, CT: P > 0.05). Six patients who developed acute kidney injury received either an AMG (5) or colistin (1).

Conclusion. Based on our observation, CT is a safe and effective treatment for XDR PA pneumonia. Compared with CT, patients who received AMG had longer hospital stays and sustained more nephrotoxicity.

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