

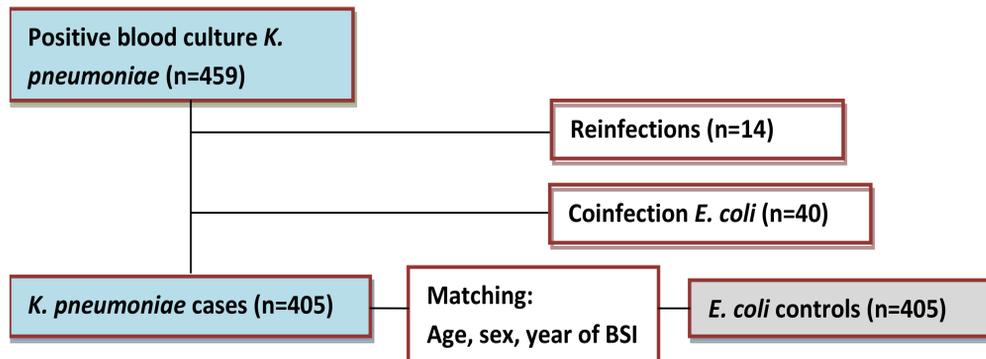
Risk factors, prognostic factors and outcome in patients with bloodstream infection caused by *Klebsiella pneumoniae* versus *Escherichia coli*

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Conclusions: Thirty-day mortality was similar in patients with BSI caused by *K. pneumoniae* and those with *E. coli* BSI. The study indicates that *K. pneumoniae* is a more common hospital-acquired pathogen affecting patients with multiple comorbidities. The prevalence of antibiotic resistance was higher among *E. coli* than *K. pneumoniae*. The empirical antibiotic treatment used in Sweden still seems effective and carbapenems can be avoided in most cases.

Objectives

To compare patients with bloodstream infection (BSI) caused by *K. pneumoniae* with invasive infection caused by *E. coli* regarding risk factors for acquiring infection and prognosis.



Methods

Retrospective case-control study based on medical charts from all patients ≥ 18 years admitted to Karolinska University Hospital, Stockholm, between 2006 and 2010 with BSI caused by *K. pneumoniae* (n=445). 40 patients were excluded due to co-infection with *E. coli*, leaving 405 cases. Each case was matched (age, sex and year of disease) with a control with BSI caused by *E. coli* (n=405). Data was collected regarding risk factors, antimicrobial resistance and mortality. To measure comorbidity, Charlson comorbidity index was used, and an index >5 was considered "high comorbidity". Univariate analysis was performed, using Chi2-test. Multivariate analysis concerning mortality and predictors for contracting BSI caused by each agent is ongoing.

| | <i>K. pneumoniae</i> (n=405) | <i>E. coli</i> (n=405) | P-value |
|--|---------------------------------|---------------------------|---------------|
| Age, median, years | 67 | 67 | |
| Male sex | 230 (56.8 %) | 230 (56.8 %) | |
| Dead within 30 d | 59 | 47 | 0.21 |
| Charlson score >5 | 140 | 104 | 0.0058 |
| Diabetes | 79 | 68 | 0.32 |
| Heart disease | 97 | 101 | 0.74 |
| Lung disease | 68 | 55 | 0.20 |
| Kidney disease | 71 | 47 | 0.017 |
| Liver disease | 71 | 53 | 0.079 |
| Malignancy, all | 212 | 158 | 0.0001 |
| Hematological | 83 | 57 | 0.016 |
| Metastasized | 51 | 26 | 0.0027 |
| Hospital-acquired infection | 209 | 152 | 0.0001 |
| Urinary catheter | 136 | 79 | 0.0001 |
| Central catheter | 131 | 65 | 0.0001 |
| Source of infection | | | |
| Urinary tract | 169 | 265 | 0.0001 |
| Bile/liver | 52 | 30 | 0.010 |
| Antimicrobial resistance | | | |
| ESBL | 7 | 14 | 0.12 |
| Resistant to ≥ 3 antibiotic classes | 10 | 29 | 0.0018 |

Results

The 30-day mortality was 14.6% among the cases and 11.6 % among the controls (p=0.21). Patients with BSI caused by *K. pneumoniae* had more comorbidities than patients with BSI caused by *E. coli*, 140 and 104 patients respectively, had a Charlson index >5 (p=0.006). There was a higher prevalence of malignancies, 212 versus 158 (p=0.0016) and metastasized malignancies, 51 versus 26 (p=0.0027) among the cases. The most common malignancy was hematologic.

Among the cases 51.6 % (209) of the episodes were hospital-acquired compared to 37.5 % (152) among the controls (p=0.0001). The cases also significantly more often had central and urinary catheters/history of reconstructive urinary tract surgery than the controls (p=0.0001). The most common found source of infection was the urinary tract in both groups, but this source was significantly higher in the control group (p=0.0001).

The incidence of ESBL-producing BSI was low; 1.7 % (7) among the cases and 3.4 % (14) among the controls. The *E. coli* isolates were significantly more (p=0.0018) often resistant to ≥ 3 antibiotic classes than the *K. pneumoniae* isolates.

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