

Postoperative pneumonia after cardiac surgery: do we need to rethink our antimicrobial strategy?

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Introduction

Appropriate early antibiotic therapy for presumed pneumonia in critically ill patients in the intensive care unit (ICU) decreases mortality. Pathogens and antibiotic resistance patterns vary significantly among institutions and can vary within institutions over short periods of time (eg, month to month). Local antibiograms at institutional level that are updated on a regular basis are essential in determining appropriate empirical antibiotic therapy.

Objectives

The purpose of this study is to assess our current empirical antimicrobial therapy for presumed community-acquired pneumonia (CAP) after elective cardiac surgery.

Methods

This retrospective review of medical records was conducted in a tertiary mixed-ICU teaching hospital between January 2013 and January 2020 on patients receiving empirical Cefepime for a presumed CAP (compatible clinical syndrome, infiltrate on chest imaging) after different types of elective cardiac surgery. Exclusion criteria for analysis were hospital admission >1 day prior to surgery, initiation of Cefepime therapy ≥ 5 days after ICU admission, recent antimicrobial therapy (within 6 weeks of admission) or directed therapy before Cefepime initiation, immunocompromised patients, heart transplantation, and patients on mechanical support (ECMO, assist devices). All patients received a preoperative prophylactic dose of Cefazolin, according to routine clinical practice. Cefepime was administered as a continuous infusion, with a loading dose and adjusted for renal function. Age, sex, history of chronic obstructive pulmonary disease (COPD), smoking status and de-escalation therapy (defined as discontinuation of Cefepime infusion within 4 days of initiation) were collected from medical files. Respiratory cultures were collected before initiation of Cefepime infusion. Data were numbers (percentages) and/or mean \pm SD where appropriate.

Results

Data of 91 patients were retrieved: 70 (76.9%) were male and 21 (23.1%) female. Age was 73 (± 11) years. In 43 patients (47.2%) no pathogen was detected despite extensive microbiologic evaluation. No respiratory culture was available in 25 (27.4%) patients due to the lack of sputum sampling. Directed de-escalation of antibiotic to amoxicillin-clavulanic acid was seen in 7 (7.6%) patients. In 5 (5.5%) patients de-escalation was possible but not fulfilled. Antimicrobial resistance to amoxicillin-clavulanic acid was seen in 11 (12%) patients. Three of them were diagnosed with COPD/active smoking. The identified resistant pathogens included enteric gram-negative bacteria,

mainly *Enterobacter* species, *Klebsiella pneumoniae*, *Escherichia coli*, *Serratia marcescens*, *Proteus* and *Acinetobacter* species.

Conclusion

Our current common practice to start Cefepime after elective cardiac surgery results in overuse of this antibiotic in patients with a presumed CAP. Only in patients with a history of respiratory disease (mainly COPD) empirical start of broad spectrum cephalosporins might be considered.