Hospital Pharmacy and Department of Infectious Diseases and Hospital Epidemiology

Efficacy of continuous dosing regimens of β-lactam antibiotics

- A Systematic Review and Meta-Analysis

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Background

Continuous infusion of β-lactams has been proposed as a method to enhance (PK/PD) parameters and improve clinical outcomespharmacokinetic/pharmacodynamic.

We aimed to **assess the efficacy of continuous dosing regimens of β-lactam antibiotics compared to intermittent administration in adult populations.**

Method

systematic review with meta-analysis [1]

- **P** adults
- **I** continuous infusion (CI; 24 h/day) of β-lactams
- **C** intermittent administration (IA; ≤1 h/dose)
- **O** mortality, clinical or microbiological cure, pharmacokinetic (PK)/pharmacodynamic (PD) targets as well as safety profiles
- studies published until 22nd of August 2022

Results

Inclusion of **26 studies, of which 8 studies investigated critically ill patients**

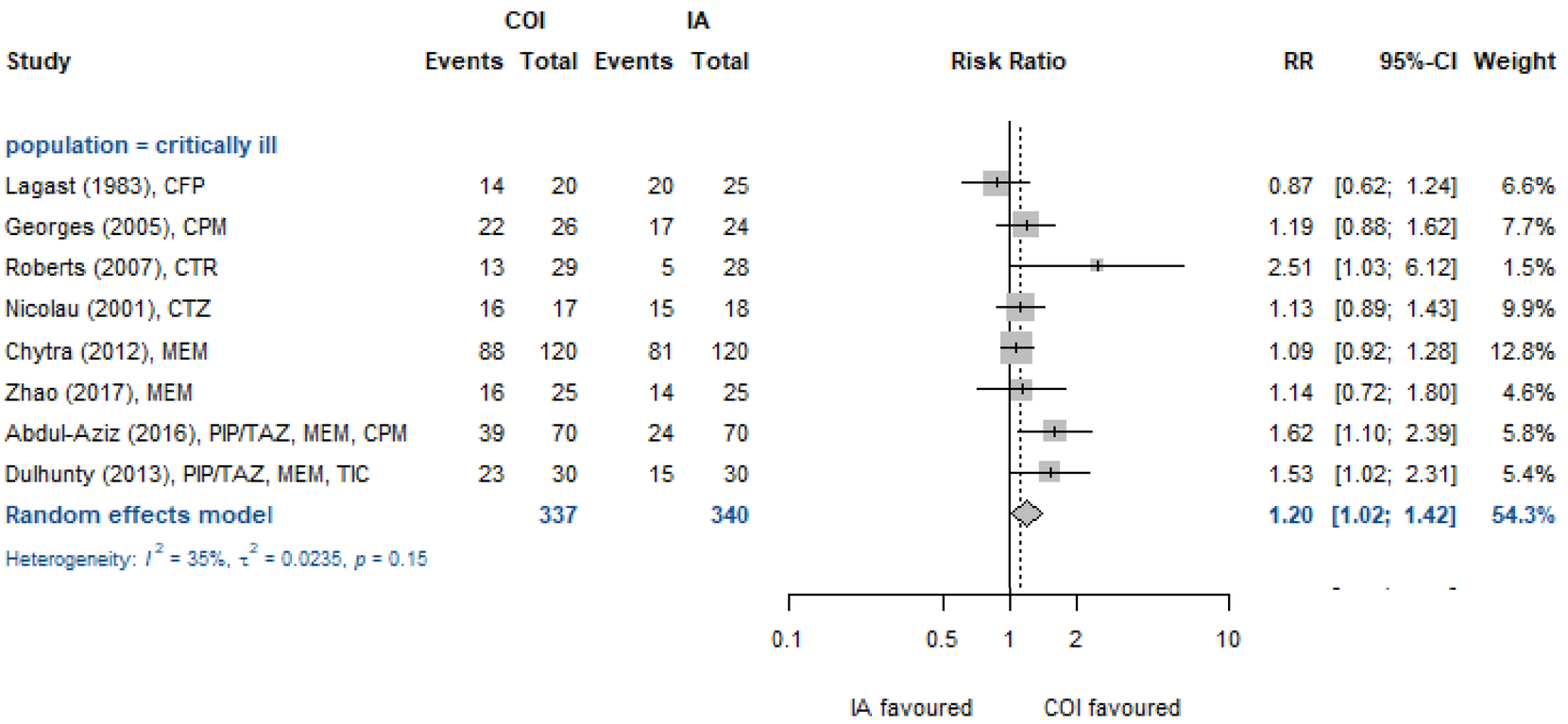

Figure 1. Forest plot examining clinical cure outcomes associated with β-lactam antibiotics administered via continuous or intermittent infusion stratified according to the study population, which was critically ill.

efficacy

- ✓ **better PK/PD target attainment** with continuous infusion
- ✓ statistically significant **improved clinical cure rate** among patients receiving continuous infusion therapy in the subgroup of critically ill patients (RR 1.20, 95% CI 1.02-1.42, p=0.0251)

safety

- ✓ no safety issues reported

Conclusion and outlook

Our findings suggest that continuous dosing regimens of β-lactam antibiotics offer superior clinical efficacy, particularly in critically ill patients, while maintaining a favorable safety profile. Continuous infusion of β-lactam antibiotics is **advantageous for optimizing antimicrobial therapy for patients** and might probably be a **strategy to mitigate emergence of resistance**

These results advocate for the broader adoption of continuous infusion strategies in antimicrobial therapy protocols, with potential implications for optimizing treatment outcomes.

[1] PROSPERO (CRD42022346110)

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