

Emergence of Antibiotic Resistance of Bacteremia--Shorter versus Longer Treatment: A Systematic Review of Randomized Controlled Trials and Cohort Studies

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Abstract

Background Antimicrobial resistance (AMR) is one of the significant public health problems recognized throughout the world. Since 2000, multidrug-resistant gram-negative bacilli have become a problem. Antibiotic consumption is also related to the emergence of AMR. This study was aimed to evaluate any reduction in AMR by short-course compared to long-course antibiotic therapy for bacteremia. **Methods** Systematic review was conducted using PubMed, EMBASE, CENTRAL, and medRxiv between January 2000 and May 2020. RCTs and cohort studies were included without applying language restrictions. The risk of bias was evaluated, and certainty of evidence was estimated using Grading of Recommendations Assessment, Development, and Evaluation (GRADE). The statistical evaluation of heterogeneity was performed using the χ^2 and I^2 tests. **Results** Two RCTs (938 participants) and three cohort studies (1938 participants) were eligible based on the inclusion criteria. The level of evidence of RCTs and cohort studies was evaluated to be low and very low, respectively, using GRADE. Pooled analysis of two RCTs and cohort studies reported RR of 1.21, 95% CI [0.76, 1.91], $p = 0.43$, $I^2 = 31\%$ and OR of 0.51, 95%CI [0.32, 0.82], $p = 0.006$, $I^2 = 20\%$, respectively. **Conclusion** We found limitations to incorporate collecting and analyzing of data that were not significantly different. RCT should be performed with an AMR-focused design such as active surveillance of AMR of bacteremia including comparison between short and prolonged courses of antibiotic treatment.

Keywords: antibiotic resistance, gram-negative, bacteremia, One Health