

Impact of Early Antibiotic De-Escalation on Mortality in Febrile Neutropenia in Patients with Hematologic Malignancy Receiving Treatment: A Meta-Analysis

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Background

IDSA recommends antibiotics until the absolute neutrophil count (ANC) exceeds 500 cells/ μ L, **regardless of clinical course or identification of an infectious source**.

ASCO and ESMO advise completing the antibiotic course based on the infectious source **or** until the ANC exceeds 500 cells/ μ L.

NCCN guidelines suggest the duration depends on the infection source, clinical course, neutropenia recovery, toxicity, and infectious disease consultant opinions.

ECIL recommends stopping empiric antibiotics after 72 hours in hemodynamically stable, afebrile patients for at least 48 hours, **regardless of ANC**.

Inclusion and Exclusion Criteria

The inclusion criteria

Studies involving **patients with hematologic malignancies post-treatment** (e.g., chemotherapy, bone marrow transplant) with **neutropenia** (WBC < 3000 or ANC < 1500) and a **febrile condition** (101°F or 38.3°C).

The interventions studied included antimicrobial stewardship practices focusing on **de-escalating or discontinuing** antibiotics. The primary outcome is mortality.

Study designs included retrospective and prospective observational studies and randomized controlled trials (RCTs) until January 2024.

Exclusion criteria

Studies not specifically addressing febrile neutropenia (FN) in the context of malignancies, involving chronic or congenital neutropenia, or not focusing on antibiotic stewardship or de-escalation strategies.

Methods

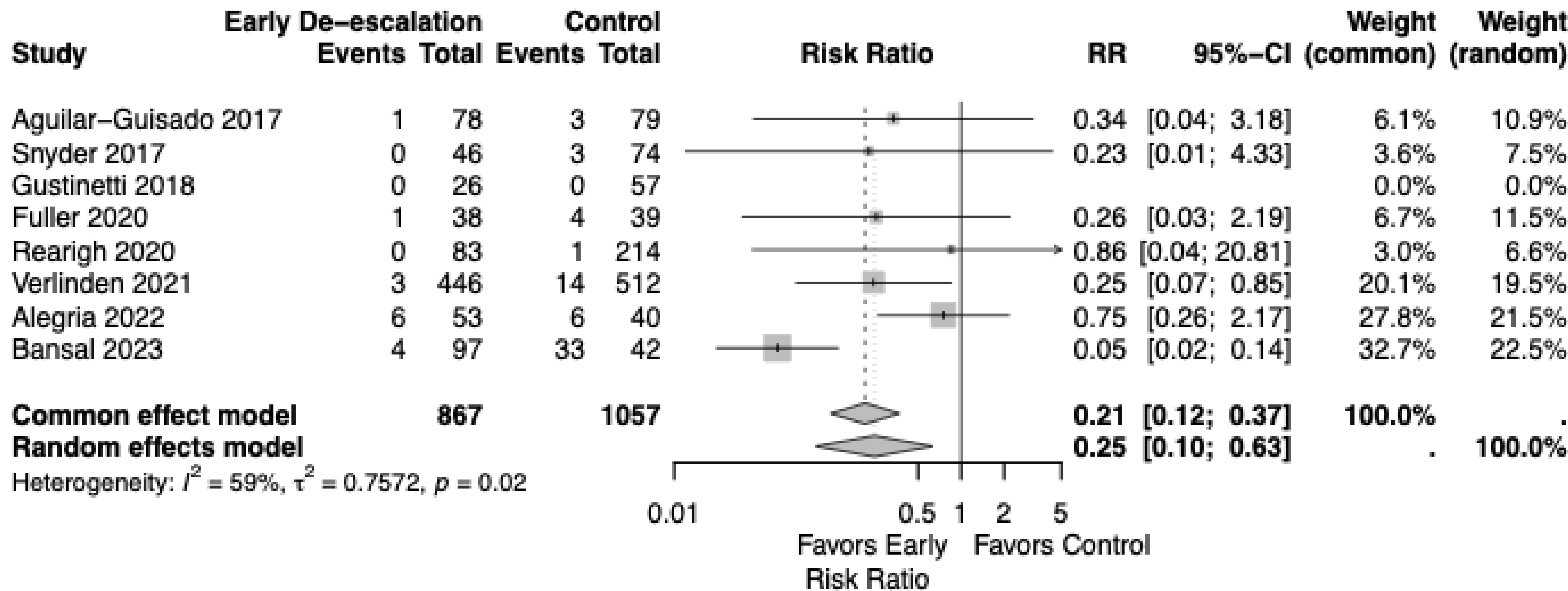
A thorough review of existing literature was conducted to locate all historic studies published up to January 2024. Primary sources included the PubMed, EMBASE, Cochrane Library, and Clinical Trials databases.

Statistical analysis included pooled risk ratios (RR) and trial sequential analysis (TSA) for mortality.

To compare the clinical efficacy and safety of antibiotic de-escalation in patients with hematologic malignancies who underwent treatment and developed FN before hematopoietic recovery versus those who continued broad-spectrum antibiotics until clinical signs of hematopoietic recovery.

Result

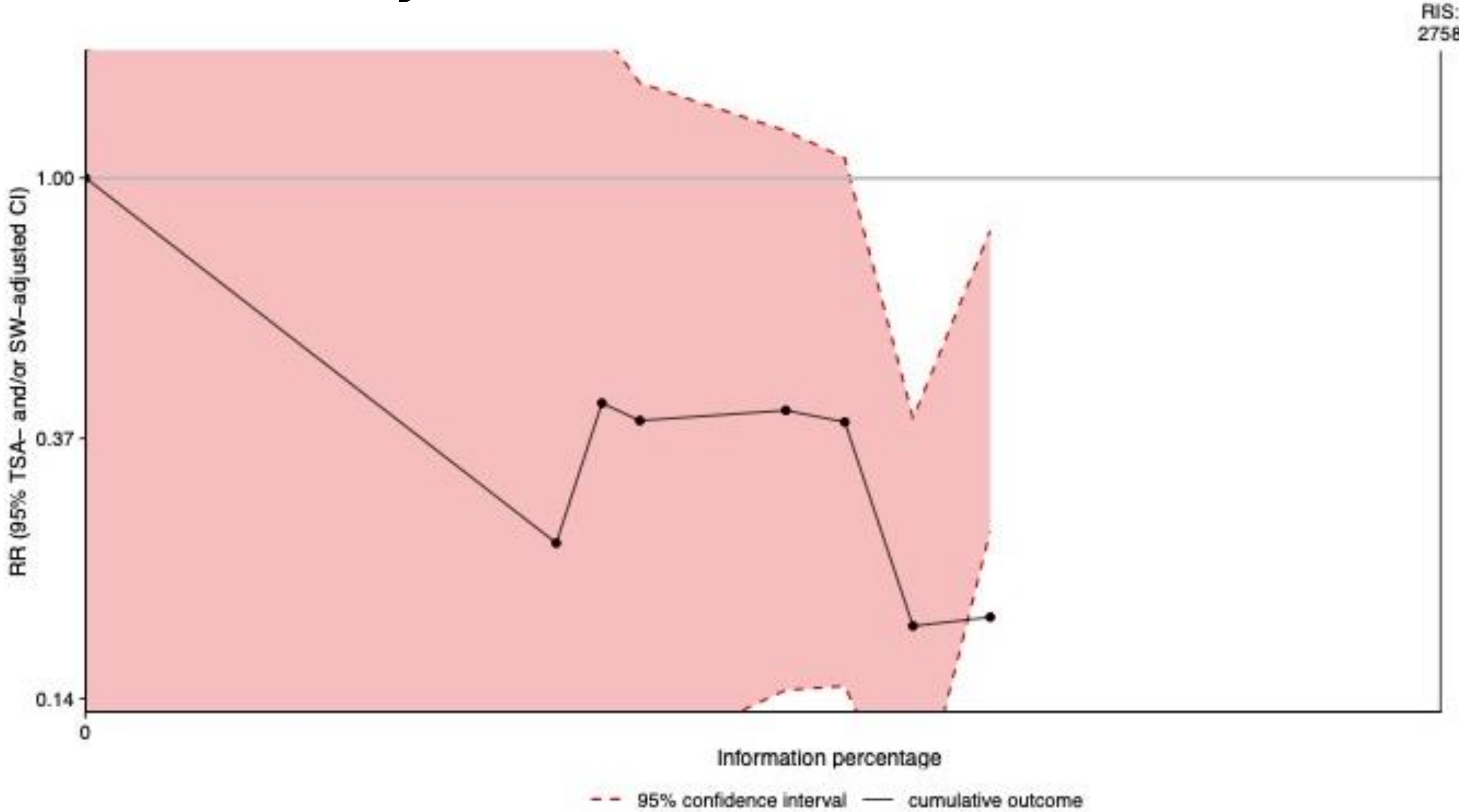
Forest Plot of Mortality



Full article and references: Chen Y, Sun AY, Narain K, Chang W, Yang C, Chen P, Jhou H, Dai M, Rastogi N, Lee C. 2025. Efficacy and safety of early antibiotic de-escalation in febrile neutropenia for patients with hematologic malignancy: a systematic review and meta-analysis. Antimicrob Agents Chemother

Result and Conclusion

TSA of Mortality



Our study, with a **larger sample size**, suggested that early de-escalation of broad-spectrum antibiotics in hematologic cancer patients with FN significantly reduces mortality compared to prolonged broad-spectrum antibiotics use.

These findings advocate revisiting current guidelines to incorporate de-escalation strategies, enhancing antibiotic stewardship, and improving patient outcomes.