INPLASY

Comparative Effectiveness and Safety of Monotherapy and Defined Combination Regimens for Stenotrophomonas maltophilia Infections: A Network Meta-Analysis

INPLASY2025120093
doi: 10.37766/inplasy2025.12.0093
Received: 29 December 2025
Published: 29 December 2025

Ai, MY; Chang, WL.

Corresponding author:
Ming-Ying Ai

m120103008@tmu.edu.tw

Author Affiliation:
Far Eastern Memorial Hospital, New Taipei City.

ADMINISTRATIVE INFORMATION

Support - N/A.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025120093

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 December 2025 and was last updated on 29 December 2025.

INTRODUCTION

Review question / Objective Among human patients with Stenotrophomonas maltophilia infections, what are the comparative effectiveness and safety of monotherapy versus pre-defined combination regimens across available antimicrobial options, using network meta-analysis (NMA) to rank treatments?

Rationale S. maltophilia is intrinsically resistant to multiple antimicrobial classes and is increasingly associated with severe infections (e.g., bacteremia, pneumonia) in hospitalized and immunocompromised populations. While TMP-SMX has been a historical standard, alternative agents (e.g., fluoroquinolones, minocycline) and combination approaches are frequently used due to intolerance, resistance, severity of illness, or clinician preference. Direct head-to-head comparative evidence across regimens remains limited and fragmented. An NMA can integrate direct and indirect evidence to estimate relative effects and provide a treatment ranking for both efficacy and toxicity.

Condition being studied Clinically significant Stenotrophomonas maltophilia infection (e.g., bacteremia, pneumonia, complicated respiratory infection, other invasive infections) in humans, confirmed by microbiological culture or equivalent diagnostic criteria as defined in each study.

METHODS

Search strategy Systematic search of electronic databases from inception to the most recent search date, using controlled vocabulary (e.g., MeSH/Emtree) and keywords related to: “Stenotrophomonas maltophilia” and “mortality”.

Participant or population Human participants.

Intervention Monotherapy or defined combination regimens of systemic antimicrobials used to treat S. maltophilia infections.

Comparator Any eligible alternative monotherapy or defined combination regimen, including usual care comparators reported in included studies.

Study designs to be included Retrospective study.

Eligibility criteria Inclusion: (1)Human studies with confirmed S. maltophilia infection. (2) Comparative analysis of at least two eligible regimens (mono or defined combination). (3) Reports at least one predefined outcome (e.g., mortality, clinical success, adverse events). (4) Sufficient data to compute effect estimates (OR/RR/HR) or extract raw event counts. Exclusion: (1) Case reports/ series without a comparator arm. (2) Studies focused only on colonization without clinical infection. (3) In vitro only or animal only studies. (4) Studies where treatment arms/regimens are not clearly defined or cannot be mapped into nodes for NMA.

Information sources PubMed/MEDLINE、Embase、Cochrane CENTRAL (optional but recommended even if retrospective-only, to ensure coverage).

Main outcome(s) All-cause mortality (preferably 30-day; otherwise in-hospital/ICU mortality as defined by each study).

Additional outcome(s) Clinical success / clinical cure、Microbiological eradication、Recurrence/ relapse、Adverse events.

Data management Data extraction was conducted independently by two authors (M.-Y.A. and W.-L.C.). Extracted variables included patient demographics, study characteristics, details of antimicrobial treatment regimens, and data on predefined primary and secondary outcomes. Discrepancies were resolved through discussion and consensus.

Quality assessment / Risk of bias analysis The studies included in our meta-analysis consisted of both prospective and retrospective cohort studies. The quality assessment was conducted using the widely used Newcastle-Ottawa Quality Assessment scale (NOS), which assesses the quality and bias of cohort and case-control studies.

Strategy of data synthesis The data were synthesized using a network meta-analysis (NMA) framework to enable simultaneous comparison of all eligible antimicrobial regimens. A random-effects model was applied to account for anticipated clinical and methodological heterogeneity across studies. Pooled relative treatment effects were estimated and reported as odds ratios (ORs), risk ratios (RRs), or hazard ratios (HRs) with corresponding 95% confidence intervals (CIs), depending on data availability and outcome definitions. Statistical significance was defined as a two-sided p-value < 0.05. Treatment ranking probabilities were summarized using surface under the cumulative ranking curve (SUCRA) values or P-scores, with rankograms presented where applicable. Between-study heterogeneity was quantified using the between-study variance (τ^2), and inconsistency within the evidence network was evaluated using both global approaches (design-by-treatment interaction models) and local methods (node-splitting or loop-specific inconsistency analyses). Potential small-study effects and publication bias were assessed using comparison adjusted funnel plots when sufficient studies were available.

Subgroup analysis No subgroup analyses were performed.

Sensitivity analysis To assess the robustness of the meta-analysis, sensitivity analyses were conducted using a leave-one-out approach, in which each study was sequentially excluded to evaluate whether removal of any single study resulted in a meaningful change in the pooled effect estimates.

Language restriction No language limit.

Country(ies) involved Taiwan.

Keywords Stenotrophomonas maltophilia; Mortality; Fluoroquinolone; Minocycline; Combination therapy.

Contributions of each author

Author 1 - Ming-Ying Ai.
Email: m120103008@tmu.edu.tw
Author 2 - Wei-Lun Chang.
Email: littlewind@pharmacist.tw