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Efficacy and safety of linezolid versus vancomycin for the treatment of central nervous system infections: a meta-analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 September 2025 and was last updated on 28 September 2025.

INTRODUCTION

Review question / Objective To explore the efficacy and safety of linezolid compared to vancomycin in central nervous system infections related to Gram-positive bacteria through meta-analysis.

Condition being studied Central nervous system infections related to Gram-positive bacteria.

METHODS

Search strategy We searched the databases, such as PubMed, Embase, Web of Science, Cochrane Library from their inception to August 22, 2025, for literature on themes such as intracranial infection ,central nervous system infection, encehalitis, meningitis, meningoencephalitis, brain abscess, linezolid and vancomycin.

Participant or population Patients who have had central nervous system infections and have used linezolid or vancomycin.

Intervention linezolid.

Comparator vancomycin.

Study designs to be included We conducted a systematic review and meta-analysis at the study level to evaluate the efficacy and safety of linezolid and vancomycin in treating central nervous system infections, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines. The primary outcome was the overall effectiveness rate, while secondary

outcomes included cure rate. Safety outcomes included mortality rate the incidence of hematologic adverse reactions and the incidence of adverse reactions outside the hematologic system. The authors declared that all supporting data wer.

Eligibility criteria 1. Clinically diagnosed with central nervous system infection or intracranial infection (including but not limited to encephalitis, meningitis, and meningoencephalitis); 2. All received linezolid and vancomycin for anti-infective treatment; 3. Obtainable post-treatment efficacy indicators (including but not limited to overall effectiveness rate, cure rate, marked efficiency rate, adverse reaction rate, and mortality rate).

Information sources PubMed, Embase, Web of Science, Cochrane Library.

Main outcome(s) The primary outcome was the overall efficacy rate.

Quality assessment / Risk of bias analysis The Newcastle-Ottawa Scale (NOS).

Strategy of data synthesis Statistical analysis was conducted using Review Manager 5.3. Count data were described using risk ratio (RR), odds ratio (OR), or risk difference (RD). Measurement data were described using mean difference (MD). I2 and chi-square tests were used to assess heterogeneity, with a significance level of $\alpha=0.1$.If heterogeneity existed ($I2>50\%$ and/or $P<0.1$), sources of heterogeneity were analyzed, and a random-effects model was used. If no heterogeneity existed ($I2\leq50\%$ and $P\geq0.1$), a fixed-effects model was used. Data were described using RR, OR, RD, MD, and their 95% confidence intervals (CI). A funnel plot was used to analyze publication bias, and sensitivity analysis was performed. $P<0.05$ indicated statistically significant differences.

Subgroup analysis No.

Sensitivity analysis No.

Country(ies) involved Department of Emergency,The Central Hospital of Xiangtan (The Affiliated Hospital of Hunan University) ,Hunan Province, China.

Keywords linezolid,vancomycin,central nervous system infections,meta-analysis.

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