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Seizure-free Outcome After Epilepsy Surgery :based on Meta-analysis

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Ou, SJ.

Corresponding author:
Sijie Ou

miracleoo@126.com

Author Affiliation:
The First affliated Hospital of Guangxi Medical University.

ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - The review has not yet started.

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 15 February 2026 and was last updated on 15 February 2026.

INTRODUCTION

Review question / Objective Population: drug-resistant epilepsy patient Intervention:epilepsy surgery Comparison:no epilepsy surgery Outcome:seizure-free Study design:case-control studies and cohort studies.

Condition being studied The Engel classification system7 and International League Against Epilepsy(ILAE) scale8 were used for seizure outcome assessment.ILAE 1 and Engel class I were considered when the patient was seizure-free following surgery.For drug-resistent epilepsy patients who met the surgery indication and were admitted, the seizure-free and seizure recurrence groups were based on surgery outcomes.

METHODS

Participant or population Drug-resistant epilepsy patient.

Intervention Epilepsy surgery.

Comparator No epilepsy surgery.

Study designs to be included Case-control studies and cohort studies.

Eligibility criteria Inclusion criteria:1)The Engel classification system7 and International League Against Epilepsy(ILAE) scale8 were used for seizure outcome assessment.ILAE 1 and Engel class I were considered when the patient was seizure-free following surgery;2)For drug-resistent epilepsy patients who met the surgery indication

and were admitted, the seizure-free and seizure recurrence groups were based on surgery outcomes;3)Previous research had examined the influencing factors for the outcome of epilepsy surgery;4)The study types were case-control studies and cohort studies;5)The odds ratio (OR) and 95% confidence interval (CI) for seizure-free after surgery influencing factors were provided in the original literature, or the OR value and 95%CI could be calculated from the reported data.

Information sources Two researchers trained in systematic literature search searched PubMed, EMbase, the CochraneLibrary, CNKI, Wanfang, VIP, and China biomedical literature databases (CBM) for a prospective or retrospective study of seizure-free factors after epilepsy surgery until July 2024.

Main outcome(s) Seizure-free.

Quality assessment / Risk of bias analysis Two investigators independently evaluated the quality of the included studies using the Newcastle-Ottawa Scale (Newcastle-OttawaScale, NOS)10, including the selection of the study population, comparability between groups, and influencing factors.The literature was of high quality, as evidenced by the cumulative score of 9, which was greater than or equal to 7. After the evaluation, the investigators cross-checked and reviewed any discrepancies.

Strategy of data synthesis The data were analyzed using RevMan 5.4 software. Since the outcome “seizure-free” was a continuous variable and the tools were consistent, the mean difference and its 95% confidence interval were chosen as the effect size. The statistical heterogeneity among the included studies was first assessed using the I statistic. If $I^2 \leq 50\%$, a fixed-effect model was used for the meta-analysis; if $I^2 > 50\%$, a randomeffects model was used for the synthesis and the results were interpreted with caution. For outcomes with significant heterogeneity, a subgroup analysis was planned according to the dose of administration and the duration follow-up to explore the source of heterogeneity. In addition, a sensitivity analysis was performed by removing each study one by one to evaluate the stability of the combined results. Finally a funnel plot combined with the Egger test was used to evaluate potential publication bias.

Subgroup analysis The included studies were divided into two or more subsets according to the prespecified subgroup variables (e.g., age, subtype of disease duration of illness), and a meta-analysis was performed on each subset to obtain the combined effect estimate (e.g., OR, RR, MD) and the corresponding95% confidence interval. The subgroup analysis used a random-effects model. In software (e.g., RevMan, Stata, R), a “test subgroup differences” was conducted directly. The software calculated a P value to judge the presence of interaction. Usually, a P value for interaction < 0.05 or $< .10$ was considered significant, indicating that there were significant differences in the effects between subgroups. Subgroup analysis should also examine whether the heterogeneity (I^2) within each subgroup noticeably reduced after grouping. If the heterogeneity within a subgroup disappeared or significantly reduced, it suggests that the grouping factor was likely the source of heterogeneity.

Sensitivity analysis Swap the results of the fixed effects model and the random effects model for comparison. If the results of the two models are consistent, it indicates that the conclusion is less affected by model selection; if there is a big difference, it suggests the presence of heterogeneity or small studyeffects.

Country(ies) involved China.

Keywords epilepsy surgery,drug resistant,seizure-free,outcome.

Contributions of each author

Author 1 - Sijie Ou.
Email: miracleoo@126.com