

# INPLASY

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## Is there a link between cognitive impairment and hippocampal sclerosis in patients with temporal lobe epilepsy: A systematic review and meta-analysis

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## ADMINISTRATIVE INFORMATION

**Support** - The National Natural Science Foundation of China (81960889).

**Review Stage at time of this submission** - Data analysis.

**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 25 November 2023 and was last updated on 25 November 2023.

## INTRODUCTION

**Review question / Objective** This meta-analysis aims to verify whether hippocampal sclerosis is a warning factor for epilepsy complicated with cognitive impairment and provide some reference value for future related research and clinical diagnosis and treatment of epilepsy complicated with cognitive impairment.

**Condition being studied** Epilepsy is a common and complex neurological clinical syndrome. Temporal lobe epilepsy is the most common type of epilepsy. A large number of studies have reported that long-term seizures will affect the cognitive function of patients, resulting in different types and degrees of cognitive function impairment in patients, involving language, memory, executive ability, attention, and other aspects, seriously and even affecting the quality of life of patients. The specific mechanisms and influencing factors that cause these cognitive impairments are still unclear. The medial structure

of the temporal lobe in patients with temporal lobe epilepsy is often damaged to varying degrees, among which hippocampal sclerosis is one of the common primary pathological bases of temporal lobe epilepsy. The hippocampus structure is one of the important structural links in the neural circuits related to learning, memory, and cognition and is closely related to the body's learning ability, memory, and emotional regulation. Is hippocampal sclerosis associated with cognitive impairment in temporal lobe epilepsy? How hippocampal sclerosis affects cognitive function in temporal lobe epilepsy remains unknown.

## METHODS

**Search strategy** The analysis involved searching by Web of Science, PubMed, Cochrane Library, Embase by Ovid, medRxiv, bioRxiv, PsycARTICLES Chinese Academic Journals Full Text Database (CNKI), Chinese Science and Technology Journals Database (VIP) clinical trials, WAN-Fang Database, and the reading show

database. Depending on the database being searched, the following terms are used individually or in combination: "Hippocampus sclerosis", "hippocampal sclerosis", "Amon's horn sclerosis", "hippocampal gyrus sclerosis", "hippocampal atrophy", "medial temporal lobe sclerosis", "cognition", "cognitive impairment", "cognitive dysfunction", etc.

**Participant or population** Patients with temporal lobe epilepsy and their hippocampal sclerosis confirmed while excluding other lesions in other parts of the brain will be included. Patients with temporal lobe epilepsy with hippocampal sclerosis.

**Intervention** The temporal lobe epilepsy patients with hippocampal sclerosis was confirmed by neuroimaging or postoperative pathology.

**Comparator** The patients with temporal lobe epilepsy but without hippocampal sclerosis. hippocampal.

**Study designs to be included** The case-control, cohort, and nested case-control studies with clear year of study conduct or publication.

**Eligibility criteria** Inclusion criteria: (1) Subjects should be diagnosed with temporal lobe epilepsy. (2) Hippocampal sclerosis was confirmed in the patient, while other brain lesions were excluded. (3) The subgroups included in the study were temporal lobe epilepsy with hippocampal sclerosis and temporal lobe epilepsy without hippocampal sclerosis. (4) Relevant scale scoring data can be obtained from the literature. (5) The study included case control, cohort study and nested case control study. (6) There is a clear year in which the study was conducted or published. Exclusion criteria: (1) Repeated publications and low-quality literature. (2) non-Chinese and English literature; (3) Non-temporal lobe epilepsy patients. (4) The grouping does not meet the inclusion criteria; (5) Basic experiments and animal experiments; (6) Summary.

**Information sources** The analysis involved searching by Web of Science, PubMed, Cochrane Library, Embase by Ovid, medRxiv, bioRxiv, PsycARTICLES Chinese Academic Journals Full Text Database (CNKI), Chinese Science and Technology Journals Database (VIP) clinical trials, WAN-Fang Database, and the reading show database.

**Main outcome(s)** Hippocampal sclerosis is associated with cognitive impairment in temporal lobe epilepsy, which is mainly manifested as

memory impairment, intelligence, and language decline.

**Quality assessment / Risk of bias analysis** Two researchers assessed the quality of each study using the Newcastle-Ottawa Scale (NOS) quality assessment tool. References with an NOS score  $\geq 6$  were defined as high quality, and those with an NOS score  $\geq 6$  were defined as low quality. If there is disagreement during the evaluation process, a consensus can be reached through negotiation or through a third-party evaluation.

**Strategy of data synthesis** Meta-analysis was performed using RevMan 5.4 software. Intelligence, memory, executive power, language, attention, and MoCA were classified for meta-analysis.

**Subgroup analysis** None.

**Sensitivity analysis** The results were relatively robust.

**Language restriction** Chinese and English literature.

**Country(ies) involved** The First Affiliated Hospital of Guangxi University of Chinese Medicine, Guangxi University of Chinese Medicine, Nanning, China.

**Keywords** Temporal lobe epilepsy, Hippocampal sclerosis, cognitive impairment, Meta-analysis.

#### Contributions of each author

Author 1 - Jie Liu wrote the first draft of the manuscript and collated the data.

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Author 2 - Lun Cai was involved in the study's idea and design.

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Author 3 - Jianhua Tan participated in writing the first draft of the manuscript and collecting the data.

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