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# Acute ischemic stroke events complicated by acute kidney injury are associated with an increased risk of mortality: a systematic review and meta-analysis of prospective studies

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**ADMINISTRATIVE INFORMATION**

**Support -** None.

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

**Conflicts of interest -** None declared.

**INPLASY registration number:** INPLASY202580101

**Amendments -** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 31 August 2025 and was last updated on 31 August 2025.

## INTRODUCTION

**Review question / Objective** We performed a systematic review to calculate the overall prevalence of acute kidney injury (AKI) after acute ischemic stroke (AIS) in all relevant studies, assessing whether AKI is a frequent complication subsequent to AIS. Additionally, we conducted a general assessment of the impact of AKI on all-cause mortality after the occurrence of AIS events.

**Condition being studied** After the acute ischemic stroke (AIS) event, the existence of acute kidney injury (AKI) and chronic kidney disease has received considerable attention and has been well studied, although the conclusions are complex. The reported prevalence of AKI following AIS ranges from 2.2-43.3% in research studies, showing significant variation. Some studies report that AKI following AIS is a risk factor for all-cause mortality, while others do not. As of now, a comprehensive systematic review and meta-analysis concerning the occurrence of AKI after AIS and its influence on the rates of occurrence and death has not been conducted.

## METHODS

**Participant or population** Acute ischemic stroke (AIS) patients with or without acute kidney injury (AKI).

**Intervention** Not applicable.

**Comparator** Not applicable.

**Study designs to be included** Observational types, specifically cohort and retrospective studies.

**Eligibility criteria** Most of the studies included in this research provided a succinct definition of acute kidney injury (AKI), mainly based on the RIFLE system definition of AKI proposed by the Acute Dialysis Quality Initiative (ADQI) in 2002 (An elevation in (sCr to levels exceeding 1.5 times the

initial measurement; or a reduction in urine output to below 0.5 mL/kg·h sustained for over 6 hours)22, the definition of AKI by the Acute Kidney Injury Network (AKIN) as revised in 2005 (An elevation of sCr to a level of at least 26.5 μmol/L, or an increase in sCr to over 1.5 times the initial value, or a urine output of less than 0.5 mL/kg·h for a period exceeding 6 hours.)23, or the diagnostic criteria for AKI proposed by Kidney Disease Improving Global Outcomes (KDIGO) in 2012 (an increase in sCr to a level of at least 26.5 μmol/L within 48 hours; or a rise in sCr to greater than 1.5 times the initial value, which is apparent or can be inferred within a week; or urine output less than 0.5 mL/kg·h for a duration exceeding 6 hours).

**Information sources** Google Scholar, EMBASE, and PubMed.

**Main outcome(s)** The primary outcome was the prevalence of AKI following AIS events, and the secondary outcome was all-cause mortality.

**Quality assessment / Risk of bias analysis** We utilized the Newcastle-Ottawa scale (NOS) to evaluate the quality of the literature.

**Strategy of data synthesis** We obtained the prevalence of acute kidney injury (AKI) after acute ischemic stroke (AIS) and the aORs to mortality in each study by data extraction, followed by meta-analysis using OpenMetaAnalyst software. Heterogeneity of the study populations in the included studies was assessed by the index of inconsistency (I2), which describes the percentage of variation among studies due to heterogeneity rather than chance, with an I2 of 50% being considered significant for heterogeneity. Pooled prevalence as well as pooled aORs were subsequently calculated, specifically using the DerSimonian-Laird random-effects model if heterogeneity was significant and the fixed-effects model if heterogeneity was not significant.

**Subgroup analysis** Not applicable.

**Sensitivity analysis** We executed thorough sensitivity analyses by systematically excluding each study that reported on prevalence and mortality risk.

**Country(ies) involved** China.

**Keywords** acute kidney injury (AKI); acute ischemic stroke (AIS); prevalence, mortality.

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