

# INPLASY

## Association between interleukin-6 levels and stroke: a systematic review and meta-analysis

INPLASY202450089

doi: 10.37766/inplasy2024.5.0089

Received: 18 May 2024

Published: 18 May 2024

Huang, XY; Zhang, MM; Wang, JJ; Hu, FY.

### Corresponding author:

Huang Xinyi

hxinyi0499@163.com

### Author Affiliation:

School of Public Health, Bengbu Medical University, Bengbu, China.

### ADMINISTRATIVE INFORMATION

**Support** - This work was supported by the Natural Science Foundation for the Higher Education institutions of Anhui Province [grant No. 2022AH051533]; and Anhui Provincial Quality Engineering Project [grant No. 2021jyxm0942].

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

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202450089

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 May 2024 and was last updated on 18 May 2024.

### INTRODUCTION

**Review question / Objective** P (Population) : Stroke population. I (Intervention) : We didn't intervene. C (Comparison) : Non-stroke population (other patients in hospital or health check-ups). O (Outcome) : Serum interleukin-6 levels. S (Study design) : Case-control studies and cohort studies.

**Condition being studied** Stroke is a neurological disorder characterized by blockage of blood vessels. Blood clots can form in the arteries of the brain, blocking blood flow and clogging the arteries, causing the blood vessel to rupture and lead to bleeding. According to the 2019 Global Burden of Disease, Injuries, and Risk Factors Study (GBD), stroke is the second leading cause of death and disability worldwide in 2019, with more

than 5.5 million people dying from stroke each year. more than 50% of survivors suffer from severe disability, including loss of cognitive, language, and motor function.

### METHODS

**Participant or population** The subjects of the case group were diagnosed stroke patients, and the control group were non-stroke patients (other patients in hospital or health check-ups).

**Intervention** Our study does not set interventions.

**Comparator** Our study does not set interventions.

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

**Eligibility criteria** Citations selected from this initial search were screened and assessed for

eligibility according to the following inclusion criteria: (1) studies on the association between IL-6 and stroke, (2) the study type was case control study and cohort study, (3) the subjects of the case group were diagnosed stroke patients, and the control group were non-stroke patients, (4) measurement criteria: serum IL-6 level, the original can extract the mean and standard deviation or provide the original data that can be converted, (5) the original documents are all published documents. We excluded studies examining associations with (1) Repeated published studies, (2) animal experiments, (3) non-English articles, (4) reviews, case reports, conference abstracts and articles of relevant data are not available.

**Information sources** Pubmed database.

**Main outcome(s)** The study included 15 publications with a total of 1696 participants, with 975 cases in the case group and 721 cases in the control group. Meta-analysis showed that IL-6 levels were significantly higher in the stroke population than in the control group (SMD=1.22, 95% CI=0.79-1.64). Subgroup analysis showed that there was no significant difference in IL-6 assay detection methods heterogeneity between the two groups ( $I^2=0$ ,  $P=0.47$ ). The difference in heterogeneity test results between races was statistically significant ( $I^2=89.7\%$ ,  $P<0.01$ ). The results of the test of heterogeneity with different mean ages were also statistically significant ( $I^2=84.3\%$ ,  $P=0.01$ ).

#### **Quality assessment / Risk of bias analysis**

Publication bias was assessed using funnel plots.

**Strategy of data synthesis** In this meta-analysis, statistical analyses were performed with using the "meta" package of R 4.1.3. We calculated SMD and 95% CIs to estimate potential associations between IL-6 and stroke, with  $P<0.05$  being defined as statistically significant.  $I^2$  was used to evaluate inter-study heterogeneity statistics. If the random effects model  $I^2$  is greater than 50%, the DerSimonian and Laird method is used for analysis. Otherwise, the fixed effect model (Mantel-Haenszel) will be used for analysis.

**Subgroup analysis** We also performed subgroup analyses based on region, age, and IL-6 assay detection methods of the participants.

**Sensitivity analysis** The stability of the synthetic results was verified by sensitivity analysis. Using the exclusion method, the two papers with the largest and smallest weights were excluded, and changes in the differences in the results were

observed. The stability of the synthetic results was verified by sensitivity analysis.

**Country(ies) involved** China.

**Keywords** stroke, interleukin-6, inflammation, meta-analysis.

#### **Contributions of each author**

Author 1 - Huang Xinyi - Xinyi Huang conducted the study, conducted a literature search, determined the final included studies based on inclusion and exclusion criteria, extracted data from the included studies and assessed study quality, analyzed the data and prepared a draft of the manuscript.

Email: hxinyi0499@163.com

Author 2 - Zhang Manman - Manman Zhang extracted data from the included studies and assessed study quality.

Email: 1972638446@qq.com

Author 3 - Wang Jiaojiao - Jiaojiao Wang extracted data from the included studies and assessed study quality.

Email: 20012wj@163.com

Author 4 - Hu Fuyong - Fuyong Hu criticized and revised the manuscript.

Email: hufuyong@126.com