

# Ischemic stroke risk factors

## Atrial fibrillation

About 13-26% of all acute ischaemic strokes are related to non-valvular [atrial fibrillation](#), the most common cardiac arrhythmia globally.

[Atrial fibrillation](#) (AF) is increasingly recognized as the single most important cause of disabling ischemic stroke in the elderly.

## Atherosclerotic disease

[Atherosclerotic disease](#) of the [carotid artery](#) has a high prevalence in patients aged over 50 and is a major cause of [ischemic stroke](#).

Not less than 50% of all [ischemic strokes](#) appear to occur resulting from pathology of extracranial arteries. Occlusions and stenoses are more commonly encountered in carotid arteries, with the incidence of occlusion of the [internal carotid artery](#) (ICA) ranging from 5 to 10% within the structure of all lesions of [brachiocephalic artery](#) (BCA).

## Ethanol

Gorelick PB. Alcohol and stroke. Stroke. 1987; 18:268-271

## Vasoconstriction-Vasospasm

Levine SR, Brust JCM, Futrell N, et al. Cerebrovascular Complications of the Use of the 'Crack' Form of Alkaloidal Cocaine. N Engl J Med. 1990; 323:699-704

## microRNA

The etiological origins of ischemic stroke and resulting pathological processes are mediated by a multifaceted cascade of molecular mechanisms that are in part modulated by posttranscriptional activity. Accumulating evidence has revealed a role for [microRNAs](#) (MicroRNAs) as essential mediators of posttranscriptional gene silencing in both the physiology of brain development and pathology of ischemic stroke.

In a review, Li et al. compile MicroRNAs that have been reported to regulate various stroke risk factors and pre-disease mechanisms, including hypertension, atherosclerosis, and diabetes, followed by an in-depth analysis of MicroRNAs in ischemic stroke pathogenesis, such as excitotoxicity, oxidative stress, inflammation, apoptosis, angiogenesis and neurogenesis. Since promoting or suppressing

expression of MicroRNAs by specific pharmaceutical and non-pharmaceutical therapies may be beneficial to post-stroke recovery, they also highlight the potential therapeutic value of MicroRNAs in clinical settings <sup>1)</sup>.

## Intracranial aneurysm surgery

Ischemic complications during [intracranial aneurysm surgery](#) are a frequent cause of postoperative [infarctions](#) and new neurological deficits.

Although the [beach chair position](#) (BCP) is widely used during shoulder surgery, it has been reported to associate with a reduction in [cerebral blood flow](#), oxygenation, and risk of [cerebral ischemia](#).

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[CD137](#) gene is associated with risk of ischemic stroke in the northern Han Chinese. Moreover, CD137 gene polymorphism may be one mediating factor between diabetes and ischemic stroke <sup>2)</sup>.

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Secondary ischemic injury is common after acute brain injury and can be evaluated with the use of neuromonitoring devices.

[Cerebral venous sinus thrombosis](#) (CVT) is a rare [cerebrovascular accident](#).

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Impaired collateral blood flow through the [circle of Willis](#) is a recognized risk factor for [ischemic stroke](#).

## Air pollution

A study added to the evidence that short-term exposure to fine particular matter (PM2.5) may induce IS <sup>3)</sup>.

## Moyamoya disease

see [Moyamoya disease](#)

## Rheumatoid arthritis

The [purpose](#) of a [longitudinal follow-up study](#) was to investigate the [ischemic stroke risk](#) in patients with seropositive [rheumatoid arthritis](#) (RA) and controls who were matched in [age](#) and [sex](#). Patient data were collected from the National Health Insurance Service (NHIS) Health Screening (HEALS) cohort. Using the International Classification of Diseases code M05 (seropositive RA), with a

prescription of any disease-modifying anti-rheumatic drug (DMARD), RA was identified. A total of 2,765 patients and 13,825 control subjects were included in the study. The 12-year incidence of ischemic stroke in each group was calculated using the Kaplan-Meier method. The risk ratio of ischemic stroke was estimated using Cox proportional hazards regression. Sixty-four patients (2.31%) in the seropositive RA group and 512 (3.70%) in the control group experienced ischemic stroke ( $P < 0.001$ ) during the follow-up period. The hazard ratio of ischemic stroke in the seropositive RA group was 1.32 (95% confidence interval (CI), 1.02-1.73) after adjusting for age and sex. The adjusted hazard ratio of ischemic stroke in the seropositive RA group was 1.40 (95% CI, 1.07-1.82) after adjusting for demographics and comorbid medical disorders. According to the subgroup analysis, the hazard ratios of ischemic stroke risks in the female and hypertensive subgroups were 1.44 (95% CI, 1.05-1.97) and 1.66 (95% CI, 1.16-2.38), respectively. In the non-diabetes and non-dyslipidemia subgroups, the corresponding hazard ratios of ischemic stroke were 1.47 (95% CI, 1.11-1.95) and 1.43 (95% CI, 1.07-1.91). Seropositive RA patients have an increased risk of ischemic stroke. In female, hypertension, non-diabetes, and non-dyslipidemia RA subgroups, even without the traditional risk factors for stroke (except for hypertension), increased the risk, which could be potentially attributed to RA <sup>4)</sup>.

## Sickle cell disease

### Sickle cell disease

1)

Li G, Morris-Blanco KC, Lopez MS, Yang T, Zhao H, Vemuganti R, Luo Y. Impact of microRNAs on ischemic stroke: From pre- to post-disease. *Prog Neurobiol*. 2017 Aug 22. pii: S0301-0082(17)30033-3. doi: 10.1016/j.pneurobio.2017.08.002. [Epub ahead of print] Review. PubMed PMID: 28842356.

2)

Zhang S, Li Z, Zhang R, Li X, Zheng H, Ma Q, Zhang H, Hou W, Zhang F, Wu Y, Sun L, Tian J. Novel CD137 Gene Polymorphisms and Susceptibility to Ischemic Stroke in the Northern Chinese Han Population. *Neuromolecular Med*. 2017 Jul 28. doi: 10.1007/s12017-017-8457-7. [Epub ahead of print] PubMed PMID: 28755037.

3)

Hu W, Chen Y, Chen J. Short-term effect of fine particulate matter on daily hospitalizations for ischemic stroke: A time-series study in Yancheng, China. *Ecotoxicol Environ Saf*. 2020 Oct 22;208:111518. doi: 10.1016/j.ecoenv.2020.111518. Epub ahead of print. PMID: 33120271.

4)

Lee DH, Sheen SH, Lee DG, Jang JW, Lee DC, Shin SH, Han IB, Hong JB, Kim H, Sohn S. Association between ischemic stroke and seropositive rheumatoid arthritis in Korea: A nationwide longitudinal cohort study. *PLoS One*. 2021 May 17;16(5):e0251851. doi: 10.1371/journal.pone.0251851. PMID: 33999944.

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