

# Cold weather linked to increased stroke risk in atrial fibrillation patients

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Micrograph showing cortical pseudolaminar necrosis, a finding seen in strokes on medical imaging and at autopsy. H&E-LFB stain. Credit: Nephron/Wikipedia

Cold weather is associated with increased risk of ischaemic stroke in patients with atrial fibrillation, according to research presented at ESC Congress today by Dr Tze-Fan Chao, cardiologist at Taipei Veterans General Hospital and the National Yang-Ming University in Taiwan.<sup>1</sup> The study in nearly 290 000 patients suggests that cool climate may be

an underrated issue for health that deserves more attention.

"Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia and it increases the risk of ischaemic [stroke](#) by four- to five-fold," said Dr Chao. "During AF, the electrical activity of the [left atrium](#) is disordered and the contraction is ineffective which results in stasis of blood in the atrium. The blood pools and becomes sluggish and can result in the formation of blood clots. If a clot leaves the heart and travels to the brain, it can cause a stroke by blocking the flow of blood through cerebral arteries."

The autumn/winter season has been associated with a higher incidence and mortality rate of myocardial infarction, stroke and [congestive heart failure](#). A greater plasma fibrinogen level and factor VII clotting activity in the winter have been reported as possible mechanisms.

"The elevation and activation of these coagulation factors may lead to a pro-coagulant status in cool climates which may promote the formation of [blood clots](#) within the left atrium and increase the risk of stroke for AF [patients](#)," said Dr Chao. "However until now it was unclear whether the risk of ischaemic stroke was higher in AF patients during cool seasons or on days with a lower temperature."

The study investigated this issue in 289 559 new-onset AF patients from the "National Health Insurance Research Database" in Taiwan during 2000 to 2011. Average daily temperatures in six regions of Taiwan were obtained from the Central Weather Bureau and average temperatures of each month and season were calculated. Taiwan is a small island and the differences in temperature between different regions were not large. The researchers therefore averaged the temperatures in the six regions to calculate the country average. The risk of ischaemic stroke was estimated for each month and season.

Among the Taiwan AF cohort, 34 991 patients suffered from an ischaemic stroke during the mean follow up of three years. The risk of ischaemic stroke was higher among the months with a lower average temperature. In addition, the incidence of ischaemic stroke was highest in winter and lowest in summer. Compared to summer, the risk of ischaemic stroke increased by 10% in spring and 19% in winter. Stroke risk did not differ significantly between summer and autumn.

"Our study shows a clear association between temperature and risk of ischaemic stroke in patients with AF," said Dr Chao. "Risk may increase in cold weather because of the pro-coagulant status."

A 5 °C decrease in daily temperature within 14 days before the stroke occurred was associated with an increased risk of stroke with an odds ratio of 1.128 (95% confidence interval [CI] = 1.061-1.199, p

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