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New stroke gene discovery could lead to tailored treatments

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An international study led by King's College London has identified a new genetic variant associated with stroke. By exploring the genetic variants linked with blood clotting – a process that can lead to a stroke – scientists have discovered a gene which is associated with large vessel and cardioembolic stroke but has no connection to small vessel stroke.

Published in the journal Annals of Neurology, the study provides a potential new target for treatment and highlights genetic differences between different types of stroke, demonstrating the need for tailored treatments.

About 15 million people worldwide suffer a stroke each year. Of these, five million die and another five million are left permanently disabled, according to numbers from the World Health Organization (WHO). Risk factors for a stroke are high blood pressure, a heart rhythm disorder, high blood cholesterol, tobacco use, unhealthy diet, physical inactivity, diabetes and advancing age.

A stroke occurs when the blood supply to the brain is cut off, often due to a blood clot blocking an artery that carries blood to the brain, which then leads to brain cell damage. Coagulation (blood clotting) abnormalities, particularly easy clotting of the blood, are therefore common contributing factors in the development of stroke.

Dr Frances Williams, Senior Lecturer from the Department of Twin Research and Genetic Epidemiology at King's and lead author of the

paper, said: 'Previous studies have demonstrated the influence of genetic factors on the components of coagulation. The goal of this study was to extend these observations to determine if they were further associated with different types of stroke.'

The research was carried out in three stages. The first consisted of a genome-wide association study (GWAS) in 2100 healthy volunteers which identified 23 independent genetic variants that were involved in coagulation. The second stage examined the 23 variants in 4200 stroke and non-stroke cases from centres across Europe (Wellcome Trust Case Control Consortium 2 and MORGAM collections) and found that a particular mutation on the ABO gene was significantly associated with stroke.

Stage three of the study used the MetaStroke cohort, a project of the International Stroke Genetics Consortium which comprises 8900 stroke cases recruited from centres in the Europe, USA and Australia, whose DNA has been collected and undergone GWA scan. It was confirmed that a variant in the ABO blood type gene was associated with stroke, a finding specific to large vessel and cardioembolic stroke.

Dr Williams said: 'The discovery of the association between this genetic variant and stroke identifies a new target for potential treatments, which could help to reduce the risk of stroke in the future. It is also significant that no association was found with small vessel disease, as this suggests that stroke subtypes involve different genetic mechanisms which emphasises the need for individualised treatment.'

More information: onlinelibrary.wiley.com/journa … 1002/(ISSN)1531-8249

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