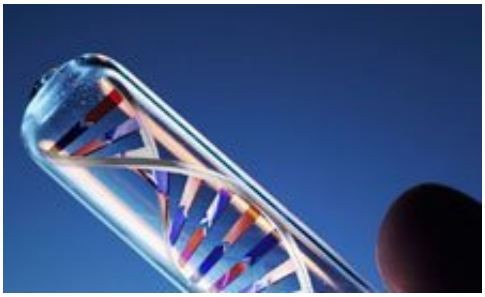
New genetic variant linked to risk of stroke and heart attack

July 4 2014



(Medical Xpress)—Researchers at King's College London have identified a genetic variant associated with an increased risk of stroke and heart attack.

Stroke and heart attack are caused when arteries, already clogged up by fatty substances (a condition known as atherosclerosis), become completely blocked by the formation of a blood clot. Risk factors for this include smoking, high blood pressure and high cholesterol.

The findings, published today as two separate papers in *PLOS ONE* and funded by Guy's and St Thomas' Charity, suggest a new genetic link caused by a variation in a protein known as 'glycoprotein IIIa'. This genetic variant is found in platelets, a type of blood cell involved in the formation of blood clots.

These findings may, in future, allow clinicians to identify patients who are at particularly high risk of stroke or heart attack by looking for the genetic variant. This would represent advancement on current practice, which mainly addresses risk factors such as smoking and high blood pressure.

Previous findings surrounding this genetic variant have been inconsistent and the study at King's represents the first large-scale meta-analysis of the literature, including over 50,000 participants from a combined total of 82 studies.

In the UK over 150,000 people have a stroke every year. Stroke is the third largest cause of death after heart disease and cancer. A stroke occurs when blood supply to part of the brain is cut off, leading to damage of brain cells. There are around 103,000 heart attacks in the UK each year, caused by blockage of a coronary artery that supplies blood to the heart and resulting in damage to heart muscles.

In the first research paper, which examined stroke patients, researchers found that carrying the PlA2 genetic variant of glycoprotein IIIa was associated with an increased risk of thrombotic stroke – that is, stroke caused by a blood clot. This equated to a higher risk of around 10-15 per cent, which was even stronger (amounting to a 70 per cent increase in risk) in people who carried two copies of this gene variant. The variant was not associated with haemorrhagic stroke, which is caused by bleeding into the brain.

The second research paper found that the same genetic variant was also associated with an increased risk of heart attack. This link was stronger in younger than in older patients, which is likely to reflect the greater influence of other cardiovascular risk factors in older patients (such as smoking and high cholesterol), according to the researchers.

Albert Ferro, Professor of Cardiovascular Clinical Pharmacology at King's College London, said: 'The genetic risk found in stroke and heart attack patients is likely to be caused by over-active platelets. Under normal circumstances, platelets help your body form clots to stop bleeding, but in these patients platelet activation has the undesired effect of causing their narrowed arteries to be blocked off completely. In future it may be possible to reduce the chances of this happening by examining patients for this variant on a blood test, so that if they carry the PlA2 form - and especially if they carry two copies of it - such patients could be identified for a more determined reduction of risk factors such as smoking, high blood pressure or high cholesterol.'

More information: Read the *PLOS ONE* research papers online:

'The PlA1/A2 Polymorphism of Glycoprotein IIIa as a Risk Factor for Myocardial Infarction: a Meta-Analysis'

'The PlA1/A2 Polymorphism of Glycoprotein IIIa as a Risk Factor for Stroke: a Systematic Review and Meta-Analysis'

Provided by King's College London

Citation: New genetic variant linked to risk of stroke and heart attack (2014, July 4) retrieved 19 April 2024 from https://medicalxpress.com/news/2014-07-genetic-variant-linked-heart.html

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