Higher iron levels associated with increased risk of certain types of stroke

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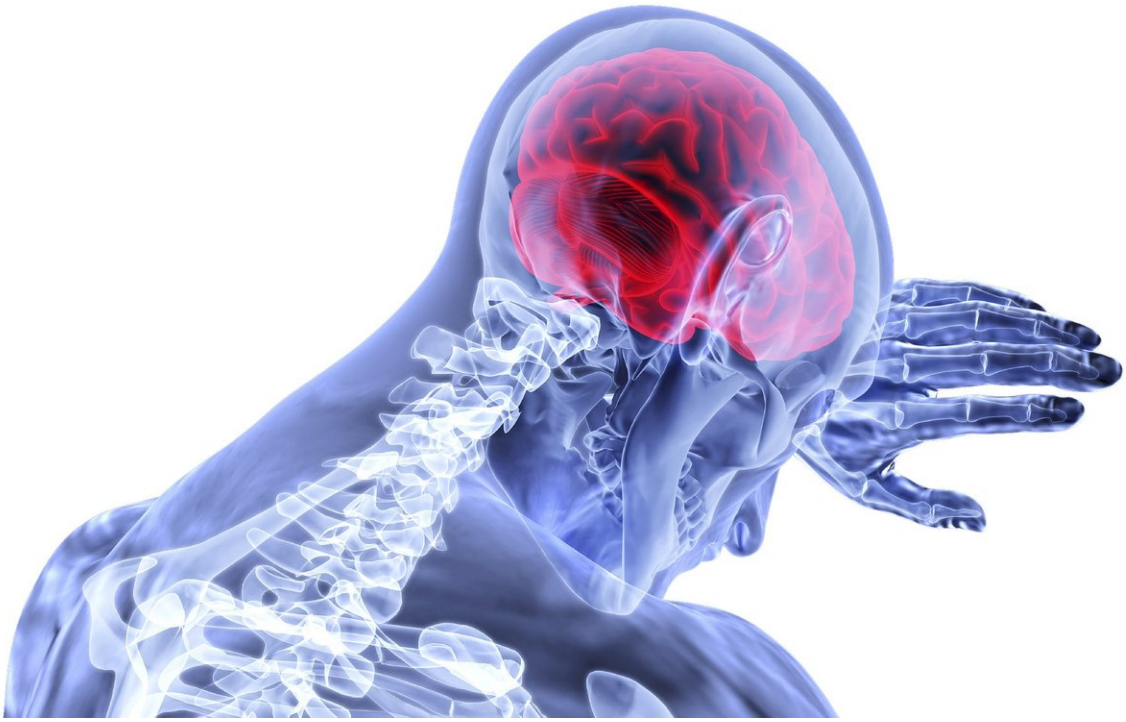

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People with higher iron levels may be at greater risk of certain types of stroke, a new study has found.

Researchers from Imperial College London analysed genetic data from over 48,000 people and revealed that higher iron levels are associated

with an elevated risk of a certain type of stroke, called a cardioembolic stroke. These strokes are typically caused by blood clots travelling from the heart to the brain, and blocking blood and oxygen supply. They are often associated with a type of heart condition called atrial fibrillation, which causes an irregular heart beat and affects around one million people in the UK.

The findings, published in the journal *Stroke*, follows previous research that suggests that iron may protect against stroke and coronary artery disease.

Dr. Dipender Gill, who is lead author of the study from Imperial's School of Public Health, said: "This result was unexpected. It was previously thought higher iron levels might protect against stroke, but this study investigates this further to find that iron may actually increase the risk of some types of stroke."

Dr. Gill, funded by the Wellcome 4i Clinical Ph.D. Programme at Imperial College London, added that although the research is at too early a stage to recommend people assess their own iron intake, the work suggests further studies are now needed to investigate why iron may lead to increased risk: "Iron is a vital nutrient, essential for a number of biological processes in the body, including transporting oxygen. However, previous research has suggested that in some cases iron can actual trigger blood to form a clot. This now needs further investigation."

Genetic clues

The research team investigated the link between iron and stroke using a statistical method called Mendelian Randomization. Using genetic data from public databases, the team searched through data for more than 48,000 people to work out the impact of genetics on people's iron status. They focused on three points in the genome where a single 'letter'

difference in the DNA – called a single nucleotide polymorphism (SNP) – can slightly increase or reduce a person's iron status.

When the researchers searched for these same SNPs in datasets including more than 60,000 stroke patients, they found that those with the SNPs for higher iron status had a higher risk of cardioembolic stroke.

However, the researchers caution against anyone reducing their iron intake, and explain the next step would be to validate the findings in further study.

Preventative treatments

"This is an early-stage finding, and we would certainly not recommend that patients at risk of stroke reduce their iron intake, as it has many crucial roles in the body," explained Dr. Gill. "However, our research does suggest doctors and scientists should now work towards further studies that investigate iron levels on the risk of different types of stroke, and cardiovascular disease more generally."

The research team, including Dr. Abbas Dehghan and Dr. Ioanna Tzoulaki at Imperial College London's School of Public Health, also used the same statistical technique to investigate other factors that may affect stroke risk.

Their work revealed people who have a naturally high number of cells called platelets, which are crucial to blood clotting and help to prevent bleeding, may have a higher risk of ischaemic stroke, which are caused by clots blocking blood supply to the brain.

Other work also suggested people with lower levels of a substance that helps the blood to clot, called Factor XI, may have a lower risk of

cardioembolic stroke. Researchers are currently investigating new treatments that help reduce the risk of stroke by cutting levels of Factor XI, and these new findings confirm that these types of drugs may hold promise.

Dr. Gill added: "All these findings highlight potential treatments or lifestyle interventions that may help reduce stroke risk, and that they may offer avenues for further study.

"Stroke is the second leading cause of death worldwide and causes around 32,000 deaths every year in the UK. But the disease is complicated – we now know that there are many distinct types, each with different causes. As we help unravel this further, it will give us a better picture of how to protect patients from stroke."

More information: D Gill et al. Iron Status and Risk of Stroke: A Mendelian Randomization Study*Stroke*. 2018;0:STROKEAHA.118.022701

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