Stroke-causing mutant gene identified by scientists—along with a potential treatment

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(Medical Xpress)—A genetic mutation that can lead to haemorrhagic stroke has been identified by scientists – along with a drug to potentially treat it.

Research published in the journal *Human Molecular Genetics* highlights a mutation in the gene COL_{4a2} that causes bleeding in the brain.

COL_{4a2} is a protein that is expressed by the gene of the same name, which forms a structure outside the cell called a basement membrane. This membrane is present in many tissues including blood vessels. Mutations in this protein have been expected to cause disease due to structural defects in those membranes.

However, scientists have now identified for the first time that accumulation of the mutant protein inside the cell can influence the development of haemorrhagic stroke.

Importantly, however, the scientists were able to treat the disease in cells grown in a culture dish by using a drug which has been approved for human patients. These results highlight its potential future therapeutic use for stroke.

Dr Tom Van Agtmel of the Institute of Cardiovascular and Medical Sciences at the University of Glasgow who led the study, said: "Haemorrhagic stroke accounts for half of all stroke cases in children and currently there is no treatment.

"Although it is expected that only a small number of patients will have defects in this membrane, this research gives us a better understanding of how this type of stroke develops. Importantly, it has identified how we might treat it in some cases. However, this is just one genetic mutation we've identified and analysed so there is still a long way to go, but it's a start."

The researchers obtained their results by analysing skin biopsies from a father a son with a family history of porencephaly – a cavity in the brain caused by perinatal haemorrhagic bleeding which can result in seizures and paralysis.

Both father and son carried the genetic mutation but only the son displayed the accumulation of the mutant protein inside the cell.

Dr Van Agtmael added: "The next stage will be to see if the drug treatment works in an animal model. If it does then this is a first step towards investigating its potential in human patients with this type of stroke using the pre-existing, approved drug."

More information: hmg.oxfordjournals.org/content …ddt418.full.pdf+html

Provided by University of Glasgow