Subarachnoid hemorrhage more commonly caused by environmental factors than genes

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The large Nordic twin study investigating the heritability of subarachnothe role of genetic factors underlying the development of SAH suggests that the role of genetic factors underlying the development of SAH is less than previously believed.

The prevalence of subarachnoid haemorrhage (SAH) is almost three times as high in Finland and Japan as among other nationalities. In Finland, some 1,000 cases are diagnosed every year, with almost half of the cases ending in death. SAH predominantly affects the working age population. Haemorrhage occurs when an aneurysm, a balloon-like bulge in the wall of the cerebral artery, ruptures.

Cerebral aneurysms and haemorrhages from ruptured aneurysms have been studied extensively in Finland. Töölö Hospital of Helsinki University Central Hospital (HUCH) in Helsinki is one of the best-known centres for the neurosurgical treatment of SAH in the world.

During the past few decades, the genetic makeup has been regarded as playing a significant role in the development of SAH. Contrary to this belief, however, a twin study recently published in the renowned journal *Stroke* showed that environmental factors account for most of the susceptibility to develop SAH Conducted in Finland, Sweden and Denmark, the study is the largest population level twin study in the world.

"This information is important for the families of SAH patients and for

doctors," says Miikka Korja, head of the research team and neurosurgeon at the HUCH Neurosurgery Department. "On an average, close family members of SAH patients have a low risk of developing SAH, and this risk may be further reduced by modifying lifestyle and environmental factors. This means that instead of screening the close family members of SAH patients, the focus of preventive treatment may now be increasingly shifted to the efficient management of hypertension and smoking cessation intervention. This is what we do with other cardiovascular diseases as well."

The Nordic study combined data on almost 80,000 pairs of twins over several decades. All in all, the follow-up time of all of the twin pairs corresponds to a staggering 6 million person-years.

The researchers nevertheless emphasize that there are rare cases of families among whose members SAH is significantly more common than in the overall population. In these cases genetic factors are the principal cause underlying the development of the disease. The challenge is to identify these rare families and provide accurate genetic counselling and preventive treatment.

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