Intracranial aneurysm risk factor

There are many risk factors for the development of intracranial aneurysms, both inherited and acquired. Females are more prone to aneurysm rupture, with SAH 1.6 times more common in women. The prevalence of aneurysms is increased in certain genetic diseases.

see Intracranial aneurysm in autosomal dominant polycystic kidney disease.

Other diseases such as Ehlers-Danlos syndrome, neurofibromatosis, and a1-antitrypsin deficiency also demonstrate a link.

Marfan Syndrome was once thought to be linked to intracranial aneurysm formation, but recent evidence suggests that this may not be true.

Aneurysms also run in families in the absence of an identified genetic disorder, with a prevalence of 7% to 20% in first or second degree relatives of patients who have suffered a SAH [1) 2)].

Besides an HLA-associated genetic factor, the most widely accepted risk factors are arterial hypertension, female gender, and increasing age. Some aneurysm patients have a deficient formation of Type III collagen. This seems to interfere with the mechanical integrity of the cerebral arterial wall encouraging aneurysm formation. While some of the risk factors may be involved in the process of aneurysm formation, others may be of importance in the actual aneurysm rupture [3)].

Smoking and family history are risk factors for sIA formation and aneurysmal SAH at young age. Young aneurysmal SAH patients had lower PHASES scores and often rupture from a small sIA, suggesting need for more aggressive management [4)].

The Kuopio intracranial aneurysm (IA) Patient and Family Database includes all 4,411 IA patients admitted to the Kuopio University Hospital from its defined Eastern Finnish catchment population since 1980.

Kurtelius et al. fused IA database with hospital diagnoses for IA patients and their 46,021 relatives from a national registry to identify couples concordant for IA disease. Penetrance of IA disease and hypertension were studied in these families.

A total of 3,659 IA patients had 1 or more children. In total, 18 couples concordant for the IA disease with a total of 48 children, all born healthy, were identified. Hypertension was diagnosed in 23 (64%) of the 36 parents, and 7 of the 12 sporadic-sporadic couples were concordant for hypertension. Six sporadic-sporadic couples were concordant for subarachnoid haemorrhage (SAH). None of the 24 children to the 12 sporadic-sporadic couples had been diagnosed with SAH or IA disease. Instead, 11 (46%) of the 24 children to the 6 familial-sporadic couples had a diagnosed with SAH or IA disease.

Couples concordant for IA disease are uncommon but not exceedingly rare. Biparental sporadic exposure does not seem to increase the risk of a clinically diagnosed IA disease or SAH in the offspring. IAs were common in the children with biparental sporadic-familial exposure [5)].

References

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