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Ischemic Stroke Subtypes and Migraine with Visual Aura

İskemik İnme Alt Tipleri ve Görsel Auralı Migren

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Various epidemiologic studies have shown that migraine with visual aura is related with increased risk of ischemic stroke. Also, subclinical infarctions are reported to be related with migraine. However, the relationship between migraine without aura and ischemic stroke is still controversial. In the "Atherosclerosis Risk in Communities" trial, different from other trials, the relationship between ischemic stroke subtypes (thrombotic, cardioembolic and lacunar) and migraine with and without aura was investigated. In the trial, 12,758 subjectsa previous history of ischemic stroke were followed up prospectively between 1993-1995 and December 2012 in terms of developing ischemic stroke in a 20-year-period (1).

The mean age of the subjects at the beginning of the study was 59 years (range, 49-73 years) and 12.6% had migraine (3.6% migraine with visual aura and 9% without visual aura).

As a result, 6% of the subjects and 5.3% of the migraineurs developed ischemic stroke. The relationship between migraine with visual aura and ischemic stroke was statistically significant [Hazard ratio (HR): 1.67, p=0.014]. However, the relationship between migraine without visual aura and ischemic stroke was not statistically significant (HR: 1.2, p=0.28). In patients with migraine with visual aura, the risk of developing thrombotic and lacunar infarctions did not change, whereas the risk of developing cardioembolic stroke was increased (HR: 3.7, p=0.003).

The risk of developing cardioembolic stroke in older patients with migraine with visual aura was significantly increased compared with patients with migraine without visual aura, which was thought to be secondary to undiagnosed paroxysmal atrial fibrillation or patent foramen ovale (PFO).

Migraine with visual aura and cardioembolic stroke may share a common pathogenesis: distal embolization. PFO is not considered as a definite cause of cardioembolic stroke. PFO is a common disorder found in 25% of autopsy series and in 40-50% of patients with cryptogenic ischemic stroke. It has been reported that patients with migraine with visual aura have increased PFO prevalence and PFO could be a source for cardioembolism. Taken together, it could be concluded that migraine with visual aura could induce vasospasm, activate thrombocyte aggregation, and increase concentration of procoagulant factors. These vasoactive substances could directly or indirectly reach coronary arteries and cerebral vascular system in the presence of PFO and cause visual aura symptoms or ischemic brain injury if a large embolus is generated.

Interestingly, the changing level of calcitonin gene-related peptide in migraine attacks, which plays an important role in coronary vasodilation and acute migraine attack, could induce

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changes in coronary blood flow and therefore increase the risk of atrial fibrillation in cases of recurrent migraine attacks.

This study has some limitations. First, when a source of cardioembolism was detected, ischemic stroke was classified as a cardioembolic stroke; however, the presence of a source of cardioembolism does not have to be the cause of ischemic stroke. Second, embolism from artery to artery was classified as atherothrombotic ischemic stroke. Third, the diagnosis of lacunar stroke was based on imaging findings; therefore, ischemic strokes without imaging findings could be missed. Also, some of the lacunar strokes could be cardioembolic.

The strong sides of the study are in its prospective design, long follow-up period, and large-cohort population.

Despite having some limitations, this study showed that the risk of cardioembolic stroke is significantly increased in migraine with visual aura. There was no relationship between migraine without visual aura and increased risk of cardioembolic stroke. Nevertheless, prospective studies to reveal the pathophysiology of cardioembolic and cryptogenic stroke in migraine with visual aura are needed.

Reference

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