Unruptured Intracranial Aneurysm: Screening, Prevalence and Risk Factors

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Subarachnoid hemorrhage (SAH) due to ruptured intracranial aneurysm is life-threatening, and screening for unruptured intracranial aneurysm (UIA) in selected patients and providing treatment before rupture of selected aneurysms are medically and economically beneficial. Therefore, screening for UIA must be tailored to specific populations in order to balance the prevalence and risk of UIA, cost-effectiveness of screening tests, and the availability of effective and safe treatment.1,2 Of these, estimating the prevalence and risk factor of UIA by epidemiological study is methodologically challenging, requiring an optimal cohort for prospective studies with a large amount of data.3

In the last issue, Kim and colleagues4 evaluated the prevalence (3.77%) and risk factors (female predominance and hypertension) of UIAs from healthy individuals who underwent brain magnetic resonance angiography using 3T magnetic resonance imaging as part of a routine health examination. There have been several other studies evaluating the prevalence and risk factors of UIA in the literature. The studies were variable with regards to the population studied, indication for imaging, and method of detection (Table 1).4-13 The reported prevalence of UIA in the literature ranged 1.8–8.8%, and was 3.2% according to combined results from a systematic review and meta-analysis10 which was also similar to the result (3.77%) from Kim et al.4 In evaluating the risk factors of UIA, it was more common in women, older age, smokers, patients with hypertension, autosomal dominant polycystic kidney disease (ADPKD), or in individuals with family history of intracranial aneurysm of SAH. Consequently, Korean Clinical Practice Guidelines for UIA currently recommended that UIA should be screened according to the following three categories:1 1) patients who have 2 or more first-degree relatives with an intracranial aneurysm; 2) patients with ADPKD; and 3) regular screening tests for new aneurysms for patients previously treated with aneurysmal SAH. Although the current guidelines do not support widespread screening for intracranial aneurysms in the general population, additional screening may be considered in patients with other genetic or medical conditions associated with intracranial aneurysms.14

Recently, according to the data from Korean National Health Insurance Service (NHIS), the number of treatments for UIA has increased because of the increased detection rate as well as increase in number of hospitals capable

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of performing embolization of UIA. In studies analyzing data from a cohort of 1 million people from the Korean NHIS, the crude incidence of UIA increased steadily from 29.6 per 100,000 person-years in 2008 to 90.0 per 100,000 person-years in 2016. It is believed that this is due to an increase in the number of asymptomatic cerebral aneurysms discovered through screening rather than an increase in the number of development of cerebral aneurysms. Meanwhile, the incidence of ruptured intracranial aneurysm has decreased, which may be due to an increase in the treatment of UIA and improved management of hypertension through health screening. The worldwide incidence of SAH also declined between 1980 and 2010 in Europe, Asia and North America, in parallel with a global decline in prevalence of hypertension and smoking, which is also in good contrast with an increasing rate of diagnosis of UIA. The same study also showed increased incidence of SAH in Japan, and there is another report which showed no decline of incidence of SAH in Korean. Therefore, the regional or ethnic difference should also be considered for elucidating the effective relationship between the active screening and treatment of UIA, and their preventive effect for SAH.

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