Assessment of extracranial and intracranial atherosclerosis

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Editorial

Assessment of extracranial and intracranial atherosclerosis: Don't dismiss old school autopsy

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Atherosclerotic disease represents one of the leading causes of ischemic stroke worldwide, posing a major global public health concern [1]. The prevalence of patients with intracranial atherosclerotic disease (IAD) exceeds those of patients with extracranial atherosclerotic disease (EAD) [2]. Risk factors for IAD and EAD have been shown to differ, the former has for example been related to obesity and hyperlipidemia whereas the latter has been associated with hypertension, though not all studies concur [3]. Furthermore, ethnic differences play a major role in the location of atherosclerosis [3].

In the era of noninvasive population imaging studies of IAD such as the Atherosclerosis Risk in Communities (ARIC) initiative [4,5], there is still a necessity for old-fashioned gold standard morphometric autopsy studies. Although recent advantages in noninvasive imaging have resulted in the possibility of IAD assessment using magnetic resonance imaging and ultrasound techniques [6], autopsy studies are still preferred for accurate assessment and visualization of atherosclerotic plaques. For example, some anatomical locations, including the distal arterial branches, have proven to be a major challenge for noninvasive imaging methods, whereas they pose no challenge for autopsy morphometric evaluation. In this issue of *Atherosclerosis,* Suemoto et al. describe a large population (661 community-dwelling elderly) based autopsy study in which they examine atherosclerotic disease in the form of stenosis in the common (CCA) and internal carotid arteries (ICA), and relate their findings to several risk factors in a population with a diverse ethnic origin [7]. Interestingly, they also investigated the association of IAD with EAD.

Suemoto et al. confirmed that in their Brazilian population, IAD was indeed slightly more common than EAD (59% and 51%, respectively). Due to the unique design of their autopsy study, subjects were included when they died from natural or unknown causes, hence the sampling was not biased towards cardiovascular disease (including stroke). Therefore, the reported prevalence and associations with risk factors are better generalizable than other imaging and autopsy studies that tend to focus on cardiovascular disease [8,9]. Importantly, it was shown that EAD was associated with more than twice the odds of having IAD. Furthermore, risk factors associated with EAD included Caucasian race, hypertension, and smoking, whereas risk factors for IAD included older age, less years of education, hypertension, diabetes, and a previous history of stroke. Due to the considerable sample size, these differences in atherosclerotic disease risk factors are not likely the result of differences in statistical power, but they rather constitute different underlying causal mechanisms. Moreover, these differences may provide valuable insights into preventive risk-factor management strategies. Future population studies might include both *in vivo* noninvasive imaging and *postmortem* autopsy morphometric assessments, although the logistics of these types of studies might provide some interesting challenges.

Conflict of interest

The author declared he does not have anything to disclose regarding conflict of interest with respect to this manuscript.

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