Atherosclerosis is increasing among Japanese because of their changing lifestyle. Carotid ultrasound examination is a good non-invasive method of detecting atherosclerosis by measuring the intima–media thickness (IMT), plaque number (PN) and plaque score (PS). Atherosclerosis of the carotid artery is related with not only coronary artery disease (CAD), but also systemic atherosclerosis. However, in order to screen the high-risk subjects from the general population it is also important to consider cost performance in medical practice. Some body features that tend to indicate atherosclerosis have been found, such as central obesity, Achilles’ tendon thickness and xanthoma, and these are useful to identify subjects who have a high risk of atherosclerosis such as CAD. The ear-lobe crease (ELC) was first reported as an atherosclerosis risk factor in 1973, when it was reported by Frank. There have been several reports of the relationship between ELC and CAD. The ELC is a useful as a risk factor of CAD, because it can be seen at a glance. When I read that paper approximately 25 years ago, I also became interested in this marker, although I tried to evaluate the relationship between carotid atherosclerosis and the ELC in approximately 150 healthy individuals on an isolated island in the Seto Inland Sea, I could not prove the hypothesis. I concluded that the result was caused by the fact that it was a healthy population and that the ultrasound equipment at that time did not have a high enough resolution.

In this issue of the Circulation Journal, Dr Shrestha et al report the relationship between the ELC and carotid artherosclerosis among patients ordered to undergo carotid ultrasonography for various purposes. They assessed both ear lobes carefully and objectively evaluated the ELC using an evaluation sheet. A typical ELC was found in 61 of 212 patients (28.8%). Patients underwent ultrasonography without any prior knowledge about the ELC, to minimize the risk of examiner’s bias. The IMT in patients with the ELC was thicker than that of patients without a significant ELC. The presence of an ELC was also related to age, male sex, and hypertension, but not to diabetes or dyslipidemia. Of course, they analyzed the data using a multivariate regression model to adjust for age, sex, and hypertension. Even so, ELC was confirmed as an independent risk factor. They also evaluated and found differences in PN and PS, as well as IMT.

At least 2 reports have concluded that the ELC is of little value as a sign of atherosclerotic disease. Subjects in 1 study were only type II diabetics and although those authors reported that there were significant relationships between ELC and CAD or retinopathy, as well as age, male sex, and hypertension, the relationship between ELC and CAD disappeared after adjusting for other factors. That result might be because the effect of diabetes is stronger than that of the ELC in a diabetic patient group. Another report classified ELC into 3 grades, although no other reports have done that; the value of ELC might be only its presence. There are few reports describing the relationship between ELC and the carotid arteries. Celik et al found a relationship between ELC and IMT in a healthy population, but they only examined IMT. Although IMT is a useful parameter for evaluating the early stage of atherosclerosis, PS and PN are more useful for evaluating advanced atherosclerosis. In Shrestha’s report, the patients had various disease and thus, I consider their selection of these parameters to be reasonable.

I am also interested in the absence of a relationship between ELC and hyperglycemia, dyslipidemia, or smoking habit. These risk factors have a big impact on the development of atherosclerosis, as well as age, sex and hypertension. It might depend on the mechanism of ELC formation, for which there are various hypotheses, such as the degeneration of elastic fiber or changes in the ratio of collagen to elastin, as noted in the discussion by Shrestha et al. Dyslipidemia or hyperglycemia might not affect these mechanisms.

Shrestha et al report that ELC was an independent risk factor because it showed a significant correlation with IMT after adjustment for age and hypertension. In the subgroup analysis by age, the oldest quartile showed no difference between the ELC group and the control group, which was probably because of the impact of age on atherosclerosis being more significant than the ELC, especially in the elderly. ELC is a more important marker in the middle-aged group. The ELC increases with age, as almost all reports have stated. I am interested in this phenomenon, because I suspect individuals with the ELC develop atherosclerosis faster than those without it. As all reports of the ELC have
been from cross-sectional studies, I hope some researcher will conduct a follow-up study regarding this phenomenon.

All the study subjects were Japanese. Of course there are some different types of polymorphism among Japanese, on the whole they are a relatively uniform race. We have to examine the difference among races in healthy populations by age bracket and sex. Moreover, ear-lobe shape may also be related. There are still a lot of unanswered questions about the ELC.

References