Brachial Pulse Pressure and Cardiovascular Risk

To the Editor:

The study by Mosley et al.1 shows in a large population that, in the predictive value of cardiovascular (CV) risk, pulse pressure (PP) is less effective than systolic (SBP) or diastolic blood pressure (BP). This finding supports the usual approach of major current guidelines but also raises major questions related to SBP and PP (here measured exclusively at the site of the brachial artery).

First, the classification into SBP or PP reflects, in fact, a particular approach in the clinical management of CV risk. The former depends largely on the (arbitrary) definition of hypertension, whereas the latter involves risk in the totality of a given population. Indeed, PP is, by definition, a risk factor observed both in normotensive and hypertensive subjects. Furthermore, the understanding of PP requires us to admit that BP propagates at a given velocity (pulse wave velocity) along the totality of the arterial tree, involves the presence of wave reflections, and is characterized by the presence of aortic-brachial SBP and PP amplification. To our knowledge, nowadays, no guideline in the literature indicates such very simple and basic definitions of CV physiology.

Second, all of the statistical evaluations on SBP and PP have in common the same difficulty, ie, the problem of colinearity of the different components of BP measurements. This problem is poorly discussed in the literature, but the “principal component analysis” is one of the most available statistical methodologies to perform in such conditions. This was done only in a single article of the literature.2

Third, several groups have extensively shown that SBP and PP increase markedly with age, mostly for PP. The Framingham Study has indicated that the predictive value of PP is observed only at >60 years of age.3 When hypertension began to be considered as a “disease” to treat, most of the cohorts of the literature were studied on the basis of young hypertensive populations, as in the Chicago cohort. In such conditions, there is little chance that PP could be attributed exclusively to increased arterial stiffness. Thus, it is important nowadays to indicate in the various cohorts the number of subjects by age class and to obtain a long-term follow-up of subjects >70 years of age.

Finally, the population of this article1 has 2 major particularities that might explain some results: the mean age at entry in the cohort was 39 years, and at this age, it is well accepted that diastolic BP is the BP component that is more closely related to CV risk; and the follow-up is particularly long (33 years), so that a regression dilution bias should limit the ability of comparing the various BP components for CV risk prediction.

Disclosures

None.

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