Impacts of Population Aging on the Subtypes of Stroke

To the Editor:

As the most populous country, China has the largest number of stroke victims in the world. With the aging of population and changing of lifestyles in recent years, incidence and prevalence of stroke are increasing; rank of stroke as a cause of death in disease spectrum is shifting forward; socioeconomic costs of stroke are climbing; and there is no evidence that these trends will change in the near future. In contrast to these emerging problems related to stroke, research—especially epidemiological research—on stroke in the Chinese population is extremely rare. This shortage will become a hindrance for government in making a nationwide reform to the healthcare system in the near future. For this reason, the study by Zhao et al is of important reference not only for clinicians, but also for health policy makers.

Based on the follow-up data from a community population enrolled by Sino-MONICA (Monitoring Trends and Determinants in Cardiovascular Disease) Beijing project, the authors detected marked changes in both stroke incidence and subtypes during 1984 to 2004. Their results showed that age-adjusted incidence of ischemic stroke increased from 100.5/100,000 to 213.2/100,000, whereas incidence of hemorrhagic stroke decreased from 80.7/100,000 to 35.2/100,000 during 1984 and 2004. The authors attributed the increased ischemic stroke to the prevalence of risk factors for atherosclerosis and the decreased hemorrhagic stroke to improved hypertension control.

In addition to congratulating the authors’ accomplishment of such a comprehensive study, we want to emphasize the effects of population aging on the shift of stroke subtypes, which the authors did not mention when interpreting their results. In the late 1970s, Chinese government launched 2 major policies. One is the economy developing project; another is the “one-child” policy. Both of the strategies affected China’s population architecture fundamentally. The economy developing project resulted in decreased mortality, and the “one-child” policy resulted in decreased fertility. These dual motivations have accelerated population aging in China since the 1980s. According to the national census, the proportion of elderly aged 60 or older increased from <7.6% in 1984 to >10% in 2000. The number of the oldest has grown at a pace even faster than that of the total elderly population, and the tempo of aging is even faster in big cities such as Beijing and Shanghai than in other less developed areas.

This population aging may result in a shift of stroke subtype from hemorrhagic to ischemic. As shown in epidemiological studies, hemorrhagic stroke onsets at younger ages than ischemic stroke. The incidence of hemorrhagic stroke reach a peak at about 55 to 65 age range and begin to decrease slightly thereafter, whereas the incidence of ischemic stroke increases continuously with the advancing of age. This discrepancy is largely due to the unequal time lag between risk factor and the onset of different subtypes of stroke. For example, acute hypertension has frequently been reported as a cause of intracerebral or subarachnoid hemorrhage, whereas it is less possible to induce ischemic stroke. Thus, increased proportion of elderly, especially the oldest, in a given population will increase ischemic stroke and decrease hemorrhagic stroke.

The impacts of population aging on stroke incidences and subtypes were also indicated by the discrepancies between age-adjusted and unadjusted stroke incidences from Zhao’s study (Figure). At the earlier years of the study (1983–1993), the
age-adjusted and unadjusted incidences of stroke were at similar levels, but in the later years of the study (1994–2004), the adjusted and unadjusted incidents separated significantly. This trend indicated the rapid aging of population in the later years of the study; at the same time, proportion of hemorrhagic stroke decreased significantly (from 34.2% to 14.4%).

Although the control rate of hypertension in urban China increased from 3.4% in 1984 to 17.5% in 2002, the prevalence of hypertension during this period increased from 7.7% to 18.8% in China. So it can be deduced that the prevalence of uncontrolled hypertension actually increased dramatically from 7.4% to 15.5%. If this is true, decreased incidence of hemorrhagic stroke observed in this study should not be interpreted as a result of improved hypertension control.

Disclosures

None.

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