Alcohol Intake, Circadian Blood Pressure Variation, and Stroke

Takayoshi Ohkubo, Hirohito Metoki, Yutaka Imai

In this issue of Hypertension, Ohira et al1 reported that habitual alcohol intake was positively associated with higher daytime blood pressure (BP) and a large morning BP surge based on data from 539 middle-aged Japanese men in 3 rural communities (Ikawa in the northeastern area, Noichi in the southwestern area, and Kyowa in the central area) and a southwestern urban suburb, Yao (in Osaka prefecture).

As shown in the figure by Ohira et al,1 moderate drinkers (alcohol intake 23 to 46 g/d) and heavy drinkers (alcohol intake ≥46 g/d) had higher BP in the morning and during the daytime compared with nondrinkers, whereas there were no differences in BP during the 24-hour and nighttime periods among the alcohol intake groups. Because heavy alcohol intake increases the risk of stroke, especially hemorrhagic stroke, these results might indicate that a higher risk of hemorrhagic stroke in heavy drinkers is, in part, mediated by the effects of alcohol on circadian BP variation, considering previous reports that elevated morning BP and higher daytime BP levels were most closely associated with the risk of hemorrhagic stroke.2,3

Although Ohira et al1 excluded subjects taking antihypertensive medication, drinking habit was a significant determinant of masked “uncontrolled” hypertension diagnosed by morning home BP among treated hypertensive patients.4 Moreover, insufficient duration of action of antihypertensive agents, which is also a risk factor for higher morning BP,5 has been raised as an explanation of higher predictive power for stroke incidence of morning home BP among treated hypertensive patients.6 Thus, it is possible that, in patients treated with antihypertensive drugs with an insufficient duration of action, higher alcohol consumption might be more strongly associated with the circadian variation characterized by an elevated morning BP and higher daytime BP, leading to more pronounced risk of stroke.

Ohira et al1 have conducted annual cardiovascular risk surveys in the 4 communities studied since 1963 in the district of Yao City, Ikawa, and Noichi and since 1981 in Kyowa, and they have investigated important cardiovascular risk factors in the Japanese population. They introduced ambulatory BP monitoring into their survey in 1997. The 4 communities were geographically widely distributed from north to south and supposedly have very different environmental- and lifestyle-associated factors, including alcohol intake and dietary habits. In particular, Akita, a northeastern prefecture in which Ikawa is located, is well known to have the highest frequency of stroke, especially hemorrhagic stroke. Akita is also characterized by a higher prevalence of heavy sake drinkers, higher salt intake, and colder temperature in winter than many other prefectures.7 Alcohol intake is known to be associated with dietary and several other lifestyle factors related to BP, such as salt intake and exercise habit. Although Ohira et al1 adjusted for conventional risk factors such as body mass index, age, and smoking, these other potential confounders have not been factored into their analyses, thereby weakening the argument for a specific and independent association of alcohol intake with circadian BP variation. A previous experimental intervention study reported that red wine and beer similarly influenced the daytime BP increase,8 whereas no data are available regarding the effects of the other types of alcoholic beverage, such as sake or whisky, on circadian BP variation. Similarly, Ohira et al1 did not assess the influence of type of alcoholic beverage on circadian BP variation. Furthermore, the authors reported recently that long-term trends in the incidence of coronary heart disease and stroke and their risk factors differed between Ikawa and Yao.9 Although significant heterogeneity among regions was not found in the results of the present study,1 this might merely be attributable to the small number of subjects in each region. Therefore, further studies are needed to clarify the external validity of these findings in other areas and other countries. Moreover, follow-up of cardiovascular events in these subjects, as a single cohort as well as a candidate study for inclusion in the international database on ambulatory BP monitoring, would surely help to explore the possible reasons for inconsistency in the prognostic significance of morning BP surge on cardiovascular events.10

Sources of Funding

This work was supported by grants from the Ministry of Health, Labor, and Welfare, Japan; grants for scientific research from the Ministry of Education, Culture, Sports, Science, and Technology, Japan; Grant-in-Aid for Japan Society for the Promotion of Science Fellows; and Japan Atherosclerosis Prevention Fund.

Disclosures

None.


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Hypertension. 2009;53:4-5; originally published online November 24, 2008;
doi: 10.1161/HYPERTENSIONAHA.108.123018

Hypertension is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0194-911X. Online ISSN: 1524-4563

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World Wide Web at:
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