Triggering of sudden cardiac events by coffee and alcohol consumption: what do we know?

To the Editor: Now that heavy exertion (1,2), emotional stress (2,3), and meteorological factors (4,5) have been well-described as external triggers of sudden cardiac events, we have begun to look for further triggering circumstances. By using the case-crossover design (1,3), methodology that provided probably the most important information on the external triggering, the study by Šelb Šemerl and Šelb in 2004 December issue of the journal supported the link between coffee and alcohol consumption and the occurrence of sudden cardiac death (6). Despite some additional limitations that should be taken into consideration, the study raises several questions and brings new information about these two understudied but possible triggers.

The limitation of the case-crossover design is that it does not permit differentiation between a sudden death that would have occurred several hours later even without drinking coffee or alcohol, and one that would never have occurred had the patient avoided consumption during the 2-hour hazard period before the event. Greater association of the last consumption with sudden cardiac death in regular consumers of both drinks may at least in part result from the possibility that such persons, in the presence of severe and symptomatic cardiac disease, were more likely to take a cup of coffee or an alcoholic beverage to ease their unpleasant feeling, especially if this was their custom.

In assessing the triggering potential of coffee and alcohol consumption, it would be crucial to consider the possibility of multiple external triggering circumstances and to control for the exposure to more probable powerful triggers, like heavy exertion or anger, during the hazard period, which was not done in the present study. Furthermore, as stated in the article, the authors were not able to distinguish between types of medication used or to adjust for confounders due to the small number of consumers. Individual characteristics, particularly gender (2,7), and therapy with medicaments such as β-blockers, calcium-channel antagonists, aspirin, and nitrates, can significantly modify the susceptibility to specific triggers (1,3,7). The separation of protective effect of some of these drugs against coffee or alcohol consumption might be suggestive of the underlying triggering mechanisms and preventive opportunities.

One striking finding of the study is a higher relative risk of triggering sudden cardiac death by coffee or alcohol in those more frequently engaged in heavy exertion. This contradicts previous data on the protective effect of regular physical activity against other external triggers, with the frequency and intensity proportional to the benefit obtained (1-3). Therefore, regular physical activity is highly recommended for everyone but in coronary patients it should be accompanied by the cessation or at least moderation of coffee and alcohol drinking, and in particular by quitting smoking.

Clarification of diverse physiological effects of alcohol is in the interest of public health. In experimental studies, alcohol consumption increased the high-density lipoprotein cholesterol levels, decreased the levels of prothrombotic factors, reduced platelet aggregability, and suppressed the ischemia-induced arrhythmias. On the other hand, adverse effects of alcohol include lower exercise tolerance in patients with angina, dose-dependent coronary vasoconstriction, raised heart rate and systolic blood pressure, and increased levels of plasminogen activator inhibitor 1 (8,9). Therefore, although patients have to be reassured that every alcohol or coffee drink is not dangerous, caution regarding advice about consumption is required. For alcohol-containing beverages, moderate intake is confined to 1 to 2 drinks per day and is associated with reduced cardiovascular risk (8,9).

The risk of triggering sudden cardiac events by various external triggers appears to be highly individual, and more data, like those provided by Šelb Šemerl and Šelb, are needed to clarify the effects of specific types of beverages in a diverse population. Keeping in mind all possible benefits and a number of health hazards, the question of alcohol and coffee use should be carefully discussed between the patient and physician. At the moment, we still have much to learn about the mechanisms by which coffee and alcohol exert their pathological consequences in the presence of vulnerable plaques and damaged myocardium.

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References

1 Mittleman MA, Maclure M, Tofler GH, Sherwood JB, Goldberg RJ, Muller JE. Triggering of acute myocardial infarction by heavy physical exertion. Protection against triggering by regular exertion. Determinants of Myocardial Infarction Onset Study Investigators. N Engl J Med. 1993;329:1677-83.
2 Čulić V, Eterović D, Mirić D. Meta-analysis of possible external triggers of acute myocardial infarction. Int J Cardiol. In press 2005.
3 Mittleman MA, Maclure M, Sherwood JB, Mulry RP, Tofler GH, Jacobs SC, et al. Triggering of acute myocardial infarction onset by episodes of anger. Determinants of Myocardial Infarction Onset Study Investigators. Circulation. 1995;92:1720-5.
4 Čulić V, Mirić D, Eterović D. Different circumstances, timing, and symptom presentation at onset of Q-wave versus non-Q-wave acute myocardial infarction. Am J Cardiol. 2002;89:456-60.
5 Čulić V, Eterović D, Mirić D, Giunio L, Lukin A, Fabijanić D. Triggering of ventricular tachycardia by meteorologic and emotional stress: protective effect of beta-blockers and anxiolytics in men and elderly. Am J Epidemiol. 2004;160:1047-58.
6 Šelb Šemerl J, Šelb K. Coffee and alcohol consumption as triggering factors for sudden cardiac death: case-crossover study. Croat Med J. 2004;45:775-80.
7 Čulić V, Eterović D, Mirić D, Rumboldt Z, Hozo I. Gender differences in triggering of acute myocardial infarction. Am J Cardiol. 2000;85:753-6.
8 Mukamal KJ, Maclure M, Muller JE, Sherwood JB, Mittleman MA. Prior alcohol consumption and mortality following acute myocardial infarction. JAMA. 2001;285:1965-70.
9 Goldberg IJ, Mosca L, Piano MR, Fisher EA. AHA Science Advisory: Wine and your heart: a science advisory for healthcare professionals from the Nutrition Committee, Council on Epidemiology and Prevention, and Council on Cardiovascular Nursing of the American Heart Association. Circulation. 2001;103:472-5.

In Reply: We thank Dr Čulić for his comments on our article. We fully agree with them and are aware of deficiencies that occurred because we did not have large enough sample to exclude potential confounders. So we performed only univariate analysis. We also had some data on medications used and other potential triggers like physical activity of more than six metabolic equivalents grade, cigarette smoking, and reaction to dissatisfaction as proxy for anger or hostility. We showed that drinking coffee or alcohol, heavy physical activity or excitement, or certain level of anger increase the relative risk for triggering sudden cardiac death in exposed hours in persons with risk factors for ischemic heart disease or sudden cardiac death but we were not able to exclude simultaneous action of more than two factors. For more precise estimates of relative risks, we continue our research to identify more persons who died in risky time intervals. With more cases, we will also perform calculations to exclude potential confounding variables and perform multivariate analysis. Then we will also be able to clarify the contradiction about protective effect of physical activity. At this moment, we can only say that this contradiction could be the result of heavy physical activity performed at the same time as coffee or alcohol consumption in persons who are used to physical activity of described grade. In that case, the effects of both risk factors were added to each other.

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