Moderate Alcohol Intake, Though Not Regular Heavy Drinking, Is Protective for Acute Coronary Syndrome: A Population-Based, Case-Control Study in Southeast Europe

GENC BURAZERI, MD, PhD, AND JEREMY D. KARK, MD, PhD

PURPOSE: We assessed the association of alcohol drinking frequency and quantity with acute coronary syndrome (ACS) in a predominantly Muslim southeast European population, where heavy drinkers drink consistently.

METHODS: A population-based, case-control study conducted in 2003 through 2006 in Tirana, Albania, included 465 nonfatal sequential ACS patients aged 35 to 74 years (369 men, 96 women; 88% response) and a population-based control group (450 men and 235 women aged 35–74 years; 65.5% response). A structured interview included sociodemographic, psychosocial, and behavioral characteristics. Anthropometric measurements were performed. Statistical analysis employed multivariable-adjusted logistic regression.

RESULTS: Women abstained or were light drinkers. Among men, there was a protective association of ACS with both frequency of intake [multivariable-adjusted odds ratio (OR; almost daily versus occasional drinkers), 0.3; 95% confidence interval (CI), 0.2–0.5] and "moderate" drinking quantities [OR (100–299 versus <10 g/wk), 0.4; 95% CI, 0.2–0.6]. Heavy drinking (≥300 g/wk; ≈10% of men) was regular rather than episodic, and was associated with loss of protection.

CONCLUSIONS: Among the men in this transitional Mediterranean population, we found a strong protective effect associated with both moderate frequency and quantity of intake. The unique context of our study reinforces the case for causality in the relationship between moderate alcohol intake and coronary health.

Ann Epidemiol 2011;21:564–571. © 2011 Elsevier Inc. All rights reserved.

KEY WORDS: Acute Coronary Syndrome, Albania, Alcohol Drinking Frequency, Alcohol Drinking Patterns, Alcohol Drinking Quantity, Coronary Heart Disease, Muslim, Religion, Religiosity, Southeast Europe, Transitional Post-Communist Society.

INTRODUCTION

Heavy alcohol consumption has been related to increased risk of cardiovascular disease (CVD) (1–3), whereas moderate alcohol intake has been consistently associated with a cardioprotective effect (1, 2, 4–6). Among men, drinking frequency has been suggested to account for the inverse association between alcohol intake and coronary heart disease (CHD) (7, 8), whereas among women the amount of alcohol consumed may be more important than frequency (7). In light of events in the Soviet Union in the 1980s, however, conventional wisdom about the cardioprotective effects of alcohol consumption has been questioned (9, 10). In Russia and in the Baltic countries, there is convincing evidence of a strong positive association between alcohol consumption and CVD death (10–13). In these countries, the total amount of alcohol consumed and especially the drinking style may have an important impact on the occurrence of sudden cardiac events in young and middle-aged men (10–13). In a recent meta-analysis, Bagnardi et al. (14) concluded that heavy irregular drinkers, but not heavy regular drinkers, were at excess CVD risk.

Observational studies of the association of alcohol intake with CHD may have been marred by confounding and inferring causality from the protective association of moderate intake is uncertain (15). Consistency in diverse populations with differing confounding structures can enhance causal inference.

Albania, a poor country in Southeast Europe, emerged in 1990 from a most rigid communist regime (16, 17). The transition toward a market-oriented system was accompanied by a decade of massive unemployment, poverty, and emigration (18) and an increase in unhealthy behaviors (16, 17). According to official statistics [which are said to considerably underestimate intake (19)] alcohol consumption

From the Department of International Health, School for Public Health and Primary Care (CAPHRI), Faculty of Health, Medicine and Life Sciences (G.B.), Maastricht University, The Netherlands; Department of Public Health, Faculty of Medicine (G.B.), Tirana, Albania; and Hebrew University–Hadassah School of Public Health and Community Medicine (J.D.K.), Ein Kerem, Jerusalem, Israel.

Address correspondence to: Genc Burazeri, MD, PhD, Department of International Health, School for Public Health and Primary Care (CAPHRI), Faculty of Health, Medicine and Life Sciences, Maastricht University, Universiteitssingel 40, 6229 ER Maastricht, The Netherlands. Tel.: +31647409194. E-mail: Genc.Burazeri@INTHEALTH.unimaas.nl.

Received September 14, 2010; accepted February 22, 2011.

Selected Abbreviations and Acronyms

ACS = acute coronary syndrome
CI = confidence interval
CHD = coronary heart disease
CVD = cardiovascular disease
OR = odds ratio

(largely *raki*, a Vodka-like spirit) ranks among the lowest in the World Health Organization's European region (20). CHD mortality and morbidity seem to have increased over the past decade in Albania (21, 22).

In this transitional context experienced by a predominantly secular although largely Muslim Mediterranean population, we assessed the association of alcohol drinking frequency and quantity with acute coronary syndrome (ACS) among residents of Tirana, the Albanian capital, where heavy drinkers mostly drink consistently, rather than in irregular bouts of binging (23, 24).

METHODS

Study Population

A population-based, case-control study among 35- to 74-year-old male and female Tirana residents was conducted from 2003 to 2006 (25). We recruited 467 consecutive nonfatal ACS patients admitted to the University Hospital Centre, the only hospital in Tirana (370 men, 97 women; 301 first events, 166 repeat events). The definition of ACS was based on combinations of clinical signs and symptoms, electrocardiographic and echocardiographic criteria, and elevated cardiac enzymes (25).

The population-based sample comprised an age- and gender-stratified random sample drawn from the adult population of the Tirana municipality, as registered in the Albanian census of April 2001. We sampled 180 men and 120 women in each of four age groups: 35 to 44, 45 to 54, 55 to 64, and 65 to 74 years, yielding a total of 1200 participants (720 men and 480 women). Of the estimated 1046 subjects (644 men and 402 women) who met the eligibility criteria [individuals who (i) were alive; (ii) did not report a prior acute myocardial infarction; (iii) were not bed bound; (iv) had not emigrated before the start of the study; and (v) nonpregnant women who had not delivered within 6 months of entry to the study], 737 individuals who were recruited by home visits participated in the study (469 men, 268 women) (25). Male control nonrespondents were moderately older than respondents and were significantly more likely to be retired, but were similar in regard to religion (Muslim or Christian) and educational level. The female nonrespondents did not differ from the respondents with regard to these variables.

We included the 465 ACS patients (369 men, 96 women; 88% response) and 685 controls [450 men, 235 women; 65.5% estimated response rate after conservative correction for ineligibility among individuals not contacted (23)] who provided data on alcohol intake.

Data Collection

A structured questionnaire, including sociodemographic and psychosocial characteristics and CHD risk factors, was administered to case and control participants at the University Hospital Centre. The physical examination included measurement of weight, height, waist and hip circumferences, and a 12-lead electrocardiograph [the latter only in the controls (25)]. The ACS patients were interviewed and examined generally within 1 week of admission.

Measures of alcohol consumption included the frequency of alcohol use in the past 12 months [never, occasional, 1–2 times/month, 1–2 times/week, almost daily, and ≥2 times per day (24, 26)]; the number of units each of spirits, wine and beer consumed in an average week (24, 27) (standard units of intake in Albania were taken as 50, 200, and 500 mL, respectively, almost double those in some countries, and standard alcohol content (by volume) was 5%, 12.5% and 50%, respectively); and assessment of drinking patterns [units of each beverage consumed in a single drinking session (adapted from ref. 26), average drinking session duration, and frequency of drunkenness and hangovers (23)].

The covariates included in the analysis were previously found to be independently associated with ACS in this study population: (i) Conventional coronary risk factors (25)—self-reported current smoking, self-reported hypertension and diabetes, self-reported leisure time exercise (28, 29), measured body mass index, and waist-to-hip ratio (25); (ii) socioeconomic characteristics and psychosocial factors (all self-reported)—education, employment status, relative income (18), social position and social mobility (18, 30), financial loss in the pyramid schemes (30), emigration of close relatives (18), religious affiliation (31), and religious observance (32).

Evidence of previous CHD in the case group was determined by questionnaire-based criteria [past history of angina pectoris and acute myocardial infarction and the Rose questionnaires (33, 34) as well as hospital documentation of past ACS] and determination of prevalence cases of CHD among the controls using the same questionnaire-based criteria as well as electrocardiographic evidence.

Questionnaire-based information was obtained on preexisting diabetes, hypertension, and stroke (all diagnosed by a doctor) and congestive heart failure (7 items).

The study was approved by the Albanian Committee of Medical Ethics. Participants gave written consent after being informed about the aims and procedures of the study.