Fraction of Fatal Accidents Attributable to Alcohol in Russia

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Abstract

There is common believe that high level of alcohol consumption in conjunction with binge drinking pattern is a major determinant of accident mortality crisis in Russia. Objective: The aim of the present study was to estimate the fraction of accident mortality attributable to alcohol in Russia using aggregate-level data. Method: Age-standardized sex-specific male and female accident mortality data for the period 1970-2010 and data on overall alcohol consumption were analyzed by means ARIMA (autoregressive integrated moving average) time series analysis. Alcohol consumption was significantly associated with both male and female accident mortality rates: a 1 liter increase in overall alcohol consumption would result in a 7.3% increase in the male accident mortality rate and in 6.2% increase in the female mortality rate. The results of the analysis suggest that 62.4% of all male accident deaths and 56.4% female deaths in Russia could be attributed to alcohol. Conclusions: The outcomes of this study provide support for the hypothesis that alcohol is an important contributor to the accident mortality rate in Russian Federation. The findings from the present study have important implications as regards accident mortality prevention indicating that a restrictive alcohol policy can be considered as an effective measure of prevention in countries where higher rate of alcohol consumption conjunct with binge drinking pattern.

Keywords: Accidents; Mortality; Alcohol consumption; ARIMA time series analysis; Russia 1970-2010

Introduction

Accidents and injuries are among the leading cause of death and disability in many countries [1]. Alcohol is the major risk factor for fatal accidents and injuries, contributing to approximately one third of all deaths [2-4]. A causal link between alcohol and injuries has been established from both individual and population level studies [1,5-8]. A systematic review of emergency department studies, published between 1995 and 2005, revealed that injured patients were more likely to be positive for BAC (blood alcohol concentration) at the time they were admitted and to report drinking within six hours prior to the injury event compared with those who were not reporting with injuries [1]. Of all alcohol-attributable deaths globally, WHO indentify 12% as being a result of intentional injuries and 29.6% being a result of unintentional injuries [9]. There is a dose-response relationship between alcohol and injury, with risk increasing with an increasing amount of alcohol consumed [4]. Alcohol-related accidents and injuries are more closely related to pattern of drinking than to the overall volume consumed [5,10-13].

Accidents and violence have been indentified as the largest contributors to alcohol-related excess deaths in Russia [14-16]. Accumulated research evidence also suggests that the combination of high overall level of alcohol consumption with the binge drinking pattern of strong spirits (vodka) is responsible for Russian's high and sharply fluctuating accident death rates [17-20]. A large retrospective case-control study in three Russian industrial cities found dose-response association between alcohol consumption and mortality from accidents: drinking of three or more bottles of vodka per week was strongly associated with accidents deaths both among men (RR= 6.07; CI: 5.27-6.98) and women (RR= 8.56; CI: 7.0110.45) [21].

In present study we will test the hypothesis of the close aggregate level link between alcohol and accident mortality in Russia using data on overall alcohol consumption and sex-specific accident mortality rate between 1970 and 2010.

Material and Methods

Data

The data on sex-specific accident mortality rate per 1000.000 of residents combining several categories of death (Table 1) were taken from the Russian vital statistics registration system. The Rosstat's cause of death classification has undergone several changes in recent decades. Until 1988 the cause of death classification was based upon the Soviet nomenclature which had a limited number of causes of death in comparison with the International Classification of Diseases (ICD) system. From 1989-1998 Rosstat used a coding scheme that was based on ICD-9. From 1999 a new coding system based on ICD-10 was introduced. The Russian coding system is claimed to be compatible with ICD-9 and ICD-10 [22,23].

Causes of death	ICD 10 code
Falls	W00-W19
Exposure to inanimate mechanical forces	W20-W49
Exposure to animate mechanical forces	W50-W64
Accidental drowning and submersion	W65-W74
Other accidental threats to breathing	W75-W84
Exposure to electric current, radiation and extreme ambient air temperature and pressure	W85-W99

Exposure to smoke, fire and flames	X00-X09
Contact with heat and hot substances	X10-X19
Contact with venomous animals and plants	X20-X29
Exposure to forces of nature	X30-X39
Accidental poisoning by and exposure to noxious substances	X40-X49

Overexertion, travel 0ıє

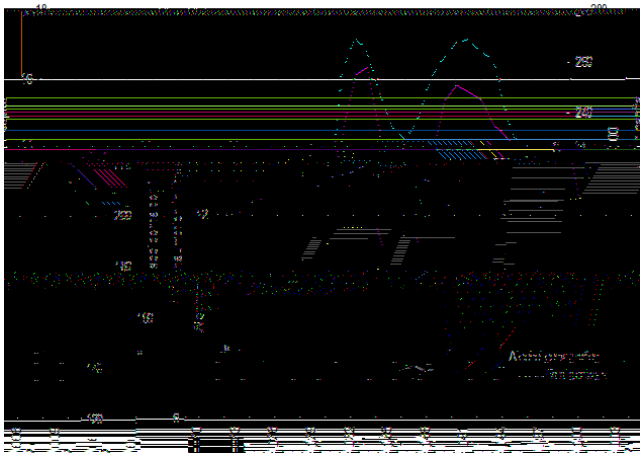

Figure 2: Trends in female accident mortality rate and alcohol consumption per capita in Russia between 1970 and 2010.

Discussion

The outcome of the time-series analysis suggests a positive and statistically significant relationship between accident mortality rate and population drinking in Russia. Therefore, the contemporaneous association between the two variables may support the point that binge drinking is an important determinant of accident mortality in Russia. In an international comparison, Russia stood out with an alcohol effect that was larger than what had previously been estimated for the Western Europe [7].

In agreement with previous studies, we have found the gender differences in the association between per capita alcohol consumption and accident mortality rate, which mean that the impact of changes in per capita alcohol consumption appear to be larger on male accident mortality [7]. The harmful drinking might be responsible for the gender differences in alcohol attributable deaths. The population surveys from Russia show consistently higher rates of binge drinking among men than women. Indeed, the results of study carried out in Archangelsk suggest that 61.9% of male and 25.7% of female industrial workers had a consumption pattern that was hazardous according to the AUDIT definition [28].

It is likely that a combination of factors such as what is consumed and how it is consumed underlies the high accident mortality rate recorded in Russia [23]. Elucidating the phenomenon of high accident mortality rate in Russia, however, does little to understand the reasons

References

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