Correlates of Hypertension Among Adult Men and Women in Kosovo

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ABSTRACT

Aim: We aimed to assess the independent socioeconomic, behavioral and psychosocial correlates of hypertension among the adult population of Kosovo. **Methods:** This was a cross-sectional study carried out in Pristina in 2012-2013 which included a large representative sample of 1793 consecutive primary health care users aged ≥35 years (mean age: 51.2±6.7 years; 52.5% women; overall response: 95%). Systolic and diastolic blood pressure was measured, whereas demographic and socioeconomic characteristics (age, sex, marital status, place of residence, education, employment status and income), lifestyle factors (smoking, alcohol intake, physical exercise and dietary fat intake) and psychosocial factors (hostility and reaction to transition) were assessed through a structured questionnaire. Multivariable-adjusted binary logistic regression was used to assess the independent "predictors" of hypertension. **Results:** Upon simultaneous adjustment in a backward stepwise elimination procedure for all socioeconomic characteristics, lifestyle factors and psychosocial factors, significant positive correlates of hypertension were older age (OR=1.03, 95%CI=1.01-1.05), male gender (OR=1.41, 95%CI=1.19-1.58), a lower educational attainment (OR=1.36, 95%CI=1.08-1.67), smoking (OR=1.53, 95%CI=1.28-2.16), physical inactivity (OR=1.98, 95%CI=1.46-2.74) and hostility (OR=1.42, 95%CI=1.17-2.08). **Conclusions:** Findings from this study conducted in transitional Kosovo are generally in line with previous reports from the Western Balkan countries and beyond. Decision-makers and policymakers should be aware of the rising trend and socioeconomic, behavioral and psychosocial determinants of hypertension in post-war Kosovo.
Key words: behavioral factors, blood pressure, hypertension, Kosovo, lifestyle factors, physical activity, Pristina, psychosocial factors, smoking, Western Balkans.

1. INTRODUCTION

There is a considerable evidence linking hypertension with cardiovascular morbidity and mortality worldwide (1-3). As a matter of fact, hypertension is currently one of the leading global risks for mortality, and was responsible for 9.4 million deaths in the year 2010 (4). In transitional countries of South Eastern Europe, it is also well-documented that hypertension is an important risk factor for coronary heart disease, a finding which has been also confirmed by the Global Burden of Disease Study update for 2010 (1). The available evidence from Albanian settings is also in line with the trends observed in the other countries of the Western Balkans and beyond. Hence, previous reports from Albania have linked hypertension with an increased risk of acute coronary syndrome (5) and diabetes (6) in the adult men and women in this transitional society, which was the most isolated former communist country in Europe. On the other hand, Kosovo is the newest state in Europe, which is struggling to establish a functional democracy after a long and devastating war with Serbia. In Kosovo, another predominantly Albanian population in the Western Balkans, mortality trends of chronic diseases including cardiovascular diseases appear to be similar to the adult mortality trends and life expectancy in both sexes

(7,8). In particular, stroke mortality in Kosovo is substantially higher than in the European Union member states – regardless of the lack of well-documented scientific reports on this matter (7,8). Nevertheless, data on the magnitude and determinants of hypertension in the adult population of Kosovo are scant, to date. We have previously reported on the prevalence of hypertension in a representative sample of adult primary health care users of both sexes in Kosovo (7). Furthermore, we have reported on selected demographic, socioeconomic and behavioral correlates of hypertension in this study population (7,8). In this article we expand our analysis including also selected important psychosocial factors such as reaction toward political and socioeconomic transition in post-war Kosovo and hostility (alias cynical distrust), which has been convincingly related to cardiovascular morbidity and mortality in different international studies (9-11).

2. METHODS

This was a cross-sectional study which was carried out in Pristina, the capital city of Kosovo, in 2012-2013.

2.1. Study population and sampling

A sample of 2000 consecutive primary health care users aged ≥35

years was invited to participate in the study. Calculation of the sample size was made by use of WINPEPI (Program for Epidemiologists) for several hypotheses related to the prevalence and socioeconomic, behavioral and psychosocial correlates of hypertension in the adult population of Kosovo (7,8). The significance level (two-tailed) was set at 5%, and the power of the study at 80%. Based on the most conservative calculations, the required minimal size for a simple random sample was about 1700 individuals. We decided to recruit 2000 individuals in order to account for non-response. Of the 2000 targeted individuals, 207 did not participate in the study (113 individuals were not eligible, whereas further 94 individuals refused to participate). Overall, 1793 primary health care users were included in this study (response rate: 1793/1887=95%) (7,8). The response rate was similar in men and women.

2.2. Data collection

All study participants underwent measurement of their systolic and diastolic blood pressure (7,8). Such a measurement was performed with an electronic sphygmomanometer three times in the right arm (with a one-minute pause in between), after the individual was seated for five minutes in a quiet room, during which the cuff was attached. Mean value of the 2nd and the 3rd measurements was used in the analysis. Hypertension was defined as systolic blood pressure ≥140 mmHg, or diastolic blood pressure ≥90 mmHg, or self-reported treatment for hypertension regardless of the measurement values (7,8). Demographic factors included sex (men vs. women), age (in years), place of residence (urban vs. rural area) and marital status (married vs. single/divorced/widowed). Socioeconomic characteristics included educational attainment (0-8 years vs. ≥9 years), employment status (employed, unemployed, retired) and income level (low, middle, high) (7). Lifestyle/behavioral factors consisted of smoking status (current and/or past smokers vs. no smokers), alcohol intake (dichotomized in the analysis into: excessive alcohol intake vs. no/low/moderate intake), physical activity (trichotomized into: low, moderate and high) and dietary fat intake (trichotomized in the analysis into: low, moderate and high) [8].

Psychosocial factors included hostility and reaction to transition. Hostility was measured by an 8-item Cynical Distrust Scale based on which a summary score was calculated for each study participant (12). In the analysis, hostility score was dichotomized into: non-hostile (below median score) vs. hostile (above median score). Reaction to political and socioeconomic transition consisted of a composite score of three items capturing attitudes toward political and socioeconomic aspects of transition in post-war Kosovo (13). In the analysis, reaction to transition was trichotomized into: optimistic, neutral and pessimistic attitude. The survey was approved by the Kosovo Board of Biomedical Ethics. All individuals who agreed to participate in the study gave their informed consent.

2.3. Statistical analysis

Binary logistic regression was used to assess the association of hypertension (outcome variable) with independent variables namely demographic and socioeconomic characteristics (age, sex, marital status, place of residence, education, employment status and income), lifestyle/behavioral factors (smoking, alcohol intake, physical exercise and dietary fat intake) and psychosocial factors (hostility and reaction to transition). All correlates (independent variables) were entered into the logistic models and removed in a backward stepwise procedure if their p-value exceeded 0.10. Multivariable-adjusted odds ratios (ORs), their 95% confidence intervals (CIs) and p-values were calculated. Hosmer-Lemeshow test was used to assess the goodness of fit of the logistic regression models. Statistical Package for Social Sciences, version 17.0, Chicago, Illinois, was used for all the statistical analyses.

3. RESULTS

Mean age in this representative sample of adults (52.5% women) who attended primary health care services in Kosovo was 51.2±6.7 years. About 57% of survey participants were urban residents and 86% were currently married. Unemployment level was high (33%), an indication of the considerable proportion of a self-reported lower income level (39%) [7]. The overall prevalence of hypertension was about 34% (39% in men vs. 29% in women) [7,8]. Table 1 presents the multivariable-adjusted association of hypertension with demographic and socioeconomic characteristics, lifestyle/behavioral factors and psychosocial factors. Upon simultaneous adjustment in a backward

Variable	OR (95%CI)*	P*
Age (years)	1.03 (1.01-1.05)	0.02
Sex:		
Women	1.00 (reference)	0.01
Men	1.41 (1.19-1.58)	
Place of residence:		
Urban area		
Rural area		
Marital status:		
Married		
Single/divorced/widowed		
Educational level:		
≥9 years	1.00 (reference)	0.04
0-8 years	1.36 (1.08-1.67)	
Employment status:		
Employed		
Unemployed		
Retired		
Income level:		
High		
Middle		
Low		
Present or past smoker:		
No	1.00 (reference)	0.01
Yes	1.53 (1.28-2.16)	
Excessive alcohol intake:		
No		
Yes		
Physical activity:		**<0.01 (2)†**
High	1.00 (reference)	-
Moderate	1.27 (0.95-1.78)	0.13
Low	1.98 (1.46-2.74)	<0.01
Fat intake:		
Low		
Moderate		
High		
Hostility:		
Non-hostile	1.00 (reference)	0.01
Hostile	1.42 (1.17-2.08)	
Reaction to transition:		
Optimistic		
Neutral		
Pessimistic		

*Table 1. Association of hypertension with demographic and socioeconomic characteristics, behavioral factors and psychosocial factors in a representative sample of adult primary health care users in Kosovo (N=1793), in 2012-2013 *Multivariable-adjusted odds ratios (ORs: hypertension vs. no hypertension), 95% confidence intervals (95%CI) and p-values from binary logistic regression. All the variables presented in the table were included in a backward stepwise elimination procedure with a p-value to exit set at >0.10. Empty cells refer to the variables excluded from the logistic models..† Overall p-value and degrees of freedom (in parentheses).*

stepwise elimination procedure for all socioeconomic characteristics, lifestyle factors and psychosocial factors, significant positive correlates of hypertension were older age (OR=1.03, 95%CI=1.01-1.05), male gender (OR=1.41, 95%CI=1.19-1.58), a lower educational attainment (OR=1.36, 95%CI=1.08-1.67), smoking (OR=1.53, 95%CI=1.28-2.16), physical inactivity (OR=1.98, 95%CI=1.46-2.74) and hostility (OR=1.42, 95%CI=1.17-2.08). The association with hostility was stronger in men than in women (p-value for hostility-sex interaction: 0.04) [not shown in the table].

4. DISCUSSION

Main findings of our analysis including a large representative sample of adult men and women who were users of primary health care services in Kosovo consist of a strong positive association between hypertension and several important behavioral/lifestyle and psychosocial factors including cigarette smoking, physical inactivity and hostility (cynical distrust). Hence, smoking, lack of physical and hostility were important and significant correlates of hypertension in multivariable-adjusted models accounting for a wide range of demographic and socioeconomic characteristics (age, sex, marital status, residence, education, employment, income), other lifestyle factors (alcohol and fat consumption) and other psychosocial factors (reaction to transition). In addition, our analysis confirmed age, male gender and a lower educational attainment as important and significant socio-demographic determinants of hypertension also in this post-war society. The strongest independent "predictor" of hypertension in our study was physical inactivity. This finding is consistent with previous studies conducted in Albania which have also reported a positive association between lack of physical exercise with acute coronary syndrome (14) and diabetes (15).

Similarly, the positive association between smoking and hypertension in our study is compatible with a previous report from Albania which has linked cigarette smoking to an excess risk for acute coronary syndrome (5). An interesting finding of our study consisted of a positive and significant association between hostility and hypertension, which was particularly evident in men. As a matter of fact, this finding is in line with a previous population-based case-control study conducted in Albania which has reported a positive independent relationship between cynical distrust and acute coronary syndrome (12). Our findings suggest a deleterious effect of hostility on hypertension which may be highlighted by the difficult circumstances present in the context of post-war Kosovo. On the other hand, upon multivariable-adjustment for all covariates including hostility, we did not find a significant association between hypertension and reaction to political and socioeconomic transition, contrary to a previous report from the neighboring Albania (13). There is considerable evidence from the international literature pointing to high blood pressure as a significant risk factor for ischemic heart disease and stroke (1-4). In particular, there have been reliable reports indicating that hypertension is the most important risk factor for mortality due its dominant role in cardiovascular pathogenesis (3,4). We have previously argued (8) that there are serious implications for transitional countries of the Western Balkans such as Albania and Kosovo given the rapid pace of transition and its inherent association with hypertension (5), including also the reduced energy expenditure and the consequent obesity (6). All these factors bear important implications for both the health care and health promotion sectors in transitional countries of the Western Balkans (5,6,8).

Our study may have some limitations including the sample representativeness (pointing to selection bias) and potential information biases, especially for assessment of lifestyle/behavioral factors and psychosocial factors which were based on self-reported data. Inclusion in our study of a large sample of adult men and women who were consecutive primary health care users with a very high response rate provides reassurance for absence of selection bias. Furthermore, measurement of systolic and diastolic blood pressure was all based on standard procedures in all study participants (6). In any case, as pointed above, the information on demographic and socioeconomic characteristics, lifestyle/behavioral factors and psychosocial factors was based on self-reports. Therefore, we cannot exclude completely the possibility of differential reporting of the behavioral and psychosocial factors between different groups of individuals characterized by the presence of hypertension. Finally, associations from cross-sectional studies are not considered to be causal. From this perspective, future prospective studies in Kosovo and other Western Balkan countries should confirm findings of our cross-sectional study.

5. CONCLUSION

Our study provides useful evidence on selected important determinants of hypertension in the adult population of post-war Kosovo. Decision-makers and policymakers should be aware of the rising trend and socioeconomic, behavioral and psychosocial determinants of hypertension in post-war Kosovo.

CONFLICT OF INTEREST: NONE DECLARED

REFERENCES

1. Lim SS, Vos T, Flaxman AD, Danaei G, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2012;15:380: 2224-2260.
2. Global Burden of Disease Study 2010. Available at: http://www.thelancet.com/themed/global-burden-of-disease (accessed: June 2014).
3. World Health Report. Reducing risks, promoting healthy life. 2002. Available at: www.who.int/whr/eng.
4. Kintscher U. The burden of hypertension. Euro Intervention. 2013; 9 Suppl R: R12-5.
5. Burazeri G, Goda A, Sulo G, Stefa J, Roshi E, Kark JD. Conventional risk factors and acute coronary syndrome during a period of socioeconomic transition: population-based case-control study in Tirana, Albania. Croat Med J. 2007; 48: 225-233.
6. Shapo L, Pomerleau J, McKee M. Epidemiology of hypertension and associated cardiovascular risk factors in a country in transition: a population-based survey in Tirana city, Albania. J Epidemiol Community Health. 2003; 57: 734-739.
7. Hashani V, Hyska J, Roshi E. Socioeconomic determinants of hypertension in the adult population of transitional Kosovo. Alban Med J. 2013; 2: 41-45.
8. Hashani V, Hyska J, Qirjako G, Roshi E. Lifestyle predictors of hypertension in the adult population of post-war Kosovo. Alban Med J. 2013; 3: 74-79.
9. Everson SA, Kauhanen J, Kaplan GA, et al. Hostility and increased risk of mortality and acute myocardial infarction: the mediating role of behavioral risk factors. Am J Epidemiol. 1997;146:142-152.
10. Bunde J, Suls J. A quantitative analysis of the relationship between the Cook-Medley Hostility Scale and traditional coronary artery disease risk factors. Health Psychol. 2006; 25: 493-500.
11. Everson-Rose SA, Lewis TT. Psychosocial factors and cardiovascular diseases. Annu Rev Public Health. 2005; 26: 469-500.
12. Burazeri G, Kark JD. Hostility and acute coronary syndrome in a transitional post-communist Muslim country: a population-based study in Tirana, Albania. Eur J Public Health. 2011; 21: 469-476.
13. Burazeri G, Kark JD. Negative attitudes to transition in post-communist Albania and acute coronary syndrome. Health Psychol. 2009; 28: 779-786.
14. Burazeri G, Goda A, Kark JD. Television viewing, leisure-time exercise and acute coronary syndrome in transitional Albania. Prev Med. 2008; 47: 112-115.
15. Shapo L, Pomerleau J, McKee M. Physical inactivity in a country in transition: A population-based survey in Tirana City, Albania. Scand J Public Health. 2004; 32: 60-67.