

Socioeconomic determinants of hypertension in the adult population of transitional Kosovo

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Abstract

Aim: Hypertension is an important risk factor for cardiovascular disease including the transitional countries of the Western Balkans. Our aim was to assess the prevalence and socioeconomic determinants of hypertension in the adult population of post-war Kosovo.

Methods: A cross-sectional study was conducted in Pristina in 2012-2013 including a representative sample of 1793 consecutive primary health care users aged ≥ 35 years (mean age: 51.2 ± 6.7 years; 52.5% women; overall response rate: 95%). All participants were measured their systolic and diastolic blood pressure. Information on demographic factors and socioeconomic characteristics was also collected. Binary logistic regression was used to assess the association of hypertension with demographic and socioeconomic characteristics.

Results: Overall, the prevalence of hypertension was 33.6% (38.9% in men vs. 28.8% in women). In unadjusted logistic models, there was evidence of a positive and significant association of hypertension with male gender, urban residence, unmarried civil status, unemployment and retirement, and a lower income level. Upon multivariable-adjustment, significant "predictors" of hypertension were male gender, unemployment, and a lower income level.

Conclusions: Our findings indicate a relatively high prevalence of hypertension in the adult population of post-war Kosovo, especially among men and the most disadvantaged socioeconomic groups. Health care professionals and policymakers in Kosovo should be aware of the high burden of morbidity and mortality-related outcomes associated with hypertension.

Keywords: diastolic blood pressure, high blood pressure, hypertension, Kosovo, systolic blood pressure.

Introduction

Kosovo is currently undergoing a rapid process of transformation to an independent state after the war and the liberation from the Serbian regime in 1999 and almost a decade under United Nations administration. The independence of Kosovo was formally declared in 2008, hence constituting the newest state in Europe. Kosovo has the youngest European population, as evidenced in the Demographic, Social and Reproductive Health Survey conducted in 2009 (1). However, Kosovo is one of the poorest countries in Europe, with a large proportion of the population living below the national poverty line – according to recent estimates from the World Bank (2). Similar data on the poverty levels of Kosovo population are also supported by the International Labor Organization (3). In Kosovo, mortality trends of chronic diseases including cardiovascular diseases resemble adult mortality trends and life expectancy in both sexes. In particular, regardless of the absence of official reports, stroke mortality in Kosovo is considerably higher than in the European Union member states, a situation which is similar to many countries in the Western Balkans. Therefore, changes in cardiovascular disease mortality account for the apparent changes in the overall mortality patterns in post-war Kosovo. However, according to the Household Budget Survey conducted in Kosovo in 2011, the prevalence of smoking in the population of Kosovo aged ≥ 15 years (13.0% in the overall population) is lower than in other countries of the Western Balkans (4).

Hypertension is a well-established risk factor for cardiovascular morbidity and mortality in both sexes. This was well-documented and confirmed by the Global Burden of Disease Study update for 2000 (5), and the fairly recent update for 2010 (6,7). Arterial hypertension is among the leading global risks for mortality, being responsible for 9.4 million deaths in 2010 (8). This considerable burden linked to hypertension has been documented in many studies (7). Increased blood pressure contributes to cardiovascular and cerebrovascular endpoints, such as myocardial infarction, heart failure, cardiovascular death and stroke (8).

However, data on the prevalence and correlates of hypertension in the adult population of Kosovo are

scarce. In this context, our aim was to assess the prevalence and socioeconomic determinants of hypertension in the adult population of Kosovo, a transitional country in the Western Balkans undergoing rapid changes after a decade of war with Serbia.

Methods

A cross-sectional study was conducted in Pristina, the capital city of Kosovo, in 2012-2013.

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 a number of hypotheses related to the prevalence and socioeconomic correlates of hypertension such as sex, age, level of education and employment status. 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 our study (response rate: $1793/1887=95\%$). The response rate was similar in men and women.

Data collection

All participants were measured their systolic and diastolic blood pressure. Measurement of blood pressure was done with an electronic sphygmomanometer three times in the right arm (with a one-minute pause in between), after the subject was seated for five minutes in a quiet room, during which the cuff was attached. The average 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.

Data on socio-demographic factors (sex, age, place of residence [urban vs. rural area] and marital status

[married vs. single/ divorced/ widowed]) and socioeconomic characteristics (educational level [low, middle, high], employment status [employed, unemployed, pension] and income level [low, middle, high]) were also collected.

The survey was approved by the Kosovo Board of Biomedical Ethics. All individuals who agreed to participate in the study gave their informed consent.

Statistical analysis

Binary logistic regression was used to assess the association of hypertension (dichotomous/ binary variable) with socio-demographic and socioeconomic characteristics (age, sex, place of residence, education level, employment status and income level). Crude/ unadjusted odds ratios (ORs) and their respective 95% confidence intervals

(95% CIs) were initially calculated. Subsequently, multivariable-adjusted ORs and their respective 95% CIs 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.

Results

Mean age of study participants was 51.2 ± 6.7 years (Table 1). There were 851 (47.5%) men and 942 (52.5%) women in the study sample. Overall, about 57% of survey participants were urban residents and 86% were currently married. Unemployment rate was relatively high in this sample (33%), which was also reflected in a high proportion of self-reported low income level (39%).

Table 1. Distribution of demographic and socioeconomic characteristics in a large representative sample of adult men and women in Kosovo (N=1793) in 2012-2013

Demographic and socioeconomic factors	Distribution
Age (years)	51.2±6.7*
Educational level (years)	8.76±3.49*
Sex:	
Men	851 (47.5)†
Women	942 (52.5)
Place of residence	
Urban area	1019 (56.8)†
Rural area	774 (43.2)
Marital status:	
Married	1539 (85.8)†
Single/divorced/widowed	254 (14.2)
Employment status:	
Employed	763 (42.5)†
Unemployed	591 (33.0)
Pension	439 (24.5)
Income level:	
High	267 (14.9)†
Middle	826 (46.1)
Low	700 (39.0)

* Mean values ± standard deviations.

† Numbers and column percentages (in parentheses).

Overall, 602 participants were hypertensive and, therefore, the prevalence of hypertension was 602/1793=33.6%. The prevalence of hypertension was higher in men (331, or 38.9%) than in women (271, or 28.8%).

Table 2 presents the crude/ unadjusted association of hypertension with demographic factors and

socioeconomic characteristics. There was evidence of a positive and significant association of hypertension with male gender (OR=1.36, 95%CI=1.18-1.57), urban residence (OR=2.14, 95%CI=1.74-2.51), unmarried civil status (OR=1.63, 95%CI=1.12-2.04), unemployment (OR=2.28, 95%CI=1.79-3.01) and retirement (OR=3.41,

95%CI=2.06-4.13), and a lower income level (OR=2.34, 95%CI=1.60-3.27).

Upon multivariable-adjustment, significant “predictors” of hypertension were male gender (OR=1.27, 95%CI=1.12-1.43), unemployment

(OR=1.72, 95%CI=1.34-2.86), and a lower income level (OR=1.89, 95%CI=1.39-2.81) [data not shown in the tables].

Discussion

The main findings of our study include a relatively

Table 2. Association of hypertension with demographic factors and socioeconomic characteristics in a large representative sample of adult population in Kosovo (N=1793) in 2012-2013

Variable	OR (95%CI)*	P*
Age (years)	1.02 (1.01-1.03)	0.03
Educational level (years)	1.01 (0.98-1.03)	0.49
Sex:		
Women	1.00 (reference)	0.02
Men	1.36 (1.18-1.57)	
Place of residence		
Urban area	1.00 (reference)	0.01
Rural area	2.14 (1.74-2.51)	
Marital status:		
Married	1.00 (reference)	0.04
Single/divorced/widowed	1.63 (1.12-2.04)	
Employment status:		<0.01 (2) [†]
Employed	1.00 (reference)	-
Unemployed	2.28 (1.79-3.01)	0.01
Pension	3.41 (2.06-4.13)	<0.01
Income level:		0.04 (2)[†]
High	1.00 (reference)	-
Middle	1.29 (0.83-1.92)	0.27
Low	2.34 (1.60-3.27)	0.01

* Odds ratios (ORs), 95% confidence intervals (95%CI) and p-values from binary logistic regression.

[†] Overall p-value and degrees of freedom (in parentheses).

high prevalence of hypertension in the adult population of Kosovo, which raises serious concerns for health care professionals and decision makers in the health sector. The prevalence of hypertension was considerably high particularly among men and the most vulnerable socioeconomic segments of the population (the unemployed and the low-income groups).

The prevalence of hypertension in our study was higher compared with a prior report from Albania (9). On the other hand, there are very few scientific articles addressing the issue of hypertension in the adult population of Kosovo, which makes it difficult to compare our findings.

Similar to other countries, in our study there was evidence of an age-dependent positive correlation between systolic blood pressure and diastolic blood

pressure (8). There is considerable evidence from the international literature linking high levels of systolic and diastolic blood pressure with stroke, and the ischemic heart disease (7,8). Therefore, there have been consistent reports suggesting that hypertension is the number one risk for mortality because of its dominant role in cardiovascular pathogenesis (7,8). In addition, for transitional countries of the Western Balkans including Albania and Kosovo, the rapid pace of transition and its inherent association with hypertension (10), including also the reduced energy expenditure and resultant obesity, bear important implications for both the health care and health promotion sectors in these countries.

Despite the evidence on a fall in blood pressure levels during the last decade in Europe, it has been argued that hypertension will remain one of the

most important cardiovascular risk factors given the ageing trend of the population worldwide (8). Therefore, in order to control and prevent the magnitude of hypertension at a population level, the well-known suboptimal hypertension control rates should be of great concern to health care professionals (8). In parallel, intensive efforts should be done in order to identify and test new strategies for an improvement in awareness and effective treatment for hypertension, which are crucial measures to control the extent of hypertension at a population level (8,11).

Our study may have several limitations including the sample representativeness and potential information biases. In our study, we included a large sample of consecutive primary health care users of both sexes. In addition, the response rate in our study was very high (95%). Also, respondents and non-respondents did not differ significantly in terms of age and sex. As for the possibility of information bias, we

applied standard procedures of systolic and diastolic blood pressure measurements in all study participants. However, the information on socioeconomic characteristics was based on self-reports. Therefore, we cannot exclude entirely the possibility of differential reporting of the socioeconomic characteristics between different groups of individuals distinguished by the presence of hypertension. Finally, associations reported in cross-sectional studies should be interpreted with extreme caution, because they are not considered to be causal. Therefore, future prospective studies in Kosovo should confirm the validity of our findings.

In conclusion, our findings indicate a relatively high prevalence of hypertension in the adult population of post-war Kosovo, especially among men and the most disadvantaged socioeconomic groups. Health care professionals and policymakers in Kosovo should be aware of the high burden of morbidity and mortality-related outcomes associated with hypertension.

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