Prevalence and Determinants of Hypertension in Mazar Sharif Citizens, Afghanistan-2015

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Conflict of Interest: None declared

This article has been peer reviewed.

Article Submitted on: 31st December 2016

Article Accepted on: 7th June 2017

Funding Sources: None declared

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Cite this Article: Saeed KMI. Prevalence and determinants of hypertension in Mazar Sharif citizens, Afghanistan-2015. J Pioneer Med Sci 2017; 7(4): 42-46

ABSTRACT

BACKGROUND: Hypertension is a major public health challenge worldwide. This study aims to estimate the prevalence and characterize factors associated with hypertension in Mazar Sharif, Afghanistan.

METHODS: A cross-sectional study was conducted in Mazar Sharif from April to May 2015 using the World Health Organization (WHO) STEP-wise approach. Data on demographic, socioeconomic and lifestyle factors were collected including blood samples for testing blood glucose and lipids. Bivariate and multivariable analyses were undertaken to explore the association between hypertension and potential predictors.

RESULTS: Of the 1,231 participants, 664 (53.9%) were females. The prevalence of hypertension was 30.9% (95% CI: 28.3 – 33.4). Factors independently associated with hypertension were: age groups of 35 – 45, 45 – 55 and 55+ (OR=2.63, 95 % CI: 1.80 – 3.84; OR=5.32, 3.52 – 8.04; OR=10.99, 7.19 – 16.81) compare to 25-34 age group; gender (male) (OR=1.67, 95%CI:1.21 – 2.32); marital status (OR=3.12, 95%CI:1.21 – 8.05), reclining ≤ 3 hours per day (OR=0.63, 95%CI:0.46 – 0.85); central obesity (OR=2.16, 95%CI:1.53 – 3.04); BMI ≥ 30Kg/m2 (OR=2.33, 95%CI: 1.61 – 3.36).

CONCLUSION: We found high prevalence of hypertension in this study cohort. As in other studies, we found that age, gender, marital status, staying at home, central and general obesity were predictors of hypertension. It is likely that strategies aimed at lowering blood pressure in other parts of the world will be useful in our study population.

Keywords: Prevalence; Determinants; Blood pressure; Hypertension; Urban; Afghanistan

INTRODUCTION

Hypertension is widely prevalent in both economically developed and developing nations [1, 2]. An estimated one billion people are affected with hypertension [3-5]. High prevalence in parts of South Asia is thought to be the result of a combination of genetic susceptibility and lifestyle transition [6]. Predictors of hypertension in high income countries include age, family history, race, physical inactivity, obesity, cigarette smoking, excessive salt and alcohol intake [4, 5] of which some are modifiable [7].

In Afghanistan, due to years of war and conflict, it has been challenging to develop estimates of prevalence of non-communicable diseases including hypertension. According to a survey of adults in Afghanistan, the prevalence of hypertension in Kabul city, the capital of the country, among urban citizens in age group of ≥ 40 years was 46.2% and in Jalalabad city in age group of ≥25 years was 28.4% [8, 9]. There are no statistics for other parts of Afghanistan. Balkh province is a big northern province of Afghanistan neighbouring Uzbekistan in the north. The province comprises 15 districts including Mazar Sharif city. The population for 2015 was estimated to be 1,353,626 of which 692,436 were male. However, we have included the urban portion of Mazar Sharif city, which has an estimated population of 415,053 with 212,918 males [10]. The purpose of this article is to estimate the prevalence of hypertension and assess the predictors among adults in the Mazar Sharif city of the Balkh Province.

METHODS

Using the World Health Organization (WHO)

STEP-wise tool, the research team conducted a cross-sectional study from April to May 2015 to estimate the prevalence of risk factor for noncommunicable diseases including hypertension and its associated factors in Mazar Sharif city, Balkh province. All permanent household members older than 25 years including men and women who were residents of the city in the Balkh province during the study period were eligible for participation. Using the multistage cluster strategy, initially five districts were selected randomly. In the second stage, from each selected district we randomly selected five areas. The number of households in each area was then divided by the sample size assigned for each area, which enabled selection of household. Within each household, adults older than 25 years were randomly selected for inclusion in the study interview. A household was defined as a group of people who share the same food pot but may or may not share the same roof. Sample size estimation was based on a prior specified precision level of 5% and the assumption that the proportion of potential risk was similar to other studies conducted in other similar settings. We adjusted for intracluster correlation and concluded that 1,200 participants would be required. According to recent Afghan Household Survey conducted in 2015, approximately 31.5% of the population in Afghanistan is in the age group of 25-70 years. Therefore, we can estimate that the target population for this study was 128,666 urban citizens and approximately one percent of the total urban population was included in the study [11]. Height and weight were measured by measurement tape and an electronic weighing scale. Using standard international criteria, we defined a BMI of ≥ 30kg/m^2 as obese and a BMI of 25 - 30 kg/m^2 as overweight. A BMI of 18.5 to 25 kg/m^2 was considered normal. A waist circumference of ≥ 94 cm for men and ≥ 80 cm for women was considered centrally obese [12, 13].

Blood pressure was measured thrice by android sphygmomanometer in the sitting position on the left arm. Before analysis, blood pressure was dichotomized to hyper- or normotension by either systolic of ≥ 140 mmHg, diastolic of ≥ 90 mmHg, or both. Hypertension status was determined based on measurement of high blood pressure and consideration of the individual's current hypertension treatment status. Following the interview, blood samples were collected the next morning after the study participant had fasted for 10–12 hours. Blood samples were transported in cool boxes (2-8°C) from the field to provincial public health office on the day of sample collection. After processing and separation, the samples were shipped to Central Public Health Laboratory (CPHL) in Kabul. On arrival in CPHL, all serum samples were stored at -80°C until biochemical testing was conducted. Collection of blood samples, processing, shipment and testing were done using Standard Operating Procedures (SOP) developed by CPHL [14].

Data on potential covariates such as age, sex, educational status, income, obesity, diabetes mellitus, smoking status, snuff usage, physical activity and dietary behavior were collected using a structured, pretested and modified questionnaire. No questions regarding alcohol consumption were included as it is legally forbidden. For normally distributed variables, mean and standard deviation (SD) were calculated; and for categorical variables, frequencies were determined. We derived both bivariate and multivariate estimates of odds ratios (OR) and 95% confidence interval (95%CI). Data were analyzed using SPSS 20 [15]. Ethical approval was obtained from the Institutional Review Board (IRB) of the Ministry of Public Health, Afghanistan.

RESULTS

We enrolled 1,249 participants; all completed the survey and provided blood samples, however, 18 samples were either inadequate or damaged during shipment and could not undergo laboratory tests. Thus, 1,231 participants had complete data and were included in the statistical analysis. Of all study subjects 664 (53.9%) were females, mean age was 40.5±13.2 years; two third (68.5%) were younger than 45 years. More than half of the respondents (59.3%) were illiterate; and 72% of the participants had income less than 10,000 Afghanis (AFN) (USD145). Majority of respondents (83.7%) were married and more than 85.5% of women did not work outside home. Ten percent were government and nongovernment employees and the rest were engaged in the private business and other industries. Almost 10% were smokers and 8.3% were mouth-snuff users. Twenty percent of respondents consumed fruits more than 3 days per week while 49.1% consumed vegetables on same frequency. Almost 12% of the respondents practiced vigorous physical activity and 28.2% of subjects reported doing moderate physical activity. Almost half (48.5%) of study respondents were overweight or obese and more

Table 1: Bivariate analysis of bio-demographic, socio economic and behavior risk factors associated with hypertension among study participants in Mazar Sharif (n=1231)

Variables	Normal BP (N) (%)	Hypertensive (N)(%)	OR (95% Confidence Interval)
Age in years			
25 – 35	491 (88)	69 (12)	1
35 – 45	188 (66)	95 (34)	3.596 (2.527 - 5.116)
45 – 55	94 (50)	94 (50)	7.116 (4.861 - 10.417)
55 and over	78 (39)	122 (61)	11.13 (7.613 - 16.272)
Sex			
Females	425 (64)	239 (36)	1
Males	426 (75)	141 (25)	0.589 (0.459 - 0.754)
Level of Education			
Illiterate	474 (65)	256 (35)	1
Literate	376 (75)	124 (25)	0.611 (0.474 - 0.787)
Monthly Income			
≤ 150USD	615 (69)	271 (31)	1
>150USD	172 (70)	344 (30)	0.963 (0.707 - 1.312)
Smoking Status			
No	752 (67.8)	357 (32.2)	1
Yes	99 (81.1)	23 (18.9)	0.489 (0.306 - 0.784)
Snuff Using			
No	781 (69.2)	348 (30.8)	1
Yes	70 (68.6)	32 (31.4)	1.026 (0.663 - 1.588)
Strong Physical Activity			
No	735 (68.2)	343 (31.8)	1
Yes	116 (75.8)	37 (24.2)	0.683 (0.462 - 1.011)
Moderate Physical Activity			
No	585 (66.2)	299 (33.8)	1
Yes	266 (76.7)	81 (23.3)	0.596 (0.448 - 0.792)
Taking fruits weekly in days			
≤ 3 days per week	670 (68.9)	302 (31.1)	1
> 3 days per week	178 (69.8)	77 (30.2)	0.96 (0.711 - 1.295)
Reclining in hours per day			
≤ 3 hours per day	324 (75.7)	104 (24.3)	1
> 3 hours per day	526 (65.8)	274 (34.2)	1.623 (1.245 - 2.115)
Taking vegetables weekly in days			
≤ 3 days per week	451 (72)	175 (28)	1
> 3 days per week	400 (66.1)	205 (33.9)	1.321 (1.036 - 1.683)
Taking red meat weekly in days			
≤ 2 days per week	757 (68.3)	352 (31.7)	1
> 2 days per week	94 (77)	28 (23)	0.641 (0.412 - 0.995)
Taking rice weekly in days			
≤ 3 days per week	621 (69.2)	277 (30.8)	1
> 3 days per week	230 (69.1)	103 (30.9)	1.004 (0.765 - 1.318)
General Obesity cut off BMI=30			
No	762 (73.2)	279 (26.8)	1
Yes	89 (46.8)	101 (53.2)	3.099 (2.259 - 4.252)
Central Obesity			
No	425 (84.2)	80 (15.8)	1
Yes	425 (58.6)	300 (41.4)	3.75 (2.832 - 4.966)
Triglycerides			
< 150mg%	693 (70.7)	287 (29.3)	1
≥ 150mg%	158 (62.9)	93 (37.1)	1.421 (1.063 - 1.901)
Diabetes Mellitus			
No	788 (70.4)	330 (29.6)	1
Yes	63 (55.7)	50 (44.3)	1.895 (1.279 - 2.807)

than half (58.9%) were suffering from central obesity. The prevalence of either systolic or diastolic hypertension was 30.9%. Furthermore, 5% of participants indicated that they were aware of their high blood pressure because they were already undergoing hypertension treatment prior to the study. Of the sample population, 42 % and 27.1% of respondents had normal or pre-hypertensive status respectively. The results for bivariate analysis can be reviewed in Table 1.

Hypertension was found to be associated with age, gender and marital status. Taking fruits, vegetables, doing physical activity were not predictive and statistically significant. However,

reclining more, taking red meat, general and central obesity and level of high density lipoprotein (HDL) were predictors of hypertension. The results for multivariate analysis can be reviewed in Table 2.

DISCUSSION

We found that the prevalence of hypertension was high; almost one-third of the participants were hypertensive, a number comparable to other countries. Surprisingly, only 5% were aware of their hypertension and were being treated for it. This lack of awareness of hypertension suggests that health education and community-wide interventions is needed to increase awareness of hypertensive status and to improve health.

Factors that may lead to low awareness of hypertension in the community may include high level of illiteracy, low income and large proportions of people doing physical (labor) work. We found that age, gender, marital status, reclining status, general and central obesity, red meat consumption and high density lipoprotein were associated with hypertension. Our findings are similar to studies from other developing countries. Studies from Iran, Turkey, Sri Lanka, Angola and China found similar findings that older age, retirement/unemployment and higher body mass index were significantly associated with hypertension [18-20]. We did not find a statistically significant association of healthy dietary behaviors and habits like fruit and vegetable consumption although the effect sizes were in the protective direction. It is possible that healthy eating behaviors are a manifestation of socioeconomic status and thus were not significant in multivariable models. Indeed study from rural Nepal found that high BMI and low socio-economic status were associated with increase odds of hypertension [16-19]. Our study has important public health implications. Several factors such as sedentary lifestyle and obesity are all potentially amenable to intervention at a public health level. Sedentary lifestyles may stem from a lack of activity in school as a child, unemployment in adult life, or cultural barriers. Cultural sensitivities can be overcome as Almas and colleagues demonstrated in an innovative study of effective strategies to combat childhood obesity in urban Pakistan [20]. In addition to education, better use of the media to inform the population has potential for great impact as most households now have at least a television and/or radio.

Table 2: Multivariable analysis risk factors associated with hypertension among study participants Mazar Sharif (n=1231)

Variables	Adjusted OR (95% CI)	P-Value
Age 35 - 45 years	2.634 (1.805 - 3.843)	<001
Age 45 - 55 years	5.323 (3.522 - 8.046)	<001
Age > 55 years	10.997 (7.191 - 16.816)	<001
Male	1.677 (1.212 - 2.319)	<005
Married	3.119 (1.208 - 8.049)	<005
Reclining ≤3 hours per day	0.63 (0.464 - 0.856)	<005
Eating red meat >2 days per week	1.577 (0.953 - 2.609)	<08
General Obesity as BMI cut off 30	2.336 (1.618 - 3.367)	<001
No Central Obesity	0.463 (0.329 - 0.65)	<001
HDL <40mg/dL for males and 50mg/dL for females	1.444 (1.073 - 1.941)	<05

This is the first study of this kind conducted in Mazar Sharif reporting hypertension prevalence and can help in developing community-level preventive measures. Our study has some limitations including the number of risk factors that were evaluated. A glucose tolerance test would have helped with a better assessment of presence of diabetes in the community, a disease commonly seen with hypertension. Due to security, some parts of the city were excluded from the sampling frame. However, our findings are consistent with the prevalence of hypertension and its risk factors from other epidemiological studies suggesting that our methods were robust. The findings are hardly generalizable for urban settings all over the country due background differences.

CONCLUSION

In conclusion, we demonstrated that hypertension is prevalent in adults living in households in Mazar Sharif and that most participants did not know about their hypertensive status. As Afghanistan enters a new era of development, public health efforts and interventions must be prioritized. Prevention of hypertension and related risk factors can simultaneously facilitate achievement of sustainable development goals

and healthy living for residents of Mazar Sharif City, Balkh Province in Afghanistan.

ACKNOWLEDGEMENTS

I would like to thank Dr Hafez Rasooly Influenza Surveillance Coordinator at Surveillance Directorate (MoPH), Dr Naim Rahimi regional coordinator of diseases early warning system (DEWS) in Mazar Sharif, Dr Amin Sherpoor provincial surveillance officer for their contribution in sampling and data collection of the study.

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