

A study of blood pressure prevalence and some of its effective factors in different ethnicities in the rural population

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Abstract

BACKGROUND: High blood pressure is considered as one of the main problems in developed and developing countries. Undoubtedly, controlling blood pressure is a significant factor in the declining of case of fatal non-contagious diseases, and plays an important role in reducing the rate of mortality caused by these diseases. The purpose of this research is to investigate blood pressure prevalence and its effective factors in the population older than 30 years of age in Shaft, Iran, around 2007-2008.

METHODS: This is a descriptive, cross-sectional, and applied research, which is dedicated to surveying the relationship between family history of blood pressure, diabetes, and fatness with high blood pressure prevalence in 27,057 people older than 30 years of age. Data was collected via a questionnaire along with observation, and was analyzed by SPSS software.

RESULTS: Results showed that from the 27,057 screened people, 47.4% were male and 52.6% female. 49.6% of screened people were at risk of high blood pressure 56% of at risk individuals had BMI factor of more than 25 and 13.6% had family history of diabetes. From the total population under survey, 1.9% were suspected of having high blood pressure, 0.47% of whom were diagnosed by physicians for the first time. The highest frequency of prevalence (including old and new sick people) was observed in 22% of people of 70 years of age and older that implied the risk of high blood pressure will be raised by increasing of age. The prevalence of high blood pressure in women (12.6%) was higher than men (4.58%).

CONCLUSION: Overweight people, people that had family history of blood pressure and diabetes, and smokers were more at risk of high blood pressure compared to healthy people. Therefore, paying sufficient attention to risky cardiovascular factors in the treatment of high blood pressure, changing the patients' lifestyle, amending their diet and preventing them from immobility can be some of the effective ways of controlling risky factors.

Keywords: Blood pressure, Fatness, Diabetes, Family Background, Lifestyle

ARYA Atherosclerosis Journal 2012, 8(Special Issue in National Hypertension Treatment): S153-S157

Date of submission: 15 Jan 2012, *Date of acceptance:* 29 Mar 2012

Introduction

Undoubtedly, cardiovascular diseases will be the main cause of mortality in non-contagious illnesses throughout developing countries until 2020.¹ According to the WHO report (2002), 35% of mortal factors in the world have been due to cardiovascular diseases.² One of the most significant risky causes of cardiovascular diseases is high blood pressure. In fact, there is a direct relationship between high blood pressure and the risk of incidence of cardiovascular disorders; that is to say, the higher blood pressure is, the more possibility of stroke, heart attack, heart-failure, and kidney-failure will be.³

Explicitly, high blood pressure is the most popular cause of chronic kidney-failure outbreak after diabetes.⁴ In Iran, cardiovascular disorder is also the first and most prevalent mortality cause.⁵ Based on the statistics of Behesht Zahra (situated in Tehran), around 900-1200 people die due to heart diseases in Tehran every month.⁶ WHO approximates that nearly 600 million people in the world suffer from high blood pressure, and itself or its side-effects lead to 5.7 million deaths annually.⁷

A report prepared by the Heart Association of U.S.A showed that approximately 50 million Americans of 6 years of age and older suffer from

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high blood pressure.⁸ This statistic is 12%, 11%, and 30% in Egypt, China, and Sweden, respectively.⁹

A study under the subject of "The healthy Heart" in Isfahan, in 2003-2004 indicates a 15.6% prevalence of this disease in males, and 18.8% in females.¹⁰ Controlling high blood pressure has a significant impact on the declining of the rate of suffering from mortal non-contagious disorders, and plays a vital role in reducing the death rate due to them.

Prevention of high blood pressure includes preventing from infections and their effects.¹¹ The most effective factors, which are adjustable, on blood pressure consist of abnormal blood sugar, fatness, high cholesterol, immobility, alcohol drinking, habit of smoking, stress, and long time application of contraceptive pills. The nonadjustable factors are aging, sex, and genetic factors.¹² Nowadays, controlling high blood pressure in industrial countries reduces the death rate of cardiovascular diseases, apoplexy, and kidney disorders.¹³

Eastern Mediterranean countries, Egypt, Saudi Arabia, Jordan, and other countries have performed a plan of determining blood pressure prevalence in the form of national projects. Studying the prevalence of high blood pressure is one of the highest national-investigative priorities of developing countries suggested by WHO. Therefore, this research was performed to examine high blood pressure in those over 30 years of age in Shaft division of Gilan province, Iran.

As this province has different ethnic groups it could provide a suitable opportunity for comparing the blood pressure of these different ethnic groups.

Materials and Methods

This is a descriptive, cross-sectional, and applicable investigation for defining the relationship between family background of blood pressure, diabetes, and fatness, and high blood pressure in 27,057 individuals over 30 year of age.

Required data were collected via face-to-face interview with a prepared questionnaire and variables such as ethnic group (Talesh, Gilak), age, and physical mobility were inquired, and variables like weight, waste and blood pressure were measured by measuring tools (weighing scale, meter and pressure gauge). Blood pressure was measured by standard measuring methods. After the person under study had been seated for 15 minutes, his/her arm was situated on the heart in a resting position.

Blood pressure was measured twice in 15 intervals from the right arm and the average of measuring times was considered as the patient's blood pressure

criteria. High blood pressure was diagnosed by the standard of WHO and JNC-VI, systolic pressure higher than 140 mm mercurial pressure, diastolic pressure higher than 90 mm mercurial pressure, or use of anti-blood pressure drugs during the previous month.¹⁴

Body max index was considered normal in a range of 19-24 kg/m² for women, and 20-25 kg/m² for men. Those with a weight of 20% higher than normal weight were considered as fat.

Waist and hip circumference were measured by a non-flexible tape measure in a way that no pressure was put on the person's body with 1 mm precision. The selected individuals received a letter of introduction for blood sugar test for referring to the laboratory. Blood sugar, before breakfast, of equal to or more than 126 mg/dl was regarded as high blood sugar.

All data were entered into SPSS software, and analyzed via t-test, relation test, K square root, with 5% meaningful level. Evaluation of the adjusted effect of each variable was performed for high blood pressure, and logistic regression analysis.

Results

From the 27,057 selected people, 12,895 (47.4%) were male and 14,162 (52.6%) were female, of which them 24297(89.8%) were healthy, 2249 (8.3%) were sick with using anti-blood pressure drugs, and 511 (1.9%) were suspected to have high blood pressure disorder, 0.47% of whom were diagnosed by physicians for the first time. The criterion of high blood pressure was J.N-VI. The prevalence of high blood pressure was 8.78%, 4.58% of which were males and 12.6% female.

High blood pressure prevalence has a higher frequency in females, throughout all age groups. In addition, systolic blood pressure average had an ascending trend with increase in age. For males, the systolic blood pressure had an ascending trend while diastolic pressure showed a descending trend, which was statistically meaningful. Studying blood pressure in each separate age group indicated that increase in age resulted in increase in blood pressure in a way that the lowest blood pressure was observed in the group of 30-39 year olds. The highest rate, with 22% prevalence rate, was attributed to the group of people of 70 years or higher (Table 1).

The statistical comparison of high blood pressure between males and females showed a significant statistical difference, based on chi-square test with 95% confidence ($P = 0.000$), and women were 4.4 times more at risk of high blood pressure than men

(95% CI: 3.99-4.9).

Moreover, the results showed that 12,680 people (46.9%) were at risk of diabetes, 8.31% of whom had

a family history of high blood pressure, 56% had BMI factor higher than 25, and 13.6% had a family history of diabetes (Table 2).

Table 1. The prevalence of hypertension in different age groups above 30 years of age in Shaft

Age	Female		Male		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
30-39	43	1.04	10	0.26	53	0.66
40-49	203	5.98	40	1.30	243	3.76
50-59	462	15.39	104	4.31	566	10.45
60-69	506	28.68	151	9.5	657	19.6
70 and higher	571	30.29	286	14.3	857	22
Total	1785	12.6	591	4.58	2376	8.78

Table 2. Frequency distribution of factors related with hypertension in the study population

Effective factors of blood pressure	Female		Male		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Family history of diabetes	721	9.3	917	18.7	1638	12.9
Family history of blood pressure	523	6.7	224	4.6	747	5.9
overweight people	2830	36.4	1981	40.4	4811	37.9
Obese people	1594	20.5	707	14.4	2301	18.1
Family history of diabetes and fatness	1072	13.8	692	14.09	1764	13.9
Diabetic people	811	10.4	393	8	1204	9.5
Pre-diabetic	634	8.2	294	6	928	7.3
Smokers	93	1.2	751	15.3	844	6.7

Table 3. Regression coefficients of factors related with hypertension based on logistic regression models to L.R method

Variable	Regression coefficient b	Standard error	Value	Odds ratio	Confidence interval %95 for or
Sex					
Male	-	-	-	-	-
Female	1.487	0.052	0.000	4.422	3.997-4.893
Age					
30-39	-	-	-	-	-
40-49	1.885	0.188	0.000	6.589	4.557-9.528
50-59	3.175	0.180	0.000	23.933	16.823-34.049
60-69	4.154	0.178	0.000	63.720	44.944-90.339
70 and higher	4.425	0.178	0.000	83.493	58.899-118.358
Risk Factors					
No risk factor	-	-	-	-	-
Family history of family diabetes	0.527	0.103	0.000	1.694	1.384-2.074
Family history of family blood Pressure	-0.499	0.119	0.000	0.607	0.481-0.766
Obese	2.436	0.097	0.000	11.428	9.445-13.827
Overweight	1.077	0.099	0.000	2.935	2.415-3.566
Diabetes and fatness	0.646	0.102	0.000	1.909	1.562-2.332
Diabetes	0.102	0.108	0.343	1.108	0.896-1.369
Pre-Diabetic	-0.240	0.114	0.035	0.787	0.630-0.983
Smoker	-0.344	0.116	0.003	0.709	0.565-0.889
Ethnicity					
Talesh	-	-	-	-	-
Gilak	0.110	0.047	0.020	1.117	1.018-1.226

Results imply that people with a family history of diabetes were 1.69, family history of blood pressure 0.6, obese people 11.4, overweight people 2.9, diabetics 1.9, prediabetics 1.1, and smokers were 0.78 times more at risk of high blood pressure than healthy people. It is remarkable that there could be a significant relationship between family blood pressure backgrounds, fatness, smoking habit and high blood pressure ($P < 0.05$).

The prevalence of high blood pressure was higher in the Gilaky ethnicity in comparison with the Talesh ethnicity (the Turkish and Fars ethnicities were not studied due to the low population). Gilaky people had 1.1% more possibility of exposure to high blood pressure comparing with the Talesh ethnicity ($P = 0.02$). On the other hand, the prevalence of fatness was reported to be higher in the Gilaky ethnicity than the Talesh ethnicity (Table 3).

Discussion

The results showed that the prevalence of high blood pressure was 8.78% in the population under study. In the study of the Organization of Health and Cure and Medical Training (2007-2008), 13.3% of the adult population of Iran were at risk of high blood pressure,¹⁵ which is not in accordance with the current paper.

A study performed by Chaman et al. in the rural regions of Agh Gholi division showed 18.4% blood pressure prevalence.¹⁶ Moreover, a study on the population of older than 18 years in the Zabol province estimated a 13.9% blood pressure prevalence, of which 15% was attributed to females and 12.5% to males.¹⁷ The results of this study were not in accordance with the current paper.

According to the hypertension studies in other countries, large differences were observed in the prevalence of the disease.

For instance, the outbreak rate in the American population of 18-74 years of age, was 29.7% of which 22.2% and 37.9% were attributed to French male and females, respectively, in Saudi Arabia 23.9% and 28.6%, in Tunisia 15% and the center of Canada 20% without regarding for sex difference. These results are not in accordance with the current paper.^{18,19}

Based on results, there can be a significant relationship between body mass index and high blood pressure. Moreover, fatness is a risky factor of high blood pressure. A study by Gudarzi et al. revealed a positive and significant correlation between body mass index and high blood pressure (Zabol research).¹⁷

Studies show that decreasing in weight in fat people is related with declining of blood pressure.

Weight control not only decreases blood pressure, but also is effective in decreasing other risky cardiovascular causes, like blood fat. Furthermore, diagnosis of overweight side effects, including hypertension, can be an effective motivation for sick people and their families.²⁰

Moreover, regular physical activities (30-60 minutes with mean intensity on most days) are recommended for the prevention of fatness, hypertension, and other risky cardiovascular causes.²¹

This study shows that, prevalence of high blood pressure can be raised significantly in both sexes, by the increase in age. Old age is considered as an important risk factor for high blood pressure; this was confirmed by regression analysis ($P = 0.000$). The results, which revealed high blood pressure in females comparing with males in all age groups, are in conformity with the researches of Ozkara et al., Prencipe et al., and Lu FH et al.²²⁻²⁴

In the current study, prevalence of high blood pressure in the Talesh ethnicity was reported less than that attributed to the residential diversity and lifestyle of two ethnicities (Gilak and Talesh). This was due to the fact that the Talesh people live in the mountainous and forest regions, and engage more in agriculture and stock breeding.

Consequently, they have physical activity, which is in conformity with the study of Chaman who believes fatness, high BMI, and lack of physical activity in the Turkman to be the second reason for high blood pressure.

The regression analysis explained that overweight people, those with family history of blood pressure and diabetes, and smokers were more at risk of high blood pressure. Therefore, it is necessary to pay more attention to the cardiovascular risk factors.

In fact, lifestyle changes, diet modifications, and prevention from immobility can be significantly effective in controlling risk factors.

Conflict of Interests

Authors have no conflict of interests.

References

1. Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study. *Lancet* 1997; 349(9064): 1498-504.
2. Ghazanfari N, Bahoedini S, Mohammad Alizadeh Z. Determine the prevalence of risk factors of coronary artery disease of population in the Kerman city. *Proceedings of 14th Congress of Cardiology in Iran*; 2004 May 22-24; Tehran, Iran; 2004. p. 172-73. [In Persian].

3. Lewington S, Clarke R, Qizilbash N, Peto R, Collins R. Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies. *Lancet* 2002; 360(9349): 1903-13.
4. Lim HS, MacFadyen RJ, Lip GY. Diabetes mellitus, the renin-angiotensin-aldosterone system, and the heart. *Arch Intern Med* 2004; 164(16): 1737-48.
5. Maghsod Nia SH. Primary of medical care of elderly with colleague of universal health organization. Tehran: University of Scientific Welfare and Rehabilitation Publication; 2007. p. 71. [In Persian].
6. Mehdinia M. New found in the prevention cardiovascular risk factors, abstracts article cardiovascular nursing. Proceedings of the 13th Congress International Cardiovascular; 2007 May 19-20; 2007. p. 173.
7. Jafari Varjoushani M, Anoushe M, Ahmadi F, Namadian M. The effect of family counseling on blood pressure in women with high blood pressure. *J Zanjan Univ Med Sci* 2004; 12(47): 23-8.
8. American Heart Association. Heart disease and stroke statistics. Dallas: American Heart Association; 2005.
9. Roushandel M. Effect of weight loss in the primary prevention of high blood pressure in obese women in Tehran [MSc Thesis]. Tehran: School of Medicine, Tarbiat Modares University; 1997. [In Persian].
10. Sadeghi M. Relationship of hypertension with other risk factors for cardiovascular disease in an Iranian population [Project]. Isfahan: Isfahan University of Medical Sciences; 2002. [In Persian].
11. Azizi F. Epidemiology of common diseases in Iran. 1st ed. Tehran: Eshtiagh Publication; 1992. p. 53. [In Persian].
12. Brunner LS, Suddarth DS, O'Connell Smeltzer SC, Bare BG. Brunner and Suddarth's textbook of medical-surgical nursing. 8th ed. Philadelphia: J.B. Lippincott; 1996. p. 641-3.
13. Fakhzadeh H, Pour Ebrahim R, Amini Nik S, Mahboub Nia M, Khakzad M. Determining of hypertension in the population over 19 years in Bushehr. *Iran South Med J* 1998; 1(3): 223-31. [In Persian].
14. Ghorbani R, Askandarian R, Malek M, Rashidy-pour A. Prevalence of Hypertension among the Adult Population of Semnan Province. *Iran J Endocrinol Metab* 2009; 10(5): 495-503. [In Persian].
15. National research center of the Medical Sciences. Investigation of health and disease in Iran. Tehran: Research Deputy of Health and Medical Education Ministry; 2001. p. 5-26. [In Persian].
16. Chaman MR, Yonesian M, Haji Mohammadi A, Gholami Taromsari M. Study of blood pressure prevalence & some of its effective factors in rural population with folk variations. *Knowledge Health* 2008; 3(4): 39-42. [In Persian].
17. Gudarzi MR, Ghanbari MR, Badakhsh M, Masinaei Nejad N, Abbas Zadeh M. The prevalence of hypertension in the population over 18 years in the Zabol. *Zahedan J Res Med Sci* 2002; 4(4): 183-90. [In Persian].
18. Kearney PM, Whelton M, Reynolds K, Whelton PK, He J. Worldwide prevalence of hypertension: a systematic review. *J Hypertens* 2004; 22(1): 11-9.
19. Asmar R, Vol S, Pannier B, Brisac AM, Tichet J, El HA. High blood pressure and associated cardiovascular risk factors in France. *J Hypertens* 2001; 19(10): 1727-32.
20. Epstein LH, Myers MD, Raynor HA, Saelens BE. Treatment of pediatric obesity. *Pediatrics* 1998; 101(3 Pt 2): 554-70.
21. Krebs NF, Jacobson MS. Prevention of pediatric overweight and obesity. *Pediatrics* 2003; 112(2): 424-30.
22. Ozkara A, Turgut F, Kanbay M, Selcoki Y, Akcay A. Population-based cardiovascular risk factors in the elderly in Turkey: a cross-sectional survey. *Central European Journal of Medicine* 2008; 3(2): 173-8.
23. Prencipe M, Casini AR, Santini M, Ferretti C, Scialfaferri N, Culasso F. Prevalence, awareness, treatment and control of hypertension in the elderly: results from a population survey. *J Hum Hypertens* 2000; 14(12): 825-30.
24. Lu FH, Tang SJ, Wu JS, Yang YC, Chang CJ. Hypertension in elderly persons: its prevalence and associated cardiovascular risk factors in Tainan City, southern Taiwan. *J Gerontol A Biol Sci Med Sci* 2000; 55(8): M463-M468.

How to cite this article: Afkar A, Kazem Nezhad E, Shams M, Farmanbar R. **A study of blood pressure prevalence and some of its effective factors in different ethnicities in the rural population.** *ARYA Atherosclerosis Journal* 2012; 8(Special Issue in National Hypertension Treatment): S153-S157.