

## Prevalence of hypertension and its association with certain demographic characteristics of blood donors in Ilam, Iran

Mansour Amraei<sup>1</sup>, Hassan Reza Mohammadi<sup>2</sup>, Hamid Taghinejad<sup>3</sup>, Zahra Ghobadian<sup>4</sup>, Masoumeh Shoohani<sup>5</sup>, Farajolah Maleki<sup>6\*</sup>

1. Department of Physiology, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran
2. Department of Neurology, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Department of Nursing, Faculty of Nursing and Midwifery, Ilam University of Medical Sciences, Ilam, Iran
4. Student Research Committee, Ilam University of Medical Sciences, Ilam, Iran
5. Department of Nursing, Faculty of Allied Medical Sciences, Ilam University of Medical Sciences, Ilam, Iran
6. Clinical Microbiology Research Center, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran

\*Corresponding author: Tel: +98 9128704856

Address: Clinical Microbiology Research Center, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran

E-mail: fmaleki88@yahoo.com

Received; 2015/02/15 revised; 2015/03/12 accepted; 2015/04/22

### Abstract

**Introduction:** Hypertension is described as one of the risk factors for cardiovascular disease. The prevalence of hypertension is growing among developing countries. In this study, the prevalence of hypertension was studied in individuals who referred to blood transfusion center of Ilam city.

**Materials and methods:** The present descriptive analytical study was performed based on available data. The sample files were related to 4005 cases. Blood pressure was measured by using the standard method 15 minutes after the individuals attained to blood transfusion center. Data by data were analyzed by using SPSS software and appropriate statistical tests including chi-square and ANOVA.  $P < 0.05$  was considered as significant.

**Results:** Systolic and diastolic blood pressure were significantly associated with age ( $P < 0.001$ ). There was a significant correlation between systolic blood pressure with gender ( $P < 0.05$ ), but there was no association between diastolic blood pressure with gender. Men significantly had higher systolic blood pressure than women ( $P < 0.05$ ). In addition, in both genders among aged over 40, systolic blood pressure was significantly lower, compared to aged less than 40 ( $P < 0.05$ ).

**Conclusion:** Overall, this study demonstrated that prevalence of hypertension is high in Ilam city and a detailed applicable plan in order to change in lifestyle among people to controlling and reducing of hypertension.

**Keywords:** Hypertension, Prevalence, Blood Donors

### Introduction

Hypertension is known as a major risk factor for cardiovascular disease (1-3). Therefore, hypertension is considered as a main reason for admission of a large

number of patients in emergency departments of hospitals (1, 4).

Cardiovascular disease has the highest rates of morbidity and mortality in

industrialized countries and also it is increasing in developing countries (5). According to classification of the World Health Organization, there are 17 main reasons for mortality in that cardiovascular diseases are classified as seventh reason; however, cardiovascular disease mortality has the first rank in Iran (6). Screening and controlling of hypertensive patients is considered as one of the primary objectives in prevention of cardiovascular diseases (7).

In adults, the systolic blood pressure of 140 mmHg or above and diastolic blood pressure of 90 mmHg or above are considered as hypertension. According to epidemiological studies in Eastern Mediterranean and Middle East countries, the prevalence of hypertension in different studies is reported from 10 to more than 17%. Studies which carried out in Iran indicated the high prevalence of hypertension. In health survey that conducted in 24 provinces among 69 to 72 year old patients, the diastolic blood pressure of 90 mmHg or above was reported 14% among 12 to 69 year old patients as high blood pressure (8).

A study that conducted in 1998 in Ilam illustrated that, the mean systolic blood pressure and diastolic blood pressure of the subjects were 133.25 mmHg and 80.67 mmHg respectively. 20.32% of patients demonstrated systolic and 30.7% diastolic hypertension (9). Abnormal blood pressure is one of the reasons for donor deferral in blood donors (10, 11). According to guideline of National Blood Transfusion Center, blood pressure should be  $90 \leq BP \leq 180$  mmHg and diastolic pressure should be  $50 \leq BP \leq 100$  mmHg among blood donation volunteers, for prevention of complications in patients with high or low blood pressure (12).

Due to various complications of hypertension and its being asymptomatic in most cases, high blood pressure is one of the reasons for deferral of blood donors. Screening and identification of donors with high blood pressure reduce the

complications and also reduce health care and hospital costs due to complications and late diagnosis of disease. On the one hand, surveillance and control of people with hypertension is considered as one of the primary purposes of prevention of cardiovascular diseases (13). Therefore, regarding to high prevalence of cardiovascular disease and the role of hypertension in creating these conditions, we decided to conduct a study to determine the prevalence of hypertension and its association with demographic profile of blood donors attending the blood transfusion center in Ilam.

### Materials and methods

The present descriptive analytical study was based on data available. The statistical population included referents to blood donation center of Ilam from 2010-2011. 4005 patients were entered into the study by using census records. Data included the number of blood donors, demographic information (age, sex, marital status, education level and occupation), systolic and diastolic blood pressure of donors that were controlled by the physician using standard methods, 15 minutes after individuals attained to blood transfusion center

### Statistical analysis

The data were analyzed by using SPSS software and appropriate statistical tests including chi-square and ANOVA.  $P < 0.05$  was considered as significant.

### Results

The mean age of the subjects was  $34.21 \pm 10.22$  years. The youngest and the oldest donor were 18 and 79 years old, respectively. Average age of males was  $33.88 \pm 10.09$  years and for females were  $36.66 \pm 10.81$  years. Average weight of samples was  $79.83 \pm 12.12$  kg. Average weight of males and females were  $80.59 \pm 11.96$  kg and  $74.63 \pm 11.99$  kg, respectively.

The mean systolic blood pressure of samples was  $120.1 \pm 1.33$  mmHg and mean diastolic blood pressure was  $80.7 \pm 0.55$  mmHg. The mean systolic blood pressure among women was  $118.3 \pm 1.44$  mmHg; diastolic blood pressure was  $77.5 \pm 0.66$

mmHg. Mean systolic blood pressure in men was  $120.3 \pm 1.32$  mmHg and diastolic blood pressure was  $80.7 \pm 0.55$  mmHg, indicated that diastolic and systolic blood pressure among men is higher than women (Table1).

Table 1. The mean and standard deviation of systolic and diastolic blood pressure.

Sex	The mean systolic blood pressure(mmHg)	The mean diastolic blood pressure(mmHg)
Men	$120.3 \pm 1.32$	$80.7 \pm 0.55$
Women	$118.3 \pm 1.44$	$77.5 \pm 0.66$
Total of samples	$119.3 \pm 1.33$	$79.1 \pm 0.56$

The majority of patients (69.3%) had normal systolic blood pressure less than 130 mmHg and diastolic blood pressure in the majority of patients (93.8%) was normal and it was less than 85 mmHg.

907 patients (31%) had a systolic blood pressure more than normal range that included mild to moderate blood pressure and in 183 (6.22%) diastolic blood pressure was more than normal range that included mild to moderate blood pressure. systolic blood pressure and diastolic blood pressure were significantly associated with age ( $P < 0.01$ ). There was also a significant association between systolic blood with gender ( $P < 0.05$ ) but there was no association between diastolic blood pressure and gender. Diastolic blood pressure was significantly higher among men than women ( $P < 0.05$ ) and in those aged over 40, in both sex groups, it was significantly lower, compared to group less than 40 years old ( $P < 0.05$ ).

## Discussion

Generally, the prevalence of hypertension in present study was 31%, with a mean systolic blood pressure  $120.1 \pm 1.33$  mmHg and mean diastolic blood pressure  $80.7 \pm 0.55$  mmHg, which is similar to previous study conducted by Delpisheh and Sayehmiri that performed on 342 of employees in Ilam, the results of their study indicated that , 32.20% of cases had systolic hypertension and 30.7% had diastolic hypertension; and average of systolic hypertension and diastolic

hypertension were 133.25 mmHg and 80.67 mmHg respectively (9). The results of study that conducted in the United States on persons aged 25-74 showed, the high prevalence of hypertension was 33.2% in Chicago (14).

This rate was 35.4% in Damirchi and Mehrabani ' study among taxi drivers in Tehran (15). Results of the present study in this field are similar to studies which were mentioned, while other studies showed less incidence of hypertension, so Sadeghi et al. in a cross-sectional study on people over 19 years in Isfahan found that 15.6% of men had hypertension (16).

While the study by Yousefnejad et al. on 1854 blood donors in Sanandaj revealed 7.5% of mild hypertension in blood donors (17). Farshidi et al ' study on 2,087 persons over 18 years showed that mean blood pressure among men was 84 and among women was 8 mmHg (18). The results of study that was performed by Amirkhizi et al. showed 14.3% of women were diagnosed with hypertension (19). The epidemiologic study by Navaii et al. on Tehran villages indicated that the prevalence of systolic hypertension was 11.1% and diastolic hypertension was 22.2% (20). Investigation of hypertension prevalence and its relationship with anthropometric characteristics among adolescent girls carried out in Rafsanjan by Salem indicated that the prevalence of systolic and diastolic blood pressure among girls was 10.2% and 9.2% respectively (21). The results of study

which conducted on ordinary people in Urmia showed that the prevalence of hypertension was 19.4%, which was higher in women than men (22). The results of study which conducted in England on 1,100 workers and in West Africa on over 45 year old people showed that the prevalence of hypertension was 14% (23, 24).

Also, the study conducted in Italy on 1976 blood donors from 18 to 65 years old the results indicated that the prevalence of underlying hypertension in men as 22.3% and 15.7% among women (25).

In present study there was a significant correlation between systolic blood pressure with gender, so systolic blood pressure was higher among men than women that is similar to studies conducted by Sadeghi et al. (16), Sayehmiri (9) and Farshid (18). But it is inconsistent with study which performed by Yousefnejad et al. (17), and Mehri et al. (22). In addition, there was no significant association between diastolic blood pressure with gender, which is similar to Yousefnejad

' study (17). Systolic blood pressure and diastolic blood pressure was significantly associated with age which is similar to Sayehmiri ' study (9). There was a significant association between age and systolic blood pressure in study was performed by Yousefnejad and hypertension was higher among people over 45 years old (17).

The results of several studies demonstrated that the differences and similarities could be due to differences in sample size, age range, gender differences and cultural diversity. According to results of some of these studies, factors such as increasing of age, weight gain, smoking and anthropometric characteristics caused the blood pressure increase, while in present study the differences in age and gender were investigated. According to our results, hypertension rate in Ilam is high and detailed and applicable plan seems to be necessary in order to change in lifestyle to controlling and reducing of hypertension.

## References

1. Sanchez CG, Pierin A, Mion Jr D. Comparison of the profile of hypertensive patients seen in emergency unit with those receiving outpatient clinic treatment. *Rev Esc Enferm USP*. 2004; 38(1):90-8.
2. Coelho EB, Moyses NM, Palhares R, Cardoso MC, Geleilate TJ, Nobre F. Relationship between regular attendance to ambulatory appointments and blood pressure control among hypertensive patients. *Arq Bras Cardiol*. 2005; 85 (3):157-61.
3. Jardim PC, Gondim M, Monego ET, Moreira HG, Vitorino P, Souza W, et al. Hipertensão arterial e alguns fatores de risco em uma capital brasileira. *Arq Bras Cardiol*. 2007; 88(4):452-7.
4. Martin JF, Higashiyama E, Garcia E, Luizon MR, Cipullo JP. Perfil de Crise Hipertensiva: Prevalência e Apresentação Clínica. *Arq Bras Cardiol*. 2004; 83(2):125-30.
5. Meyers DG, Strickland D, Maloley PA. Possible association of a reduction in cardiovascular events with blood donation. *Heart*. 1997; 78(2):188-93.
6. Pourhoseingholi M, Fazeli Z, Ashtari S, Fazeli Bavand-Pour FS. Bayesian correction for mortality trend of oral cavity cancer. *Gastro Enterol Hepatol Bed Bench*. 2012; 5(1):8-12.
7. Guideline Subcommittee. World Health Organization. International society of hypertension guideline for management of hypertension. *J Hypertens*. 1999; 17(2):151-83.
8. Maleki M, Noohi F, Oraii S. Prevalence of cardiovascular risk factors in Tehran: Healthy health project. *Iranian Heart J*. 1988 ;11(1):130.

9. Delpisheh A, Sayemiri K. [Study of hypertension among the employees aged over 40 and its relation to the body mass index in Ilam]. *J Ilam Univ Med Sci*. 2002; 9(32):11-8. (Persian)
10. Gulen H, Tuzun F, Ayhan Y, Erbay A, Ozturk E, Inan S, et al. The evaluation of blood donor deferral causes. *Pediatr Hematol Oncol*. 2006; 23(2):91-4.
11. Farrales FB, Stevenson AR, Bayer WL. Causes of disqualification in a volunteer blood donor population. *Transfusion*. 1977; 17(6): 598-601.
12. Authors of Iranian Blood Transfusion Organization, Textbook of medical transfusion, the second volume the transfusion press, First Edition. 2009 P: 607-33.
13. Pishdad GR. Overweight and obesity in adults aged 20-74 in southern Iran. *Int J Obes Relat Metab Disord*. 1996; 20(10):963-5.
14. Freeman V, Fraser H, Forrester T, Wilks R, Cruickshank J, Rotimi C, et al. A comparative study of hypertension prevalence, awareness, treatment and control rates in St Lucia, Jamaica and Barbados. *J Hypertens*. 1996; 14(4):495-501.
15. Demirchi A, Mehrabani J. [The prevalence of overweight, obesity and hypertension and related risk factors in adult men]. *Olampic*. 2009; 3(47):87-103.(Persian)
16. Sadeghi M, Roohafza HR, Kelishadi, R. Blood pressure and associated cardiovascular risk factors in Iran: Isfahan Healthy Heart Programme. *Med J Malaysia*. 2004; 59(4):460-7.(Persian)
17. Yousefinejad V, Shahghaibi S, Arabzade M, Soori M, Darvishi N. [The prevalence of high blood pressure in blood donors and the relevant factors in Sanandaj Blood Transfusion Center in 2005]. *Sci J Iran Blood Transfus Organ*. 2007; 3(5):413-8.(Persian)
18. Farshidi H, Zare S, Bushehri E. [Association between blood pressure changes and obesity in over-18]. *Hormozgan Med J*. 2006; 10(2) :111-8.(Persian)
19. Amirkhizi F, Siasi F, Minaei S, Jalali M, Dorosti Motlagh AR, Chamari A. [Check the status of rural women's blood pressure in Kerman province and its relationship with anthropometric indices]. *Yafteh*. 2008; 10(2):30-8.(Persian)
20. Navaii L, Mehrabi Y, Azizi F. [An epidemiologic study of hyperlipidemia, obesity, and hypertension in Tehran villages]. *Iran J Endocrinol Metab*. 2000; 2(4):253-62.(Persian)
21. Salem Z. [The prevalence of hypertension and its association with the anthropometric indices in adolescent girls in Rafsanjan, 2007]. *J Rafsanjan Univ Med Sci*. 2010; 8(4):273-86.(Persian)
22. Mehri SA, Mostafaei A, Haj-Ebrahimi S. [Study of the incidence of hypertension and its risk factors in urban and rural communities]. *Urmia Med J*. 1375; 2(7):16-22. (Persian)
23. Catipovic-Veselica K, Buric D, Skrinjaric-Cincar S, Catipovic B. Arterial hypertension in workers: prevalence, awareness, treatment, control and heart changes. *Arh Hig Rada Toksikol J*. 1995; 46(3):313-21.
24. Kaufman JS, Owoaje EE, James SA, Rotimi CN, Cooper RS. Determinants of hypertension in West Africa: contribution of anthropometric and dietary factors to urban-rural and socioeconomic gradients. *Am J Epidemiol*. 1996; 143(12):1203-18.
25. Bellodi G, Berninin G, Manicardi V, Veneri L, Muratori L, Magnanini G, et al. Arterial hypertension in relation to life style and other cardiovascular risk factors. Epidemiologic study of a population of blood. *Minerva Cardioangiol*. 1994; 42(3):73-84.