

Original Articles

Hypertension among attendants of primary health care centers in Al-Qassim region, Saudi Arabia

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ABSTRACT

Objectives: The aims of the present work were to determine the prevalence of hypertension among attendants of primary health care centers in Al-Qassim region, Kingdom of Saudi Arabia. Also to investigate sociodemographic associates, and assess awareness among hypertensives.

Methods: Through cluster sampling 30 primary health care centers were selected. Forty attendants were chosen randomly from each center. A questionnaire inquiring sociodemographic characteristics and awareness was completed by interview with each participant. Using standardized methods the blood pressure, height and weight were measured.

Results: The study sample amounted to 1114 persons, 338 (30%) were hypertensives (blood pressure >140/90), 24% stage 1, 4% stage 2 and 2.5% stage 3. The prevalence

increased with age. It was higher in males (33%), single persons (44%), illiterate (33%), merchants (45%) and obese persons (35%). Age above 40 years, illiteracy, overweight and obesity were independently associated with hypertension with statistically significant value. Less than one 4th (23%) of hypertensives were aware of their hypertension.

Conclusions: Hypertension is a major public health problem. A routine measurement of blood pressure of all attendants of primary health care centers with periodic examination of those aged more than 40 years particularly overweight and obese persons should be implemented.

Keywords: Hypertension, primary health care centers, awareness.

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Hypertension is a challenge for public health bodies not only in industrialized countries, but also in developing countries all over the world.¹ It is a leading risk factor for coronary heart disease, congestive heart failure, stroke, ruptured aortic aneurysm, renal disease and retinopathy^{2,3} Epidemiological studies demonstrated a consistent, strong, continuous, graded, independent, predictive and etiologically significant relationship between higher levels of both systolic and diastolic blood pressure and mortality.^{4,5} A 20mmHg increase in

diastolic blood pressure (DBP) was associated with a 60% increased risk of death over a 2 year period.⁶ In the Eastern Mediterranean Region hypertension is estimated to affect 20%-26% of the population above 35 years of age.⁷ In the Kingdom of Saudi Arabia the prevalence of hypertension varies between 4% to 17% among males and 3% to 13% among females.⁸ As the role of primary health care physicians has increased in management of hypertension and the prevalence of hypertension in Al-Qassim region is one of the highest figures^{9,10} the aims of the present

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study were to determine the prevalence of hypertension among attendants of primary health care centres (PHCCs) in Al-Qassim region and to investigate some of its sociodemographic associates in addition to the assessment of awareness among hypertensives.

Methods. The study design was cross-sectional. With the assumption that the prevalence of hypertension was 20%, study power 80% and degree of precision, $\pm 5\%$ at 95% level of significance and design effect = 2. The sample size was determined to be at least 1004 attendants. Through cluster sampling 30 PHCCs were chosen from Al-Qassim region. Forty attendants more than 35 years old were chosen randomly from each PHCC. Data collection occurred at the PHCC. A physician from the center performed anthropometric and blood pressure measurements and administered the pre-designed questionnaires. The latter covered sociodemographic and awareness data. Subjects were weighed on a lever balance while wearing light clothes. Height was measured with the help of the vertical upright bar of the balance which had a mounted tape and movable horizontal bar that brought against the vertex of the subject while he/she stood with bare feet. Body mass index (BMI) was calculated, BMI < 25 kg/m² is normal, 25-29.9 kg/m² is overweight and 30 kg/m² or more is obese. For measurement of blood pressure participants were seated with their arm bared, supported and at heart level. Measurement began after 5 minutes of rest by a mercury sphygmomanometer. The disappearance of sound phase V was used for diastolic reading. The average of 2 readings separated by 5 minutes was considered. The measurements were repeated twice, 2 weeks apart and the mean was considered. Hypertension was diagnosed when mean BP ≥ 140 mmHg systolic and 90 mmHg diastolic on 2 readings or reported diagnosis of hypertension with recognized antihypertensive agents, or both.¹¹ Systolic BP of 130-139 mmHg or DBP of 85-89 mmHg was classified as high normal. Among hypertensives SBP of 140-159, 160-179, 180-209 and ≥ 210 mmHg were classified as stage 1, stage 2, stage 3 and stage 4. The values of the corresponding stages of DBP were 90-99, 100-109, 110-119 and ≥ 120 mmHg. When SBP and DBP fall into different categories the higher category was selected to classify the individual's blood pressure.⁴

Statistical analysis. Prevalence of hypertension was presented as percentages. Continuous variables were presented as means and standard deviations. The association between hypertension and categorical variables were tested using Chi square test. P-values of <0.05 were considered statistically significant. Adjusted odds ratio and its 95% confidence interval was calculated using multiple logistic regression analysis to identify factors independently associated with hypertension.

Table 1 - Sociodemographic characteristics and hypertension among attendants of primary health care centers in Al-Qassim, Kingdom of Saudi Arabia.

Characteristic	Total sample		Hypertension		P-value
	n	%	n	%	
Age in years					
<40	279	25	25	9	0.000
40-	407	37	106	26	
50-	225	20	99	44	
≥ 60	191	17	105	55	
Gender					
Male	442	40	145	33	0.162
Female	672	60	193	29	
Area					
Urban	534	48	155	29	0.360
Rural	580	52	183	32	
Nationality					
Saudi	1015	91	305	30	0.481
Non-Saudi	99	9	29	29	
Marital Status					
Single	32	3	14	44	0.07
Married	1082	97	324	30	
Education					
Illiterate	778	70	260	33	0.002
Primary	203	18	46	23	
Intermediate	51	5	8	16	
University	82	7	24	29	
Occupation					
Housewife	660	59	193	29	0.000
Teacher	106	9.5	27	25	
Soldier	144	13	33	23	
Merchant	151	14	68	45	
Others	53	5	17	32	
Body Mass					
Normal	233	21	50	21.5	0.000
Overweight	363	33	102	28	
Obese	518	46.5	186	35	
n=number, total number in sample = 1114					

Results. The study included 1114 persons. Their age ranged from 35 to 85 with a mean age 47.7 ± 10.7 years, 442 males (40%) and 672 females (60%), 1015 (91%) Saudi and 99 (9%) non Saudi, 1082 (97%) married and 32 single (3%). Three hundred and thirty eight (30%) of the studied sample were hypertensives, the majority of them 265 (24%) had stage 1 hypertension but only 2 (0.2%) had stage 4. Around one sixth (17%) had high normal blood pressure. Table 1 presents the sociodemographic characteristics and prevalence of hypertension in the study group. The association between age, education, occupation and body mass index and hypertension was statistically significant ($p < 0.05$). Table 2 shows the results of multivariate logistic regression analysis of sociodemographic variables with hypertension. Age above 40, illiteracy, overweight and obesity were all shown to be risk factors for hypertension.

Table 2 - Results of multivariate logistic regression analysis of sociodemographic characteristics and hypertension among attendants of primary health care centers in Al-Qassim, Kingdom of Saudi Arabia.

Characteristics	Odds Ratio	95% Confidence Intervals
Age in years		
40-	3.58*	2.23- 5.85
50-	8.73*	5.12-14.88
≥60	13.60*	7.73-23.95
Education		
Illiterate	2.84*	1.06- 7.55
Primary	1.38	0.58- 3.29
University	1.53	0.62- 3.77
Marital Status	0.48	0.22- 1.09
Occupation		
Housewife	1.14	0.68- 1.9
Soldier	0.8	0.40- 1.6
Merchant	1.23	0.69- 2.17
Other	0.86	0.40- 1.9
Body Mass		
Overweight	1.63*	1.06- 2.5
Obese	1.96*	1.69- 3.85
*= $p < 0.05$		

Only 41 (28.5%) of hypertensive males knew that they had hypertension and 19% of hypertensive females knew their blood pressure status.

Discussion. Prospective studies linked cardiovascular disease to 3 major risk factors namely hypertension, tobacco use and high level of serum cholesterol.¹² The present study revealed that 30% of attendants of PHCCs in Al-Qassim were hypertensives. Al-Nozha and Osman reported lower prevalence rates among the general population in the Kingdom of Saudi Arabia.¹⁰ A similar rate was reported in the general population of Tanzania where 30% of men and 29% of women had hypertension.¹³ A study in Latin America revealed that 27% of the population had hypertension.¹⁴ In Sweden, the prevalence of hypertension in Stockholm County was 12% with no gender difference.¹² The high prevalence reported by the present work is attributed to the nature of the study population as the attendants of PHCC are expected to have more illnesses, including hypertension than the general population.

As regards to age, the present study revealed that the prevalence of hypertension increased with age from 9% among those aged 35-40 to 55% among those aged ≥ 60 years. This finding is consistent with results of studies using similar or different designs, in different parts of the world at different times.^{3,4,13,15} As

regards sociodemographic factors and hypertension, Kaplan and Keil reviewed the literature and reported that a low level of education is associated with high prevalence of hypertension.¹⁶ On the same line, the present study found that the highest prevalence of hypertension was among illiterate persons (33%) and proved independent association between illiteracy and hypertension (OR=2.84, CI=1.06-7.55). Gupta et al in rural India¹⁷ and the Fifth Report of the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure in United States of America (USA) agreed upon this finding.⁴ The present work revealed a high prevalence of hypertension among overweight and obese persons (28% and 35%). The same finding was reported by Gupta et al in India.¹⁸ Also the Intersalt study supported the same finding and found that for a given average height a 10kg difference in body weight was associated with a 3 mmHg difference in SBP and a 2.2 mmHg difference in DBP.¹⁹ Studies on control of high blood pressure identified 4 barriers for successful control namely, lack of detection, lack of reference to care, lack of appropriate treatment and lack of long term maintenance.^{3,20} The present study found very low awareness rate. It was 28.5% among males and 19% among females. A similar finding was found in an Italian study where only 20% of men and women with hypertension were aware of it.²¹ Higher rates were reported by studies in USA which revealed that awareness was 51% in 1972, 64% in 1974-1975, 54% in 1976-1980 and 65% in 1980-1991.⁴

In conclusion, 30% of PHCC attendants had hypertension. Illiteracy, age above 40 years, overweight and obesity were independently associated with high prevalence of hypertension. Only one 5th of hypertensive women and one 4th of hypertensive men were aware of their blood pressure status. Routine measurement of blood pressure for all attendants of PHCC is recommended. Education programs for increasing knowledge with regards to the importance of periodic check ups of blood pressure is highly needed in particular for those aged more than 40 years, overweight or obese.

References

- Berrios X, Koppen T, Huiguang T, Khaltaev N, Puska P, Nissinen A. Distribution and prevalence of major risk factors of noncommunicable diseases in selected countries: WHO Inter-Health Programme. The Bulletin of the World Health Organization 1997; 75: 99-108.
- US Department of Health and Human Services. Screening for hypertension. In: The Guide to Clinical Preventive Services: task force. 2nd ed. 1996; Available from: <http://odphp.osophs.dhhs.gov/pubs/GUIDECP>
- Guibert R, Franco ED. Choosing a definition of hypertension: impact on epidemiological estimates. J Hypertens 1996; 14: 1275-1280.

4. The Fifth Report of the Joint National Committee on Detection, evaluation, and Treatment of High Blood Pressure (JNCV). *Arch Intern Med* 1993; 153: 154-183.
5. McMahon S, Peto R, Cutler J, Collins R, Sorlie P, Neaton J, et al. Blood pressure, stroke and coronary heart disease, part 1. Prolonged differences in blood pressure: prospective observational studies corrected for the regression dilution bias. *Lancet* 1990, 335: 765-774.
6. Kaufman JS, Rotimi CN, Brieger WR, Oladokun NA, Kadiri S, Osotimehin Bo et al. The mortality risk associated with hypertension: preliminary results of prospective study in rural Nigeria. *J Hum Hypertens* 1996; 10: 461-464.
7. World Health Organization/EMRO. Prevention and management of hypertension. Alexandria; World Health Organization, Regional Office for the Eastern Mediterranean: 1996 (EMRO Technical Publications Series No. 23).
8. EL-Hazmi MAF, Warsy AS, Al-Swailem AR, Al-Swailem AM. Prevalence of hypertension in adult Saudi population. *Saudi Med J* 1998; 19: 117-122.
9. Al-Shahri M, Mandil AMA, Elzubier AG, Hanif M. Epidemiological aspects and cost of managing hypertension in Saudi Arabian primary health care centres. *Eastern Mediterranean Health Journal* 1998; 4: 493-501.
10. Al-Nozha MM, Osman AK. The prevalence of hypertension in different geographical regions of Saudi Arabia. *Annals of Saudi Medicine* 1998; 18: 401-407.
11. Guidelines subcommittee of the WHO-ISH mild hypertension liaison committee. 1999 World Health Organization-International Society of Hypertension Guidelines for Management Of Hypertension. *J Hypertens* 1999; 17: 151-183.
12. Johansson J, Hellenius ML, Elofsson S, Krakau I. Self-report as a selection instrument in screening for cardiovascular disease risk. *Am J Prev Med* 1999; 16: 322-324.
13. Edwards R, Unwin N, Mugusi F, Whiting D, Rashid S, Kissima J et al. Hypertension prevalence and care in an urban and rural area of Tanzania. *J Hypertens* 2000; 18: 145-152.
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: 495-501.
15. Fletcher A, Bulpitt C. Epidemiology of hypertension in the elderly. *J Hypertens* 1994; 12 (suppl 6): 3-5.
16. Kaplan GA, Keil JE. Socioeconomic factors and cardiovascular disease. *Circulation* 1993; 88: 1973-1998.
17. Gupta R, Gupta VP, Ahluwalia NS. Educational status, coronary risk factors and coronary heart disease prevalence in a rural population of India. *BMJ* 1994; 309: 1332-1336.
18. Gupta R, Guptha S, Gupta VP, Prakash H. Prevalence and determinants of hypertension in the urban population of Jaipur in Western India. *J Hypertens* 1995; 13: 1193-1200.
19. Dyer AR, Elliot P. The INTERSALT study: relations of body mass index to blood pressure. *J Hum Hypertens* 1989; 3: 299-308.
20. Bloom JR. Hypertension control through the design targeted delivery models. *Public Health Rep* 1978; 93: 35-40.
21. Vaccarino V, Borgatta A, Gallus G, Sirtori CR. Prevalence of coronary heart disease risk factors in northern-Italian male and female employees. *Eur Heart J* 1995; 16: 761-769.