Assessing Risk Factors for Hypertension among Adults in Mosul a case-control study

Waleed Ghanim Ahmad Al-Taee
MBChB, MSc, PhD.

Abstract:

Background: Hypertension is a major public health problem. Despite extensive research in the etiology and contributing causes of essential hypertension, the pathogenesis of the condition is still not explained. Hypertension is probably multi-factorial.

Objective: To determine the prevalent risk factors of hypertension and its degree of association among adult patients in Mosul.

Patients & Methods: Study subjects include 600 adult patients from both sexes (300 cases and 300 controls). Data collection period was four months. A case–control study design has been adopted. A special questionnaire form has been prepared and filled in by the investigator himself for each patient (case and control) through direct interview with patients.

Results: Study results revealed a statistically significant association for the disease with male gender, marital states others than single and married, partly skilled occupations, type A personality, cigarette smoking , alcohol consumption, positive family history for hypertension and unhealthy dietary behavior. On the other hand, a negative statistical association has been proved between the disease and non-smoking, physical activity and body mass index ≤ 25.

Conclusion: Encouraging hypertensive patients for essential life style changes including adopting regular physical activity, controlling proper body weight, following a proper dietary regimen and quitting smoking and alcohol, looks to be an urgent necessity.

Key words: Hypertension, Risk factors.

Introduction:

Hypertension is the most prevalent medically treatable chronic cardiovascular disease affecting adult population all over the world [1] . It is a growing world wide problem [2]. In Iraq, its prevalence during the year 2006 was 14.4% [3].

Hypertension is referred to as "Silent Killer" because it is generally asymptomatic until there is end organ damage or found incidentally during routine blood pressure screening. Occasionally, headache, dizziness, visual disturbances, and palpitation could be the presenting symptoms [4, 5].

The main impact of hypertension lies in its effect as a leading cause of morbidity and mortality from coronary heart disease, stroke, and renal failure [6].

In more than 95% of cases, a specific underlying cause can not be found (primary hypertension). Hypertension is probably multi-factorial. It is more common in some ethnic groups specially Black Americans and Japanese, and nearly 40-60% are explained by genetic factors.

Increased vascular stiffness contributes to isolated systolic hypertension in elderly. Important environmental factors include high salt intake, heavy consumption of alcohol, obesity, lack of exercise and impaired intrauterine growth [7, 8].

In about 5% of cases, hypertension can be shown as a consequence of a specific disease or abnormality (secondary hypertension) leading to sodium retention and / or peripheral vasoconstriction. The most important causes of secondary hypertension are obesity, alcohol consumption, pregnancy induced, renal disease, endocrine diseases, drugs, coarctation of aorta and insulin resistance [9,10,11,12,13].

Study objective is to determine the prevalent risk factors of hypertension and its degree of association among adult patients in Mosul.

Subjects & Methods:

To start with, the research protocol has been discussed in details through a seminar conducted at community medicine department in Mosul. Essential official permissions have been obtained later from General Directorate of Health. A special consent form has been prepared to be signed in by each patient to be included in the study.

Data Collection period was four months. The study has been conducted at the medical and surgical consultation clinics and units at both Ibn Sina and Al-Jumhori teaching hospitals in Mosul.

Study subjects include 600 adult patients from both sexes (300 cases and 300 controls).

A case-control study design has been adopted to achieve the objective of the present study.

Case definition:

Adult hypertensive patient is that patient whose age ≥ 18 years and known to be hypertensive for more than one year who attend the medical consultation clinic and / or admitted to one of the medical units at Ibn Sina teaching hospital.

Control definition:

Adult normotensive patient is that patient whose age ≥ 18 years and known to be normotensive for more than one year (with out any anti-hypertensive therapy) who attend the surgical consultation clinic and / or admitted to one of surgical units at Al-Jumhori teaching hospital .

Data Collection tool was a specially designed questionnaire form which is prepared by the investigator himself through proper utilization of available related literatures taking in consideration the idea of specialized physicians at The Community Medicine Department in Mosul.

For each patient involved in the study, a separate questionnaire form has been filled in by the investigator through direct interview with the patient him / her self.

After collection of data, body mass index estimation for each patient was done using the following equation:

Body mass index = weight in Kg / height^2 in meter

Later on, computer feeding, tabulation of information and statistical analysis (P-value and odd ratio calculation) have been done. P-value < 0.05 considered significant.

Results:

Reviewing socio-demographic characteristics of study population, study results revealed a statistically proved significant association for the disease with male gender, marital states others than single and married, and partly skilled occupations with P-value of 0.032, 0.001, 0.000 and odds ratio of 1.43, 2.07 and 2.81 respectively. On the other hand, marriage was found having a protective association with P-value of 0.038 and odd ratio of 0.69 (**table 1),** cigarette smoking, alcohol consumption, positive family history positive family history for disease, and familial fatty dietary pattern with P-values of 0.000, 0.000, 0.001, 0.000, 0.000 and odds ratio of 3.09, 2.21, 3.97, 42.67 and 5.35 respectively . Regarding personal and familial characteristics, table -2- shows that a statistically strong association for the disease was present with type A personality, On the other hand a statistically significant protective association was found for non-smokers, physical activity and body mass index ≤ 25 with P- values of 0.000, 0.000, 0.050 and odds ratio of 0.16, 0.17 and 0.70 respectively (**table 2**) .

Table (1) Socio-demographic characteristics of study population

Socio-demographic parameter		Cases (n = 300)		Controls (n = 300)		Odds ratio	P-value
		No.	%	No.	%		
Age groups (in years)	≤25	12	4	3	1	4.13	0.022
	26-35	36	12	47	15.6	0.73	0.193
	36-45	57	19	49	6.3	1.20	0.392
	46-55	76	25.3	81	27	0.92	0.642
	≥56	119	39.6	120	40	0.99	0.934
Gender	**Male**	187	62.3	161	53.6	1.43	0.032
	female	113	37.6	139	6.3		
Residence	**Urban**	243	81	277	92.3	0.35	0.000
	Rural	57	19	23	7.6		
Marital status	**Single**	31	10.3	38	2.6	0.80	0.370
	married	203	67.6	226	75.3	0.69	0.038
	*Others	66	22	36	12	2.07	0.001
Education state	**illiterate**	33	11	28	9.3	1.20	0.499
	1º and 2º school	210	70.0	197	5.6	1.22	0.256
	University	57	19	75	25	0.70	0.076
Occupation	**professional**	37	12.3	41	13.6	0.89	0.627
	Semi-professional	23	7.6	17	5.6	1.38	0.326
	non manual skilled	69	23	87	29	0.73	0.094
	manual skilled	43	14.3	32	0.6	1.40	0.175
	Partly skilled	41	13.6	16	5.3	2.81	0.000
	unskilled	87	29	117	39	0.64	0.010

* Other *marital states means widowed, divorced & separated*

Table (2) Frequency distribution of study population according to personal and familial characteristics

Personal / Familial Parameter		Cases (n = 300)		Controls (n = 300)		Odds ratio	P-value
		No.	%	No.	%		
Type of personality	A	210	70	129	43	3.09	0.000
	B	90	30	171	57		
Cigarette smoking	smoker	111	37	63	21	2.21	0.000
	non smoker	19	6.3	88	29.3	0.16	0.000
	Ex-smoker	170	56.6	149	49.6	1.33	0.086
Alcohol consumption	Drinker	26	8.6	7	2.3	3.97	0.001
	non drinker	274	91.3	293	97.6		
physical activity	Physically active	79	26.3	205	68.3	0.17	0.000
	physically inactive	221	73.6	95	31.6		
Body mass index	≤25	79	26.3	101	33.6	0.70	0.050
	26-29.9	205	68.3	188	62.6	1.29	0.144
	≥30	16	5.3	11	3.6	1.48	0.325
Past history for chronic medical problems including renal troubles	present	12	4	13	4.3	0.92	0.838
	Absent	288	96	287	95.6		
Family history for hypertension	present	256	85.3	36	12	42.67	0.000
	Absent	44	14.6	264	88		
Familial dietary pattern	excessive fatty diet	167	55.6	57	19	5.35	0.000
	little fatty diet	133	44.3	243	81		

Discussion:

A case-control study design has been adopted. The advantages of such design are better availability of cases; it needs less time and economically less expensive [14]. On the other hand, bias could occur in selection of cases and / or controls in addition no actual causation can be proved, only associations between disease and risk factors of interest can be detected [15].

About 84% of cases and controls were from the age groups above 35 years. Such result could be explained through the fact that hypertension is typically a late adulthood onset disease.

No statistically significant difference was obtained between cases and controls in regard to age. Such result can reflect the proper selection of cases and controls.

A statistically significant association for the disease was proved with male gender. Perhaps the explanation is that male individuals are usually prone to more stressful life and job events than women.

Marital states others than single and married (widowed, divorced, separated) were found carrying higher risk for disease. Such results can be explained through the physiological responses of the body towards psychological stress and emotional trauma for such problems.

Partly skilled occupation was found carrying higher risk for disease. Perhaps relatively little physical activity of such individuals is the main point behind it.

Type A personality, cigarette smoking, alcohol consumption and unhealthy dietary behaviors were found carrying high risk for the occurrence of hypertension. Such result goes with the findings of several other studies [16, 17, 18, and 19]. All can be considered among the personal characteristics that make individuals more prone to the risk of hypertension.

Physical activity and body mass index ≤25 were found having a protective effect. Such result is consistent with the findings of several other studies [16, 20, and 21].

The amount of regular physical activity plays an important role in maintaining a healthy body weight and lowering the risk of hypertension.

Positive family history for the disease was found carrying higher risk for development of hypertension. Such result goes with the finding of several other studies [22, 23, and 24].

Recommendations:

1-Care givers have to encourage hypertensive patients for essential life style changes including adopting regular physical activity , controlling , proper body weight , following a proper dietary regimen and quitting smoking and alcohol .

2-Physicians have to activate their health educational role toward hypertensive patients in

clarifying the nature of disease risk factors and its consequences.

3-Further large scale studies are recommended in future to determine all risk factors for hypertension among hypertensive patients.

References:

1-Martin SL, Mitchell SK, Adam WB, Jasmine C, Daria M, Leslie ABM. Cardiovascular diseases, Hypertension. Blue Prints in Family Medicine 1st edition USA: Black well Science; 2003(1)20: 86 – 90.

2-Tomson J, Lip YG. Blood pressure demographic nature or nature genes or environment. BMC Med 2005; 3: 3 – 4.

3-Ministry of Health, Ministry of planning. National survey for chronic non-communicable diseases risk factors in Iraq. Geneva: WHO; 2006.

4-Elliott WJ. Clinical features and management of selected hypertensive emergencies. J clin Hypertens 2004; 6(10): 587 – 592.

5-Chantal S, Everitt H, Hendrick T. Oxford Hand book of General practice. 2nd edition. Oxford, UK: Oxford, UK: Oxford University press; 2005.

6-Rashid P, Leonardi-Bee J, Bath P. Blood Pressure reduction and secondary prevention of stroke and other vascular events . Stroke 2003; 34: 2741 – 2748.

7-Rizzoni D , Poteri E , Castellano M , Bettoni G , Muiesan LM , Tiberio G . Endothelial Dysfunction in Hypertension is independent from the etiology and from vascular structure. Hypertension 2000; 31: 335 – 341.

8-Oparil S, Zaman MA, Calhoun DA. Pathogenesis of Hypertension. Ann Inter. Med 2003; 139: 762 – 775.

9-Alwan A. Prevention and management of Hypertension EMRO Technical publication series. Geneva, WHO. EMRO 1996; 23: 5 – 9.

10-Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL. The seventh report of Joint National Committee on Prevention, Detections, Evaluation, and Treatment of high Blood pressure. JNC 7th Report. JAMA 2003; 289: 2560 – 2572.

11-Bloom field P, Bradbury a Grubb NR, Newby DE. Cardiovascular disease, In: Boon NA, College NR, Walker BR, Hunter JA (editors). Davidson's Principles and Practice of Medicine. 20th edition. Edinburgh Churchill living stone; 2006.

12-Campese V, Park G. The kidney and Hypertension over 70 years of research. J nephrol 2006; 9: 691 – 698.

13-Hope RA, Longemore JM, Hodgets TJ, and Ramrakha PS. Oxford of Clinical Medicine. 7th edition UK: Oxford University press; 2007; 7: 300 – 590.

14-Altman DG, Machin D, Bryant T, Gardener MJ. Statistics with conference .2nd edition. UK: BMJ; 2000: 45 – 73.

15-Greenberg RS, Daniels SR, Flanders WD, Eley JW, Boring JR. Medical Epidemiology, 3rd edition. New York: MC Graw – Hill; 2001: 91 – 112.

16-Dhafer B. AL-Youzbaki – Sociological Backgrounds for Hypertension. Iraqi Journal of community Medicine ISSN 1684 – 5382, October – 2007; 20(4).

17-Harpham T, Stephens C. Urbanization and Health in developing countries. World health statistics quarterly, 1991; 44: 62 – 69.

18-The fifth report of the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure (JNC V). Archives of internal medicine, 1993; 153: 152 – 83.

19-Loucks LB, Berkman F, Gruenewald TL, Seeman TE. Social Integration is associated with fibrinogen concentration in elderly men. Psychosom Med, May 1, 2005; 67(3): 353 – 358.

20-National Center for Health Statistics. Anthropometric reference data and prevalence of overweight, United States, 1976 – 80. DHHS publication No. (PHS) 87 – 1688. (Vital and Health Statistics, series 11, no. 238). Washington, DC, National Center for Health Statistics, 1987.

21-Paffenbarger RS Jr, Wing AL, Hyde RT, Jung DL: Physical activity and incidence of Hypertension in college alumni. Am J Epidemiol 1983; 117: 245 – 257?

22-Ferrer RL, Palmer R, Burge S. The Family Contribution to Health Status: A Population-Level Estimate Ann. Fam. Med, March 1, 2005; 3(2): 102 – 108.

23-McEwen BS. Protective and Damaging Effects of Stress Mediators. N. Engl. J. Med., January 15, 1998; 338(3): 171 – 179.

24-Seeman TS, Crimmins E. Social Environment Effects on Health and Aging: Integrating Epidemiologic and Demographic Approaches and Perspectives. Ann. N.Y. Acad. Sci., December 1, 2001; 954(1): 88 – 117.

Lecturer / Department of Community Medicine.
College of Medicine / University of Mosul.