

Relationship between anxiety, stress, depression and hypertension in Mosul city

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Abstract

High blood pressure is a common disease in industrial and third world societies reach epidemic properties. People suffering from either depression or anxiety were two to three times more likely than the others to develop hypertension. The relationship between these negative emotions and hypertension are of a considerable public health importance. Despite the high prevalence of the two diseases has received little attention, this paper review this relationship. So the aim of the present study was to examine the role of anxiety, stress and depression symptomatology in the development of hypertension in Mosul city population by case-control study. The survey was carried out at Primary Health Care Centers (PHCCs) conducted from September 2006 to February 2007 among patients 25-65 years of age. During the study period, a total of 250 subjects, 125 cases and 125 controls, were approached. Of whom, 100 cases and 100 controls responded to the questionnaire, for a response rate of 80%. Hypertension was defined according to WHO criteria as systolic blood pressure more than 140 mmHg and/or diastolic blood pressure more than 90 mmHg. This study includes a questionnaire based on face to face interview of anxiety, stress and depression symptoms. The present study showed that sex, diabetes, obesity(BMI more than 30), physical inactivity, genetic factor, smoking habits, anxiety, stress and depression can be considered as risk factors for hypertension as discovered using multivariate analysis. Furthermore, the study suggests there is a positive correlation between hypertension and psychiatric disorders, anxiety, stress and depression.

Keywords: anxiety and hypertension, depression and hypertension, stress and hypertension, cardiovascular diseases

Introduction

Third world is facing the epidemic of cardiovascular disorders. Preventive strategies are essential to combat this epidemic. Hypertension is a major cause of morbidity and mortality in many parts of the world^{1,2}. Hypertension was defined at baseline and follow-up as systolic blood pressure more than 140 mm Hg, diastolic blood pressure more than 90 mmHg, or use of antihypertensive medication³. Sympathetic nervous system and genetic influences are the underlying mechanisms in the relationship between depression and hypertension². The physiological mechanisms underlying the relationship between depression or anxiety and BP probably involve the effect of the sympathetic nervous system. Data available at present show that sympathetic activation is a specific feature of essential hypertension, and it may play a pathogenic role in this disease. A metaanalysis showed that plasma noradrenalin, as an indirect marker of

sympathetic tone, was elevated in patients with essential hypertension². Other risk factors such as nutritional problems, behavioral factors and unhealthy lifestyle also influence the prevalence of hypertension^{4,5}. Depression, stress and anxiety are the most prevalent disorders in many populations and are the considerable factors causing hypertension and distress to the patients⁵ which could be managed by early detection and treatment at the primary health center level.

Several self rating scales have been created to assess symptoms of depression and anxiety separately^{6,7}. As these conditions often coexist, it has been considered reasonable to use rating instruments that encompass both anxiety and depression simultaneously.

The aim of the present study was to examine the role of anxiety, stress and depression symptomatology in the development of hypertension in Mosul population.

Subjects and Methods

In order to achieve the objectives of the study the investigator use case-control study design to determine the relationship between hyper-tension and anxiety, stress and depression risk factors and their association with socio-demographic, behavioral and lifestyle characteristics among adult Mosul population.

The questionnaire is consisting of two parts: Information related to socio-demographic data of the sample and information related to psychological problems of patient two instruments are used in the study: The Depression Anxiety Stress Scales⁶ and ICD 10 Checklists⁷. The validity of these scales at PHCCs was re-tested in the present study. Opinions of two physicians and four psychiatrists about the questionnaire were taken and their acceptance was received.

Persons were classified as hypertensive if both of their measurement of systolic blood pressure > 140 mm Hg or diastolic blood pressure > 90 mm Hg or if they were currently taking antihypertensive medication³. A total number of 125 hypertensive patient aged 25-65 years selected by simple randomly process from PHC centers in the period from September 2006 to February 2007.

Control subjects aged 25-65 years were identified from the community as being healthy if both their results of systolic blood pressure < 140 mm Hg or diastolic blood pressure < 90 mm Hg or if they were currently not taking antihypertensive medication. This community survey involved a random sample of 125 subjects from PHC centers.

A multistage stratified cluster sampling design was developed using Mosul Primary Health Center clinics. Informed consent was obtained from each person who agrees to participate in the study. During the study period, a total of 250 subjects, 125 cases and 125 controls were approached. Of whom, 100 cases and 100 controls agreed to participate in the study, a response rate of 80%.

The participants were interviewed by investigator himself and completed the instruments. Participants were classified as physically inactive if they reported not

participating in walking, cycling or jogging for at least 30 minute/day.

Univariate and multivariate logistic regression analysis was used to predict potential risk factors (determinant) for hypertension. Logistic regression results are reported as odd ratios and 95% confidence intervals along with P values. The spearman rank correlation coefficient was used to evaluate the strength association between variables. The level $P < 0.05$ was taken as the cut off value for significance.

Results:

During the two months period spend on data collection (250) persons were included. Table (1) portrays the demographic characteristic of the study population. Almost (47%) were cases 25-45 years of age and (37%) were control. Regarding sex distribution the same table depicts that male in cases and control were (50% and 68% respectively). About the education of both cases and control, the result showed that more than quarters of cases are primary educational certificates compared to more than one sixth of control. It is appear that diabetes represent the majority of cases (64%), compared to (17%) of control. With regard to the BMI, appears that the majority of cases sample (66%) were overweight, while the high percentage of control sample (84%) with normal weight. The table also indicate that more than half of cases were smoker (63%), compared with almost one sixth of control (17%). The same table depicts that for each one control there are 3.9 cases has physical inactivity. Regarding genetic factor majority of cases had positive family history of hypertension (67%), while majority of control had no that family history (81%). With regard to psychiatric disorders first was anxiety about two third of cases had this disorder (59%) compared with one fifth of control (20%). About stress two third had stress (60%), and one fifth of control (20%). Finally the table indicate that (70%) of cases suffering from depression and (23%) on control.

In table (2) the study showed that sex, diabetes, obesity (BMI more than 30), smoking habit, physical inactivity, genetic factor, anxiety, stress and depression are

considered as risk factors for hypertension confirmed by multivariate analysis.

Furthermore the study suggests that there is a positive correlation between hypertension and psychiatric disorders in the form of anxiety ($r=0.4, P=0.001$), stress ($r=0.41, P=0.001$) and depression ($r=0.47, P=0.001$).

Discussion:

Nothing is known about the morbidity of hypertension with psychiatric disorders per unit population in our country, since neither a regional nor the national register of these cases exists. What is taken for granted in Iraq could be assumed neither in western countries, higher income countries and more developed countries nor in other developing countries, because of impact of wars, embargo and disasters. Thus, the findings of the present study may differ if it is compared with other findings taken in another period of time or another place. Therefore, the figure of positive association between hypertension and psychiatric disorders in this study which could be quite helpful indicator of the problem of psychiatric disorders in Mosul City. The mental health is influenced by displacement through war and catastrophe; by stresses on families, economic adversity, the limitation of rights affording the access of education and health, and by the women in the society who must manage their children. The burden of serious emotional and behavioral disorders afflicts their lives⁸. All these factors are present in Iraqi society. Furthermore, this may help in planning a preventive strategy to reduce the adverse outcomes of psychiatric disorders suggests the possibility of prevention, if factors that are amenable to change can be identified and dealt with.

Many researchers believe that the epidemic of hypertension and heart disease in the western world is a direct result of this stress^{4,5,10}. There is a considerable amount of data linking sympathetic nervous system hyperresponsivity to the development of hypertension². Studies on psychiatric disorders in hypertensive patient have led to inconclusive results. While some investigators reported negative associations between hypertension and psychiatric disorders namely anxiety, stress and

depression other showed positive association Bener et al, and Jonas et al study's revealed that psychiatric disorders have positive association with hypertension^{9,5}. It is generally accepted that an increased risk of psychiatric morbidity is related to hypertension¹⁰. The present study showed significantly higher psychiatric morbidity among hypertensive group than in normotensive healthy one. Despite the importance of genetic component in the causation of essential hypertension² increase blood pressure has been associated with chronic environmental stress including employment and lifestyle⁹. This is consistent with the present reported study.

Our results regarding the association between hypertension and psychiatric disorders in Mosul are alarming so it needs to define more effective and specific strategies to screen for and control hypertension and cardiovascular disease.

As a conclusion; the present study suggests that anxiety, stress and depression are related to hypertension.

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Table (1): Socio-demographic and psychological factors of the studied groups

Characteristics	Cases (n=100)	Control (n=100)
	No.	No.
Age (year)		
25-45	47	37
46-65	53	63
Sex		
Female	50	32
Male	50	68
Level of education		
No formal edu.	19	34
Primary	28	15
Intermediate	26	8
Secondary	18	14
University	9	29
Diabetes Mellitus		
Present	64	17
Absent	36	83
BMI		
Overweight	66	16
Normal weight	34	84
Smoking habit		
Smoker	63	17
Non-smoker	37	83
Physical inactivity		
Present	71	18
Absent	29	82
Genetic		
Present	67	19
Absent	33	81
Anxiety		
Present	59	20
Absent	41	80
Stress		
Present	60	20
Absent	40	80
Depression		
Present	70	23
Absent	30	77

Table (2): Univariate and multivariate analysis of hypertension with socio-demographic and psychological factors

Variables	Univariate			Multivariate		
	OR	95% C.I.	p-value	OR	95% C.I.	p-value
Age	0.66	0.38-1.17	0.15 (NS)	0.77	0.22 ± 2.76	0.692 (NS)
Sex	2.13	1.20-3.78	0.01	3.17	0.83 ± 12.07	0.091
Diabetes mellitus	8.68	4.48-16.84	<0.001	9.69	2.44 ± 38.49	0.001
BMI	10.19	5.18-20.04	<0.001	5.73	1.71 ± 19.2	0.005
Smoking	8.31	4.29-16.10	<0.001	4.30	1.07 ± 17.27	0.04
Physical inactivity	11.15	5.72-21.76	<0.001	5.69	1.69 ± 19.21	0.005
Genetic	8.66	4.52-16.59	<0.001	13.83	3.80 ± 50.30	<0.001
Anxiety	5.76	3.06-10.83	<0.001	5.15	1.41 ± 18.88	0.013
Stress	6.00	3.19-11.30	<0.001	9.54	2.71 ± 33.64	<0.001
Depression	7.81	4.15-14.70	<0.001	4.98	1.56 ± 15.93	0.007