Hypertension in Nassiryia City: Extent and determinants of its control

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ABSTRACT

Background: Uncontrolled hypertension is a major concern among hypertensive patients. It may be caused by various factors such as inadequate knowledge and inappropriate attitude, unhealthy lifestyle, and ineffective treatment.

Objectives: To estimate the prevalence and determinants of controlled hypertension status among adults in Nassiriyah city.

Design, Setting, and Participants: A cross sectional household survey was carried out in Thi-Qar Governorate, Southern Iraq, on 2148 adults (410 of them were known cases of hypertension) from two areas in Nassiriyah city, aged 18 years and above, recruited between 1st of November 2012 and 31st of October 2014 using multistage sampling.

Main Outcomes and Measures: Controlled hypertensive patient was defined as an individual with self-reported treated hypertension with blood pressure measurements of less than 140/90 mmHg. Determinants were measured using a questionnaire -based interviewing.

Results: The overall prevalence of hypertension was 26.5% (19.1% were known hypertensives and 7.4% were unrecognized hypertensives).Of the recognized hypertensives, only 35.4% (95% CI 31.0%-39.8%) were with controlled blood pressure. The uncontrolled hypertension subcategorized into those of isolated systolic and isolated diastolic blood pressure with a prevalence of 6.8% and 4.0% respectively. Significant independent association was found between control of hypertension and age, occupation, BMI, educational level, feeling of irritability, family history of hypertension, physical inactivity, drug intake and type of drinking water.

Conclusion: The prevalence of uncontrolled hypertension in Thi-Qar Governorate was high. This necessitates effective preventive and control measures.

Key words: Control, Hypertension, Prevalence, Determinants, Thi-Qar

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INTRODUCTION

Control of hypertension is defined as the achievement of blood pressure below 140/90 mmHg in individuals being treated for hypertension. [1] While uncontrolled hypertension was defined as an average SBP ≥140 mmHg or an average DBP ≥90 mmHg, among those with hypertension. [2]

Despite considerable improvements in increasing awareness, effective treatment and lifestyle interventions, many studies reported that a high proportion of patients with hypertension did not have their blood pressure under control. [3,4]

Among adults with hypertension in United States in 2009-2010, 46.7% did not have their blood pressure under control.[5] While a study in Ughanda (2013) showed that only 9.4% of the hypertensive participants had controlled blood pressure. [6]

In Thi-Qar Province South of Iraq, a study done in 2012 on attendants of some primary health care centers in Nassiriyah city showed that 46.1% of the study population were hypertensives, only 17.7% of them achieved controlled blood pressure.[7]

Many factors contribute to uncontrolled blood pressure. Most of these factors relate to the patients such as non-compliance and medication side effects [8], while others relate to health care providers such as availability barriers including lack of resources and time work overload. [9] These factors may be modifiable or non-modifiable. Non-modifiable factors include age, gender, ethnicity and family history. Modifiable factors include compliance, access to health care, life style, and co-morbid conditions such diabetes mellitus and kidney diseases. [10-12]

Despite the reported high prevalence of hypertension in Nassiriyah City [7], information on control of hypertension are needed for planning and application of effective treatment and control strategies.

SUBJECTS AND METHODS

This study is a part of comprehensive household survey that had been done in Nassiriyah City during the period from the1st of November 2012 to 31st October of 2014 using multistage sampling including adults (aged ≥18 years) of the catchment population of nine Primary Health Care Centers. Details on the methodology are found elsewhere.[13]

RESULTS

Out of the total known hypertensive patients, about two thirds 265/410 (64.6%) had uncontrolled hypertension (Figure 1).

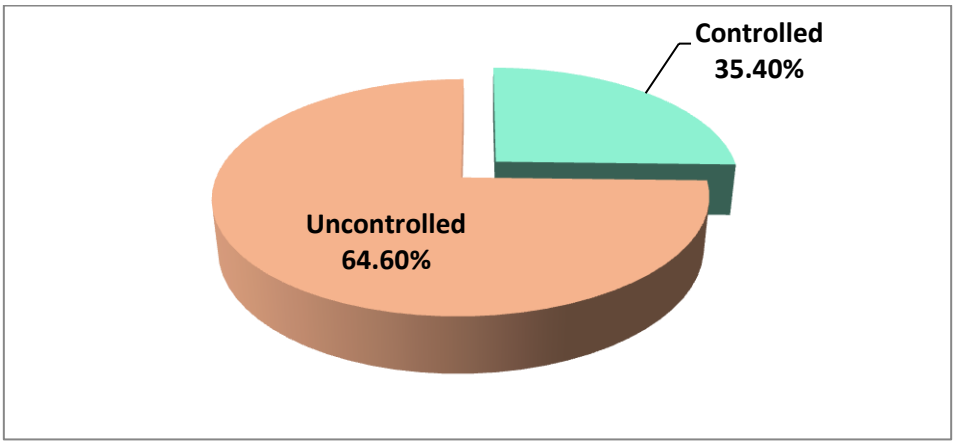

Figure 1: Proportion of controlled hypertension

As shown in Figure 2, the isolated systolic hypertension represents the most common subtype of hypertension among the uncontrolled hypertensive patients.

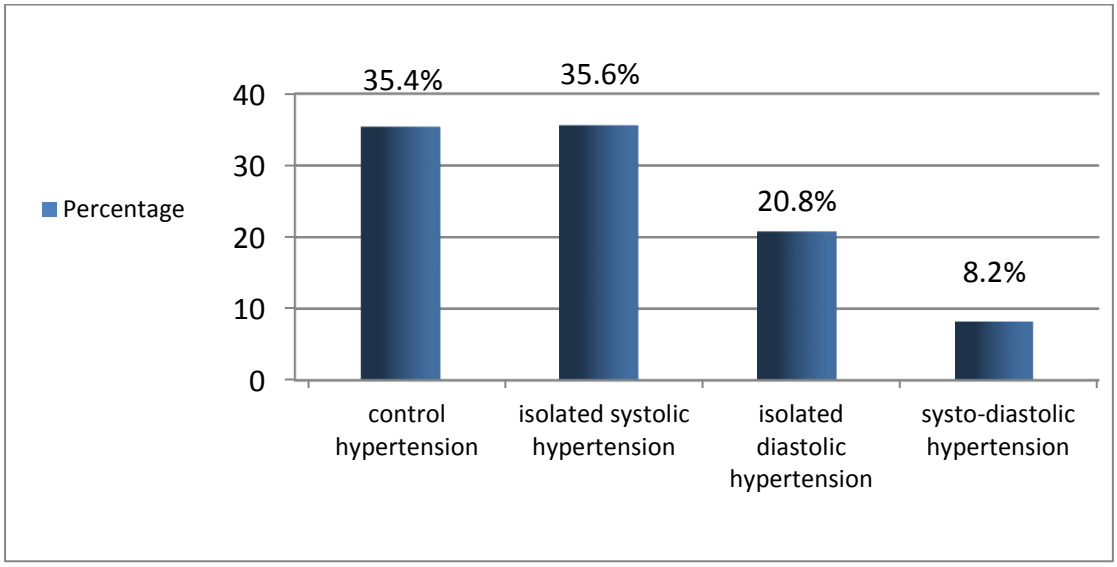

Figure 2: Distribution of the hypertensives according to hypertension subtypes

As shown in Table 1, the proportion of controlled hypertension was significantly more among young patients than in elderly people. Highly educated people showed a lower rate of controlled BP compared to those with lower educational level. Unmarried people, employed patients and those with high socio-economic status had better controlled their blood pressure in comparison with married or divorced people and those with low socio-economic status, and unemployed and retired patients.

Table1: Association of control of hypertension withsocio-demographic characteristics

Variable	Controlled hypertension No.	%	Uncontrolled hypertension No.	%	Total No.	%	X^2, P value
Age							
18-24	11	61.1	7	38.9	18	100.0	32.819, <0.001
25-34	9	40.9	13	59.1	22	100.0	
35-44	19	38.8	30	61.2	49	100.0	
45-54	64	49.2	66	50.8	130	100.0	
55-64	29	25.0	87	75.0	116	100.0	
>65	13	17.3	62	82.7	75	100.0	
Sex							
Male	71	35.7	128	64.3	199	100.0	0.017, 0.898
Female	74	35.1	137	64.9	211	100.0	
Educational level							
Primary	67	34.7	126	65.3	193	100.0	4.613. 0.039
Secondary	36	45.0	44	55.0	80	100.0	
Basic college and above	42	30.7	95	69.3	137	100.0	
Marital status							
Married	120	5.6	217	64.4	337	100.0	21.671, 0.017
Unmarried	18	69.2	8	30.8	26	100.0	
Divorced and widows	7	14.9	40	85.1	47	100.0	
Occupation							
Employed	50	40.3	74	59.7	124	100.0	17.337, < 0.001
Unemployed	88	38.9	138	61.1	226	100.0	
Retired	7	11.7	53	88.3	53	100.0	
Family history of hypertension							
Positive	81	32.4	169	67.6	250	100.0	2.465, 0.116
Negative	64	40.0	96	60.0	160	100.0	
Per capita monthly income (x 1000 ID)							
<100	42	32.1	89	67.9	131	100.0	0.960, 0.350
100-250	31	37.8	51	62.2	82	100.0	
>250	72	36.5	125	63.5	197	100.0	
Type of Family							
Nuclear	91	43.3	119	56.7	210	100.0	11.956, < 0.001
Extended	54	27.0	146	73.0	200	100.0	
Socio-economic status							
Poor	13	24.1	41	75.9	54	100.0	11.144, < 0.001
Moderate	94	33.5	187	66.5	281	100.0	
High	38	50.7	37	49.3	75	100.0	
Total	**145**	**100.0**	**265**	**100.0**	**410**	**100.0**	

As shown in Table 2, diabetic patients showed lower rate of blood pressure control than non-diabetics but without significant association. The prevalence of BP control was significantly higher among patients without renal diseases compared to those with positive history of renal diseases.

Table 2 Distribution of control hypertension according to co-morbid conditions

Co-morbid conditions	Controlled hypertension No.	%	Uncontrolled hypertension No.	%	Total No.	%	X^2, P value
Diabetes Mellitus							
Yes	25	28.1	64	71.9	89	100.0	2.633, 0.105
No	120	37.4	201	62.6	321	100.0	
Renal diseases							
Yes	9	21.4	33	78.6	42	100.0	3.976, 0. 046
No	136	37.0	232	63.0	368	100.0	
Total	145	35.4	265	64.6	410	100.0	

As shown in table 3, patients who were active whether on regular or irregular physical activity had significantly better control of blood pressure compared to those who were inactive. Stressed patients and those who drunk RO water also showed a high rate of blood pressure control.

Table 3:Distribution according to behavioral risk factors

Variable	Controlled hypertension No.	%	Uncontrolled hypertension No.	%	Total No.	%	X^2, P value
Physical activity							
Regular	36	51.4	34	48.6	70	100.0	15.245, <0.001
Irregular	66	38.2	107	61.8	173	100.0	
Non active	43	25.7	124	74.3	167	100.0	
Smoking status							
Current	29	37.7	48	62.3	77	100.0	2.381, 0.304
Ex-smoker	22	44.0	28	56.0	50	100.0	
Non-smoker	94	33.2	189	66.8	283	100.0	
Stress							
No	107	41.2	153	58.8	260	100.0	10.415, 0.001
Yes	38	25.3	112	74.7	150	100.0	
Type of drinking water							
RO	139	39.0	217	61.0	356	100.0	16.724, <0.001
Bottle	3	20.0	12	80.0	15	100.0	
Tap	3	7.7	36	92.3	39	100.0	
Drugs intake							
No	63	31.2	139	68.8	202	100.0	3.040, 0.081

Yes	82	39.4	126	60.6	208	100.0	
Body mass index (Kg/m^2)							
< 25	18	27.7	47	72.3	65	100.0	2.430, 0.297
25 - 29.9	82	38.1	133	61.9	215	100.0	
≥ 30	45	34.6	85	65.4	130	100.0	
Total	145	35.4	265	64.6	410	100.0	

On logistic regression analysis, the variables which showed independent significant association with uncontrolled status of hypertension were advanced age, higher educational level, occupation, extended type of family, family history of hypertension, physical inactivity, stress, and tap drinking water. While current use of other drugs was associated with reduced the risk of uncontrolled hypertension. [Table 4]

Table 4: Logistic regression of the determinants of the control hypertension

Status	Variables	β	P- value	Expected B	95% C.I. for EXP(B)	
					Lower	Upper
Significant	Educational Status	0.512	0.001	1.669	1.218	2.287
	Occupation	0.634	0.006	1.884	1.197	2.966
	Type of family	0.744	0.002	2.105	1.301	3.406
	BMI	0.376	0.021	1.457	1.058	2.007
	Physical activity	0.592	0.000	1.808	1.301	2.511
	Family history of HT	0.636	0.010	1.891	1.161	3.067
	Stress	0.719	0.006	2.053	1.226	3.439
	Drinking water	0.735	0.012	2.085	1.173	3.703
	Drug intake	-0.732	0.005	0.481	0.290	0.798
	Age	0.390	0.000	1.477	1.206	1.809
Non-significant		Smoking Socio-economic status				
Excluded variables		Sex, marital status, income, history of diabetes mellitus, and history of renal diseases.				

DISCUSSION

A worrying global trend is that very low levels for control of hypertension are widespread in both low and high income countries. [14 - 16] In a systematic review from 35 countries, the authors reported no significant differences between developed and developing countries in hypertension indices. In terms of control among all hypertensive patients, 10.8% of the men had adequate control in developed countries compared to 9.8% in developing countries.[14]Among women only 17.3% of all people with hypertension achieved control compared to 16.2% in low income countries.[14]

Although the prevalence of hypertension in Nassiriyah City was high and almost all diagnosed hypertensive patients in this study were on treatment, only 35.4% had blood pressure that was well controlled. This reflects the high risk of developing complications among the hypertensive patients despite being on treatment. Similar findings of low control rate of hypertension were reported in Turkey in a general population where more than half of the hypertensive participants (54.5%) were being treated for hypertension but only 24.3% of those had adequate control of the blood pressure [17], in Saudi Arabia (37%) [18], China (11.8) [19], Romania (19.88%) [20], India (6.6%)[21], and Iran (20.9%). [22]

Such poor control of hypertension may be either due to poor quality and insufficient quantity of health care services [23], or may be due to patient-related factors such as poor compliance represented by low uptake of pharmacological and non-pharmacological measures such as salt intake reduction, losing weight and physical activity, access to health, and presence of other co-morbid conditions. [24] Socio-economic status was the main determinant of controlling status.[25, 26]

Hypertension control can be challenging to achieve, with barriers to hypertension control attributed to patients, healthcare providers, healthcare systems, and the silent nature of the disease.[27] In USA, the prevalence of uncontrolled hypertension was 16.6%. [28]

This study showed that blood pressure control was significantly associated with younger age, secondary and low educational level, high socio-economic status and physical activity, a result which agrees with that of others. [18, 29- 31]

Younger people are expected to have good control of hypertension because they usually suffer less co-morbid condition compared to elderly people.[18] In addition, age was reported to be greatly associated with systolic blood pressure [32], and isolated systolic hypertension was found to form the higher proportion of uncontrolled hypertensive patient in this study, a result which is consistent with that reported by others. [33] Physical activity was reported to be a non-pharmacological type of treatment, in addition active people usually adopt a healthy life style habits and tend to be non-smokers or are able to quit smoking.[18, 34] Individuals who exercise are less likely to smoke, and engaging in exercise may be able to help smokers quit.[34, 35]

This study showed no significant relation between sex and control of hypertension. The data about the association between sex and blood pressure control are conflicting. Some studies showed that women are more concerned about their health and had better health seeking behavior [36] and they were more aware about their hypertension than men [37], therefore they showed better control of hypertension. However, other studies [38, 39] reported no sex differences. A large meta-analyses of hypertension treatment trials have failed to document gender differences in response to antihypertensive medication meaning that if gender difference in control of hypertension was documented it would be probably due to socio-economic and cultural factors [40].

Patients with family history of hypertension showed poor blood pressure control, a result which agree with that of others.[41] The genetic predisposition of hypertension [42, 43] may interfere with control of blood pressure.

On multivariate analysis, body mass index was found to be an independent risk factor for uncontrolled hypertension (OR, 1.46;95% CI 1.06 - 2.01; P= 0.021). A result which is consistent with that reported by Gharipour et al [24]. Obesity is commonly associated with severe hypertension and more likely not to achieve good blood pressure control. [44] Obesity was found to affect control of blood pressure because it increases insulin resistance, increased thickness of blood pressure and release of aldosterone and renin. [46]

In this study stress was found to be significantly associated with poor control of hypertension, a result which is in agreement with that reported by Sanz J et al. [(47)] It was reported that long term stress leads to arteriolar sensitization to catecholamines resulting in vascular constriction and endothelial damage. [(48)]

In this study, diabetes mellitus was not found to be related to control of hypertension, a result which disagrees with that reported by others. [22,45]

Diabetes mellitus was reported to be associated with poor control of hypertension [47, 48] partly due to the influence of dyslipidemia which is associated with diabetes mellitus . [49]

Patients who were on current use of other drugs were found to have lower risk of uncontrolled hypertension, a result which is consistent with that of Degli Esposti et al [49] who explained such phenomenon by that patients on other drugs become more accustomed and keen about their treatment and hence taking higher doses of the drugs and this may control their hypertension in a good way.

It is worth mentioning that a high proportion of uncontrolled hypertensive patients were with isolated systolic hypertension. The prevalence of isolated uncontrolled SBP was twice as high as that of isolated uncontrolled DBP. A similar phenomenon was reported in a study in the USA, where the percentages of patients with uncontrolled SBP and DBP were 32.7% and 82.9% respectively.[50, 51]

CONCLUSION

Uncontrolled hypertension is highly prevalent among hypertensive patients in Nassiriyah City. Blood pressure control had been influenced, significantly, by many factors including age, education, BMI, physical activity and others.

Innovative strategies and efforts to improve the management of hypertension are needed, including the appropriate use of antihypertensive drugs and the intervention of factors associated with uncontrolled hypertension particularly those related to lifestyle such as obesity and physical activity.

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