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Uncontrolled Hypertension among Treated Hypertensive Patients

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Abstract

Objectives: To determine the prevalence of uncontrolled hypertension among Yemeni hypertensive patients on treatment.

Methods: Cross sectional study was conducted among hypertensive adult patients presented to a private cardiac center in Sana'a from January to December 2016. All adult patients diagnosed to have hypertension for at least 3 months prior to the interview were included in this study. Each patient was clinically examined by training doctor on arrival to clinic and then every 3 months. The examination included; personal history, blood pressure, and through cardiovascular examination and recorded. Demographic data, special habits, body mass index, medication used and other laboratory data were registered. Collected data was coded and enter into Pc for statistical analysis.

Results: The total number of patient with hypertension (HTN) presented into Cardiac Centre were 277. Of them 187 (67.5%) Were males and 90 (32.5%) were females, their age was ranged from 27 to 100 year with mean age of 57.5 ± 12.3.

61 patients (22.0%) had stage I hypertension (HTN) and stage II (HTN) was found in 182 Patients (65.7%). Of the total cases target BP controlled was achieved in 34 patients (12.3%). Several risk factors have been significantly associated with uncontrolled hypertension and these were; ischemic heart disease, elder age, left ventricular hypertrophy and renal impairment. There were no significant association between uncontrolled hypertension and other variables (Gender, Qat chewing, BMI, duration of hypertension and associated disease as diabetes mellitus, Cerebrovascular accident, medications & blood cholesterol level).

Conclusion: Prevalence of uncontrolled hypertension was high in individuals with concomitant hypertension and comorbidity factors. IHD, renal impairment aging and left ventricular hypertrophy are the most important determinants of uncontrolled hypertension.

Keywords: Uncontrolled hypertension, Comorbidity diseases, Yemen.

Abbreviations: SBP-Systolic Blood Pressure, DBP-Diastolic Blood Pressure, ACEI-Angiotensin Converting Enzyme Inhibitor, CCB-Calcium Channel Blocker, BB-Beta Blocker.

Introduction

Hypertension is a prevalent predictor of cardiovascular problems and considers a leading risk factor for mortality worldwide especially in low- and middle-income countries [1]. It is estimated to have caused 9.4 million deaths and 7% of disease burden-as measured in DALYs-in 2010 [2]. According to WHO, the global prevalence of hypertension in 2014 among adults aged≥18 years was around 22% with the highest prevalence was in Africa 30% and the lowest was in the Region of the Americas 18%. Males had slightly higher prevalence of hypertension than females [2].

Approximately one billion persons are living with uncontrolled hypertension worldwide [3]. In spite of intensive medical treatment, hypertension often remains uncontrolled in general practice. Uncontrolled hypertension is the major cause of heart failure in females and numbers two of most common cause heart failure in males [4]. It accounts for 40% of deaths from ischemic heart disease and 51% of all stroke deaths worldwide [4,5]. Uncontrolled hypertension can also cause myocardial infarction, stroke, congestive heart failure, end-Stage renal disease, peripheral vascular disease, and retinal blood vessels damage [4-7].

Control of hypertension is associated with low probability of hypertension's complication. A drop in systolic blood pressure of 10 mmHg is associated with 22% drooping in coronary heart disease, 41% drooping in stroke [8], and a 41-46% drooping in cardio metabolic mortality [9]. The prevalence of controlled hypertension differs from one country to another. It was reported in 6.6% of the hypertensive cases in India [10], 11.8% in China [11], 19.9% in Romania [12], 15.8% in Iran [13] and 37% in Saudi Arabia [14], 52.5% in Panama [15] and 46.5% in United States [16].

There are many reported risk factors related to poor BP control; cigarette smoking, bad socio-economic status, lifestyle, male sex, old

age obesity and poor compliance to antihypertensive drugs [11,17,18]. Non-adherence to anti-hypertensive influences its effectiveness and increase the possibility of uncontrolled hypertension and the subsequent complications such as stroke and ischemic heart diseases [18]. Presence of co-morbidities and intake of less aggressive treatment were significant barriers of controlling blood pressure [19]. The aim of the study was to determine the prevalence of uncontrolled hypertension among adult Yemeni patients and to identify the associated risk factors.

Patients and Methods

This cross-sectional study involved adult patients consecutively presented to Cardiac Centre (CC) in Sana'a with uncontrolled hypertension during 2016. This center serves large number of population from all areas of the Republic of Yemen. Uncontrolled hypertension is defined as an average systolic blood pressure ≥140 mmHg or an average diastolic blood pressure ≥90 mmHg, among those who are under anti-hypertensive treatment. Inclusion and Exclusion Criteria. All patients aged 18 year or more who diagnosed as having hypertension for at least three months prior to attending to the Centre and he/she under treatment were included in this study. Newly diagnosed patients who have been taking antihypertensive treatment for less than one month were excluded from the study.

All patients were subjected to through clinical examination including; blood pressure measurement, laboratory investigations such as hemoglobin, serum creatinine, serum electrolytes lipid profile ECG and echocardiogram. Other data such as age, sex, special habits, and duration of hypertension, type of treatment and weight and height were enquired about and recorded. We asked patient to come after 3 months for follow up and investigation was repeated.

Definition: We considered control hyper tension if: Systolic 120-139 mm Hg, diastolic 80-89 mm Hg.
Stage 1: Hyper tension if Systolic 140-159 mm Hg, diastolic 90-99 mm Hg.
Stage 2: Hyper tension if Systolic 160 mm Hg or greater, diastolic 100 mm Hg or greater.

Data Analysis: All data was coded entered in to PC. And analyzed by SPSS program version 22. Frequency (%) was used to describe the qualitative variables. Quantitative variables were described by mean and standard deviation as the data were normally distributed. Chi-square (Chi-square and Chi-square with Yate correction) tests were used to show the significant of association between the outcome and other independent variables. P-values of <0.05 were considered significant.

Ethical Consideration: Permission to conduct this study was granted by Arab Board of Medical in particular the Research Committee.

Results

A total number of hypertensive patients participated in this study was 277. There were 187 (67.5%) males and 90 (32.5%) females. Age of the patients ranged from 27 to 100 year and main age 57.5 year ± 12.3. The general characters of the patients are illustrated in **Table 1**.

Among the total patients, 31 (11.2%) were current smokers and 176 (63.5%) were Qat (Chat) chewers. Body mass index in 144 (52%) patients, either they were overweight 91(32,9%) or found to be obese 53(19.1%).

Uncontrolled blood pressure were found in 243 patients of them 61 patients(22.0%) had stage I hypertension (HTN) and 182 Patients(65.7%) were in stage II (HTN). The pattern of uncontrolled hyper tension is shown in **Table 2**.

Variable			NO.	%
Age (year)	**Main**	±		
	57.5	12.3		
Gender				
· Male			187	67.5
· Female			90	32.5
Smoking				
· Yes			31	11.2
· No			231	83.4
· Ex			15	5.4
Qat chewing				
· Yes			176	63.5
· No			93	33.6
· Ex			8	2.9
BMI (kg/m2)				
· Underweight			4	1.4
· Normal			129	46.6
· Obesity			53	19.1

Table 1: General characteristics of the patients presented with hypertension (n=277).

Blood pressure		Freq.	%
Stage			
	Stage 1 (SBP≥140<160) (DBP≥ 90 - <100)	61	22
	Stage 2 (SBP ≥160) (DBP≥100)	182	65.7
	Controlled hypertension	34	12.3
Pattern			
	High SBP/High DBP	202	72.9
	High SBP/Normal or low DBP	31	11.2
	High DBP/Normal or low SBP	10	3.6
	Normal hypertension controlled	34	12.3

Table 2: Stages and pattern of uncontrolled hypertension among study patients (243).

In this study, the prevalence of uncontrolled hypertension was 243 (87.7%). Most of the hypertensive patients in this study took combined antihypertensive drugs 124 (51.0%), the combination either two drugs which represented 93 (38.3%) or more than two drugs 31 (12.7%). However, 119 cases were used one drug only **Table 3**.

Those patients who achieved target BP (<140/90 mmHg) were 34 (12.3 %) Patients. Of whom 18 patients (53.0%) were under 2 medications & 16(47. 0%) on mono-therapy. The most common combined therapy were ACEI + Diuretic and the most common prescribed mono-therapy was ACEI then Beta blocker drugs in both groups. The classes of antihypertensive agents had no influence on the blood pressure controlled.

Associated comorbidity and risk factors with uncontrolled hypertension patients is shown in **Table 4.** Elder patients with age more than 65 years, IHD, LVH, high creatinine level, found to be significant risk factors for uncontrolled hyper tension with P value (0.031, 0.015, 0.010 and 0.041) respectively.

There were no significant association between uncontrolled hypertension and other variables (gender, Qat chewing, BMI, duration of hypertension, associated diseases, DM, CVA, medication and blood cholesterol level as shown in Table 4.

Variables	Uncontrolled HTN 243	P-value
Number of drugs		0.061
1	119 (49.0%)	
2	93 (38.3%)	
≥ 3	31 (12.7%)	
Classes of drugs (One drug only)		0.074
ACEI	46 (38.7%)	
Diuretic	06 (05.0%)	
ARB	12 (10.1%)	
Beta Blocker	32 (26.9%)	
CCB	23 (19.3%)	
Combination two drugs (93)		0.528
Diuretic +one of other drugs	57(61.3%)	
ACEI +BB.	36 (38.7%)	
Thiazide + ACEIs + Ca-Blockers 0r any combinations	31(19.3 %)	

Table 3: Distribution of uncontrolled hypertensive patients by antihypertensive drugs.

Variable		Uncontrolled		Controlled		p-value
		Freq.	%	Freq.	%	
Age (year)						0.031
	<65	163	84.9	29	15.1	
	≥ 65	80	94.1	5	5.9	
Gender						0.709
	Male	165	88.2	22	11.8	
	Female	78	86.7	12	13.3	
Smoking						0.032
	Yes	23	74.2	8	25.8	
	No	220	89.4	26	10.6	
Qat chewing						0.362
	Yes	152	86.4	24	13.6	
	No	91	90.1	10	9.9	
BMI						0.394
	Underweight/Normal	119	89.5	14	10.5	
	Overweight/Obesity	124	86.1	20	13.9	
Duration of hypertension/year						0.862
	<10	203	87.9	28	12.1	
	≥ 10	40	87	6	13	
Associated diseases						
IHD						0.015
	Yes	16	69.6	7	30.4	
	No	227	89.4	27	10.6	
DM						0.113
	Yes	49	94.2	3	5.8	
	No	194	86.2	31	13.8	
CVA						1
	Yes	13	86.7	2	13.3	
	No	230	87.8	32	12.2	
Medication						0.834
	Single	119	88.1	16	11.9	
	Combination	124	87.3	18	12.7	
LVH						0.01
	Yes	193	89.4	23	10.6	
	No	22	71	9	29	
Creatinine						0.041
	High	112	91.8	10	8.2	
	Normal	121	83.4	24	16.6	
Cholesterol						1
	Hypercholesterolemia	4	80	1	20	
	Normal	194	89	24	11	

Table 4: Association between comorbidity and risk factors with uncontrolled hypertension patients.

Discussion

In this study we found that, only 34 (12.3 %) of patients their blood pressure have been controlled and achieved target BP (<140/90 mmHg). This figure was less than the previous reported from neighbors countries such as Oman, Saudi Arabia & Bahrain, they reported ((39%), 25% and 16.5%) respectively [20-22]. Globally hypertension control rates vary from one country to another ranging as low as 5.4% in Korea to as high as 58% in Barbados which clearly demonstrate the world wide difficulty in achieving satisfactory blood pressure control [23].

There are numerous potential reasons for low rates of BP control in our patients among these could be, poor access to health care, unaffordable to pay medications & lack of adherence with long term therapy for a condition that is usually asymptomatic [24]. Moreover, the immediate benefit of the therapy may be not obvious to the patients and make patient redundant to continue with drugs. Other reason the drug may interferers with the patient's quality of life.

Our study the majority (87%) of hypertensive patients failed to reach the targeted BP goals and exposed patients to the risk of heart attack, strokes and other hypertension related disease with consequent impact on morbidity and mortality [25]. Wong et al(2003),estimated that control of hypertension to levels recommended by the JNC could prevent 19-50% to coronary heart disease events in men and 31-57% of coronary heart disease events in women depending on the BP achieved [26]. So that, substantial number of cardiovascular events can be prevented by improving BP control.

Despite that most of our patients were taking 2 or more medications and their counterpart were taking mono-therapy, the controlled blood pressure in both groups had no significant difference. This finding seem to be contradicted with what was concluded by major clinical trial that effective BP control is better achieved with 2 or more antihypertensive medications for most patients [27,28]. Reality our patients who were under two medications were most of them had left ventricular hypertrophy which may reflect longstanding uncontrolled hypertension or other comorbidity diseases which may play negative role in controlling blood pressure.

In this study we found positive association between left ventricular hypertrophy, renal impairment and uncontrolled hypertension, this result coincide with reports from other studies [29]. However, ischemic heart disease was found to be relatively associated with better BP control, such a positive effect was observed by other studies as well [30,31]. This result might be explained by better compliance in those patients or more aggressive treatment they received.

Conclusion

Hypertension was not adequately controlled in the majority of the treated patients. Comorbidity diseases such as renal impairment, left ventricular hypertrophy and ageing found to be associated factors for uncontrolled hyper tension.

Recommendation

1. Further effort is needed from attendant physicians to explain the major complications of uncontrolled hypertension to the patient & his family to support the patient compliance to his medications.
2. Country wide study is needed to identify those patients with uncontrolled hypertension and to develop National hypertension control program.

Limitations

Important limitation in our study were difficulty in convincing the patient for regular follow up and recurrent visit because significant number of patient were coming from outside Sana a city.

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References

1. Narayan KV, Ali MK and Koplan JP. Global non-communicable diseases-where worlds meet (2010) N Engl J Med 363: 1196-1198. https://doi.org/10.1056/NEJMp1002024
2. Global status report on non-communicable diseases (2014) World Health Organization.
3. European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC) (2013) Eur Heart J 34: 2159-2219.
4. Di Cesare M, Bennett JE, Best N, Stevens GA, Danaei G and et al. The contributions of risk factor trends to cardiometabolic mortality decline in 26 industrialized countries (2013) Int J Epidemiol 42: 838-848. https://doi.org/10.1093/ije/dyt063
5. Staessen JA, Kuznetsova T and Stolarz K. Hypertension prevalence and stroke mortality across populations (2003) JAMA 289: 2420-2422. https://doi.org/10.1001/jama.289.18.2420
6. Mancia G, Fagard R, Narkiewicz K, Redon J, Zanchetti A and et al. 2013 ESH/ESC guidelines for the management of arterial hypertension: the Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC) (2013) European Heart J 34: 2159-2219. https://doi.org/10.1097/01.hjh.0000431740.32696.cc
7. Talaei M, Sadeghi M, Mohammadifard N, Shokouh P, Oveisgharan S, et al. Incident hypertension and its predictors: the Isfahan Cohort Study (2014) J Hypertens 32: 30-38. https://doi.org/10.1097/HJH.0b013e32836591d4
8. Mendis S, Puska P and Norrving B. Global Atlas on cardiovascular disease prevention and control (2011) Geneva: World Health Organization.
9. Law MR, Morris JK and Wald NJ. Use of blood pressure lowering drugs in the prevention of cardiovascular disease: meta-analysis of 147 randomised trials in the context of expectations from prospective epidemiological studies (2009) BMJ 338: 665. https://doi.org/10.1136/bmj.b1665
10. Manunta P, Cusi D, Barlassina C, Righetti M, Lanzani C, et al. Alpha-adducin polymorphisms and renal sodium handling in essential hypertensive patients (1998) Kidney Int 53:1471-1478. https://doi.org/10.1046/j.1523-1755.1998.00931.x
11. Kaur P, Rao SR, Radhakrishnan E, Rajasekar D and Gupte MD. Prevalence, awareness, treatment, control and risk factors for hypertension in a rural population in South India (2012) Int J Public Health 57: 87-94. https://doi.org/10.1007/s00038-011-0303-3
12. Cai L, Liu A, Zhang L, Li S and Wang P. Prevalence, awareness, treatment, and control of hypertension among adults in Beijing, China (2012) Clin Exp Hypertens 34: 45-52. https://doi.org/10.3109/10641963.2011.618206
13. Saeed AA, Al-Hamdan NA, Bahnassy AA, Abdalla AM, Abbas MA, et al. Prevalence, awareness, treatment, and control of hypertension among saudi adult population: a National Survey (2011) Int J Hypertens 2011: 174135. https://doi.org/10.4061/2011/174135

14. Dorobantu M, Darabont RO, Badila E and Ghiorghe S. Prevalence, awareness, treatment, and control of hypertension in romania: results of the SEPHAR study (2010) Int J Hypertens 2010: 970694. http://dx.doi.org/10.4061/2010/970694
15. McDonald A, Motta J, Roa R, Fontes F, Batista I, et al. Prevalencia de Factores de Riesgo Asociados a Enfermedad Cardiovascular (2012) Instituto Conmemorativo Gorgas de Estudios de la Salud, Panama, USA.
16. Disease Control and Prevention. Vital Signs: Awareness and treatment of uncontrolled hypertension among adults - United States, 2003 -2010 (2012) Morbidity and Mortality Weekly Report 61: 703-709.
17. Hussain AA, Elzubier AG and Ahmed ME. Target organ involvement in hypertensive patients in Eastern Sudan (1999) J Human Hypertension 13: 9-12. https://doi.org/10.1038/sj.jhh.1000719
18. Fatma Mostafa Mahrous. Factors affecting compliance of hypertensive patients toward therapeutic regimen (2015) Life Sci J 12: 62.
19. Al-Saadi R, Al-Shukaili S, Al-Mahrazi S and Al- Busaidi Z. Prevalence of uncontrolled hypertension in primary care settings in Al seeb wilayat, oman (2011) Sultan Qaboos Univ Med J 11: 349-356.
20. Rashid Al-Saadi, Sulaiman Al-Shukaili, Suleiman Al-Mahrazi and Zakiya Al-Busaidi. Prevalence of Uncontrolled Hypertension in Primary Care Settings in Al Seeb Wilayat (2011) SQU MED J 11: 349-356.
21. Al-Rukban MO, Al-Sughair AM, Al-Bader BO and Al-Tolaihi BA. Management of hypertensive patients in Primary health care setting: Auditing the Practice (2007) Saudi Med J 28: 85-90.
22. Al Khaja KA, Sequeira RP and Damanhori AH. Treatment of hypertension in Bahrain (2003) Ann pharmacother 37: 1511-1517. https://doi.org/10.1345/aph.1C430
23. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, et al. The seventh Report of the joint National committee on Prevention, Detection, Evaluation, and treatment of high blood pressure: The JNC 7 report (2003) JAMA 289: 2560-2572. https://doi.org/10.1001/jama.289.19.2560
24. Wang TJ and Vasan RS. Epidemiology of uncontrolled hypertension in the United States (2005) Circulation 112: 1651. https://doi.org/10.1161/CIRCULATIONAHA.104.490599
25. Greenland P, Knoll MD, Stamler J, Neaton JD, Dyer AR, et al. Major risk factors as antecedents of fatal and non-fatal coronary heart disease events (2003) JAMA 290: 891. https://doi.org/10.1001/jama.290.7.891
26. Wong ND, Thakral G, Franklin SS, Lltalien GI, lacobs Mj, et al. Preventing heart disease by controlling hypertension: Impact of hypertensive subtype, stage, age, and sex (2003) Am Heart J 145: 888-895. https://doi.org/10.1016/S0002-8703(02)94787-3
27. Fox JC Leight K, Sutradhar SC, Demopoulos LA, Gleim GW, Lewin AJ, et al. The JNC -7 Approch compared to conventional treatment in diabetic patients with hypertension; A double –blind trial of initial monotherapy vs combination therapy (2004) J Clin Hypertens (Greenwich) 6: 437-442.
28. Neutel JM, Smith DH, Weber MA, Schofield L, Purkatastha D, et al. Efficacy of combination therapy for systolic blood pressure in patients with severe systolic hypertension: The systolic Evaluation of Lotrel Efficacy and Comparative Therapies (SELECT) study (2005) J Clin Hypertens 7: 641-646. https://doi.org/10.1111/j.1524-6175.2005.04615.x
29. Almahrezi A, Al-Zakwani I, Al-Aamri A, Al-Khaldi S, Al-Zadjali N, et al. Control and management of hypertension at a university health center in Oman (2006) SQU Med J 8: 179-184.
30. Deqli Esposti E, Di Martino M, Sturani A, Russo P, Dradi C, et al. Risk factors for uncontrolled hypertension in Itally (2004) J Hum Hypertens 18: 207-213. https://doi.org/10.1038/sj.jhh.1001656
31. Knight EL, Bohn RI, Wang PS, Glynn RJ, Mogun H, et al, Predictors of uncontrolled hypertension in ambulatory patients (2001) Hypertension 38: 809-814. https://doi.org/10.1161/hy0901.091681