Hypertension control and co-morbidities in primary health care centers in Riyadh

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BACKGROUND: The prevalence of hypertension in Saudi Arabia has been assessed only in preliminary reports. The aim of this study was to determine the degree of control of blood pressure and the prevalence of common hypertension co-morbidities among hypertensive patients attending primary healthcare (PHC) centers in Riyadh.

METHODS: A cross-sectional study was conducted by reviewing medical records of hypertensive patients during May and June 2001. Two hundred fifty-five medical records were selected by a stratified randomization process according to the distribution of the 73 PHC centers in the city and the total number of hypertensive patients registered in the mini-clinic of each PHC center. Trained mini-clinic nurses collected data using a data collection form developed for this purpose.

RESULTS: Of 255 patients, 121 (47.5%) were males and 134 (52.5%) were females; the mean age was 57.2±11.1 years and 8.3% were smokers. The majority, 204 (85.7%), had greater than normal body weight. Only 101 (40.4%) had controlled systolic BP and 129 (51.6%) had controlled diastolic BP. The most common co-morbidity was diabetes mellitus, found in 98 (38.4%), followed by dyslipidemia in 50 (19.6%), bronchial asthma in 28 (11.0%) and renal diseases in 12 (4.7%). Except for osteoporosis, which was reported by females only (P=0.003), the occurrence of hypertensive co-morbidities did not vary from other demographic characteristics.

CONCLUSION: This study demonstrated poor blood pressure control in the mini-clinics in PHC centers. To improve the quality of care for hypertensive patients, we recommend an improvement in PHC physician knowledge of and attitudes toward the importance of achieving targeted blood pressure levels.

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Hypertension is a chronic condition and a major public health problem.[1] It can adversely affect the health status of the individual, family and community and directly affects the quality of health and possibly of life in the general population. The prevalence of hypertension is a factor in determining the need for new health services.[2]

Raised blood pressure is mostly asymptomatic, but without being noticed produces a variety of structural changes in arteries that supply blood to the brain, heart, kidneys and elsewhere.[3] It is an expensive disease to treat, but a major modifiable risk factor for coronary heart disease (CHD), cerebrovascular accidents (CVA), congestive heart failure (CHF) and renal failure.[4-7] The risk of cardiovascular disease depends on blood pressure, coexistent risk factors, and whether there is hypertensive damage to target organs.[8]

The prevalence of hypertension is increasing in many parts of the

world. In Europe, it is 34.2% compared with 27.6% in North America.[9-11] In Kuwait, the most recent data on hypertension showed a prevalence rate of 26.3%.[12] In Qatar, a recent study showed that the prevalence of hypertension was 32.1%.[13] In Egypt, a recent study showed that the prevalence of high normal blood pressure was 20.1% and hypertensive was 45.3%.[14] In Oman, the prevalence rate of high systolic or diastolic blood pressure is 33%.[15]

The prevalence of hypertension in the Kingdom of Saudi Arabia has not been appropriately determined, but in some preliminary reports from the East, Central and West regions prevalence ranges between 5% to 30%.[16-19] In a population-based survey to determine the prevalence of hypertension in the adult population in the different geographical regions of the Kingdom, the results showed that in the Riyadh region, the prevalence of systolic blood pressure (SBP) was 18% (19.2% in males and 17.3% in females); and diastolic blood pressure (DBP) was 22.1% (21.4% in males and 22.6% in females).[20]

At the primary health care (PHC) level, hypertension is frequently one of the most common reasons for patients to see primary care physicians.[21] The overall rate of hypertension in PHC centers in Riyadh city was 15.4%. Of these, 11.3% were known hypertensive and 4.1% were newly diagnosed. About 27% of all hypertensive were not aware of their disease and more than 31% of known hypertensives were apparently not well controlled.[22]

Although studies on the degree of control of hypertension in our community are few, the rate of BP control seems to be less than expected. This study was carried out to determine the prevalence of controlled blood pressure and common co-morbidities among hypertensive patients attending PHC centers in Riyadh. The PHC system in Saudi Arabia, which provides basic essential health care for individuals and families, was introduced in 1984.[23] In Riyadh city, there are 73 PHC centers distributed into the five sectors of the city. The mini-clinic program was started in some centers to serve patients with chronic diseases, including diabetes mellitus, hypertension and bronchial asthma, with a regular monthly follow-up.

Methods

We conducted a cross sectional study by reviewing patient medical records during the months of May and June 2001. After permission from health authorities in Riyadh, one PHC center was selected randomly from each sector. Around 1800 hypertensive patients registered in the mini-clinics of those centers. Two hundred fifty-five medical records were selected by a stratified randomization process according to the total number of hypertensive patients registered in the mini-clinic of each PHC center. A sample size of 249 files was calculated on the assumption of a 25% prevalence of controlled BP and a degree of precision of 0.05 at the 95% level of confidence.

Subjects were eligible for our study if they were adults, hypertensive, having regular follow-up visits at the mini-clinic and were seen at least once during the last 3 months prior to the study period. Subjects were excluded if they were 18 years of age or less, had missed 3 consecutive appointments, or were being followed in other health institutions (other clinics or hospitals).

A data collection form was developed taking into consideration the opinions of an epidemiologist and biostatistician. The first part covered demographic data: age, sex, nationality, occupation and educational level. The second part concerned data on hypertension: date of diagnosis, date of first and last visit to the PHC center and last BP reading that categorized according to the international standards.[24] The third part covered smoking and obesity (body mass index), both risk factors for hypertension.[25] The fourth part covered co-morbidities of hypertension, including diabetes mellitus, bronchial asthma, cerebrovascular accidents, peripheral vascular diseases, angina, myocardial infarction, congestive heart failure, atrial fibrillation, conduction defects, liver diseases, renal diseases, dyslipidemia, gout, osteoporosis and depression. The results of a pilot study with 12 medical records were used to modify the data collection form. The final data collection form was distributed to data collectors in the selected centers. Trained mini-clinic nurses collected data. The researchers met with them and explained the aims and the methods of the study followed by a practical session on a sample of files.

EPI-info software was used for data entry, management and analysis. Odds ratios with 95% confidence intervals and a chi-square or Fisher exact test were used for studying the associations between different variables at the 95% level of significance.

Results

This cross-sectional study included 255 medical records. The mean age of the participants was 57.2±11.1 years. Females constituted 52.5% of the sample. Most of the participants were Saudis (81%), many were housewives (45%), and about half were illiterate (52%) (Table 1). Twenty-one (8.3%) were smok-

ers. The majority, 204 (85.7%), were above a normal weight. Morbid obesity (BMI ≥ 40) was seen in 22 (9.2%), while only 34 (14.3%) were in the normal BMI range (Table 2). The majority, 220 (87.3%), of hypertensive patients were diagnosed within 5 years and 169 (66.8%) began to be followed in the PHC centers less than 3 years prior to the study (Table 3).

Unfortunately, only 101 (40.4%) had a controlled systolic BP (<140 mm Hg) and 129 (51.6%) had a controlled diastolic BP (<90 mm Hg) (Table 4). There was no significant statistical difference in the control of SBP or DBP between different primary health centers (PHC) (P>0.05). Diastolic blood pressure control was not affected by any demographic or co-morbidity factors (P>0.05) while systolic blood pressure control was only enhanced by the presence of dyslipidemia (P=0.023).

The highest prevalence of hypertensive complications and co-morbidities in PHC centers was for diabetes 98 (38.4%), followed by dyslipidemia in 50 (19.6%), bronchial asthma in 28 (11.0%) and renal diseases in 12 (4.7%). No cases of atrial fibrillation or peripheral vascular disease were reported. All other complications and co-morbidities were not more than 4% for each one. Except for osteoporosis, which was reported only by females (P=0.003), the occurrence of hypertensive co-morbidities did not vary between different demographic factors.

Table 1. Demographic characteristics of hypertensive patients in primary healthcare centers in Riyadh, 2001.

Characteristic		N	%
Age (n = 254) (years)	<65	185	72.8
	>65	69	27.2
Sex (n = 255)	Male	121	47.5
	Female	134	52.5
Nationality (n=255)	Saudi	206	80.8
	Non-Saudi	49	19.2
Occupational Status (n = 254)	Professional	37	14.6
	Technical	13	5.1
	Manual	5	2.0
	Retired	47	18.5
	Housewife	114	44.9
	Others	38	18.4
Educational level (n = 245)	Illiterate	128	52.2
	Primary	45	18.4
	Intermediate	25	10.2
	Secondary	27	11.0
	University	20	8.2

Table 2. Body weight and smoking among hypertensive patients followed in primary healthcare centers in Riyadh, 2001.

Risk Factor		N	%
BMI (n = 238)	Normal weight (<25 kg/m2)	34	14.3
	Overweight (25-29.9 kg/m2)	84	35.3
	Obese (Class I & II) (30-39.9 kg/m2)	98	41.2
	Morbidly obese (≥40 kg/m2)	22	9.2
Smoking (n = 252)	Yes	21	8.3
	No	231	91.7

Discussion

Unfortunately, 60% of hypertensive patients followed in PHC centers have uncontrolled SBP and 50% have uncontrolled DBP. A similar pattern was shown in another study in Saudi Arabia, where uncontrolled BP was 63% in males and 76% in females.[17] A lower figure (28.8%) was reported by Al-Shammari et. al.[26] These findings are also within the range of data reported in some international studies[11,24,27,28] and much worse than the 20% reported by another international study.[29] However, the Canada Heart Health Survey found that only 13% of Canadians with hypertension were adequately controlled.[30] This result was even lower than the 25% found in the US National Health and Nutrition Examination Survey (NHANES III).[31]

The burden of elevated blood pressure as a risk factor for cardiovascular diseases, heart failure, cerebrovascular disease and renal failure in both men and women has been clarified in a large number of epidemiological studies,[24,32,33] and there is evidence that patients with target organ damage associated with hypertension have a higher morbidity and mortality.[12] A 20 mm Hg increase in DBP was associated with a 60% increased risk of death over a 2-year period.[18] The inadequate control of hypertension not only has significant consequences in terms of patient morbidity and mortality but also in terms of health care costs.[18]

Studies on control of high blood pressure identified four barriers for successful control—lack of de-

tection, lack of referral to care, lack of appropriate treatment and lack of long-term maintenance.[18,34] Poor compliance with hypertensive therapy is thought to be a major factor in the failure to control hypertension.[35] Locally, in one study from Tabuk, the compliance rate was as low as 53% and was accompanied by inadequate blood pressure control among non-compliant subjects.[36] Another important reason for poor blood pressure control is a lack of updated information on how to manage hypertensive patients properly among physicians. Further improvements in hypertension control will require changes in physician behavior, which should be associated with awareness of practice guidelines and familiarity with evidence-based medicine methods.[37] Multiple high quality long-term cohort studies and randomized clinical trails have shown that the risks from raised blood pressure can be partially reversed if an optimal blood pressure is achieved.[8,11,24] However, a key factor associated with successful blood pressure control is the physician's knowledge of and attitude towards the importance of achieving targeted blood pressure levels.[21]

Modification of lifestyle is also recommended in the management of individuals with hypertension so that normal blood pressure can be maintained, thereby reducing morbidity from stroke, myocardial infarction (MI), congestive heart failure and renal failure.[24,35,38] Unfortunately, more than two thirds of the selected sample were overweight. The present study revealed a high association between hypertension and obesity. The same finding was reported worldwide.[13,18,39-42] In general, weight gain in adults is a potent risk factor for the later development of many complications. The obese hypertensive patient is at a high risk for congestive heart failure and sudden death.[43,44] Furthermore, several studies have shown that weight reduction in the obese hypertensive patient often reduces arterial blood pressure and produces cardiovascular changes.[24,41,45-47]

The prevalence of smoking among hypertensive patients observed in this study is less than what was reported in the eastern region of Saudi Arabia[48] and in Qatar.[13]

The highest co-morbid conditions were diabetes mellitus followed by dyslipidemia and bronchial asthma. Around 40% of hypertensive patients in this study were diabetics, a prevalence equal to that in another local study[27] and a similar study from Sudan,[49] but less than that observed in Qatar[13] (68.9%) and more than that reported by another national study

Table 3. History of hypertension among hypertensive patients followed in primary healthcare centers in Riyadh, 2001.

Past Medical History		N	%
Date of diagnosis (years) (n = 252)	<1	33	13.1
	1-5	187	74.2
	>5-10	13	6.2
	>10-15	17	6.8
	>15	2	0.8
Date of first visit to PHC center (years) (n = 253)	<1	29	11.5
	1-2	36	14.2
	>2-3	104	41.1
	>3-4	34	13.4
	>4-5	18	7.1
	>5	32	12.6

Table 4. Blood pressure control among hypertensive patients followed in PHC centers in Riyadh, 2001.

Blood Pressure Level		N	%
Systolic (mm Hg) (n = 250)	140-159	91	36.4
	≥160	58	23.2
	Uncontrolled (≥140)	149	59.6
Diastolic (mm Hg) (n = 250)	90-99	76	30.4
	≥100	45	18.0
	Uncontrolled (≥90)	121	48.4

(22.2%).[48] It was found that aggressive reduction of blood pressure of diabetic patients will lead to reduced rates and progression of renal and cardiovascular diseases.[50,51] The target blood pressure for hypertensive diabetic patients is <130/80, especially if the patient has microalbuminuria or macroalbuminuria.[24,42,51]

The level of blood pressure and presence of other risk factors and co-morbidities have long been recognized as a determinant of the risks for several common cardiovascular diseases, including coronary heart disease, cerebrovascular disease, heart failure and renal failure.[3,52] For instance, the presence of smoking, high cholesterol, diabetes and hypertension combined increase the risk of vascular events by 20 times.[53,54]

The objective of hypertension care is to reduce its mortality and complications and to improve the quality of life for patients suffering from this

chronic health problem. To achieve these aims, it is mandatory to have adequate diagnostic, therapeutic and educational resources in addition to competent physicians who can manage hypertension by using a continuing, comprehensive and coordinated approach.[55]

Management of hypertension in PHC centers is highly affected by lack of resources and facilities. Many essential resources for the care of patients with hypertension are not available at PHC settings.[56] Urgent provision of these resources is essential to introduce good health care for hypertensive patients.

To improve the quality of care for hypertensive patients and to ensure better control, we recommend improvements in PHC physician knowledge about chronic disease management, updating the national guidelines for management of hypertension and keeping them accessible to doctors in PHC clinics, improving the quality of the filing system, improvement of screening programs and the provision of essential resources for hypertension care. Further research to determine the underling reasons for inappropriate blood pressure control and the cost of blood pressure control are also recommended.

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