Prevalence and Control of Hypertension in Iraqi Diabetic Patients: A Prospective Cohort Study

Abbas Ali Mansour*

Department of Medicine, Basrah College of Medicine, Basrah, Iraq

Abstract: Objectives: Diabetes and hypertension are major risk factors for cardiovascular disease, a leading cause of death in humans. The aim of our study was to determine the prevalence of hypertension, and hypertension control among adults with diabetes in Basrah (Southern Iraq).

Methods: A prospective cohort study was conducted at Al-Faiha Diabetes and Endocrine Center in Basrah. It was started in August 2008 to April 2011. The total number of recruited patients with diabetes was 5578.

Results: Hypertensive diabetic patients constituted 89.6% of this study cohort, with 45.3% of them newly discovered in the center. From hypertensive patients, 48.2% achieved the target blood pressure of less than 130/80 mmHg. The results of the multivariate analyses showed that the factors independently associated with the hypertension were aged > 50 years (odds ratio, 0.4; 95% CI, 0.3 to 0.5; p < 0.001), body mass index equal or more than 25 (odds ratio, 0.5; 95% CI, 0.4 to 0.6; p < 0.001), insulin use (odds ratio, 0.6; 95% CI, 0.5 to 0.8; p < 0.001) and duration of diabetes > 5 years (odds ratio, 0.6; 95% CI, 0.5 to 0.7; p < 0.001).

Conclusion: This study confirmed that hypertension was seen in ~90% of diabetic patients in Iraq, and approximately half of them were achieving target blood pressure level.

Keywords: Diabetes mellitus, hypertension, control, prevalence, Iraq.

INTRODUCTION

Diabetes and hypertension are major risk factors for cardiovascular disease, a leading cause of death in humans [1]. Insulin resistance and hyperglycemia combine to make hypertension more prevalent in the type 2 diabetic patient [2]. Approximately 15% of hypertensive patients are diabetic and approximately 75% of Type 2 diabetic patients are hypertensive [3].

The American Diabetes Association (ADA) in 2002, defined hypertension in diabetic patients as blood pressure (BP) ≥ 140/90 mmHg and a target BP goal of < 130/80 mmHg is reasonable [4]. For the first time the ADA and the Canadian Diabetes Association in 2008 stated that repeat systolic BP ≥ 130 mmHg or diastolic BP ≥80 mmHg confirms a diagnosis of hypertension in patients with diabetes mellitus [5,6].

The goal for BP in the type 2 diabetic patients is < 130/80 mmHg, and when significant proteinuria is present at 120/75 mmHg or below [7-9]. Control of hypertension in the diabetic patient to the recommended level of below 130/80 mmHg has been shown to decrease both the microvascular and macrovascular complications of diabetes [2].

The aim of the study was to determine prevalence of hypertension, and hypertension control among adults (18 years of age and above) with diabetes in Basrah (Southern Iraq).

METHODS

Setting

A prospective cohort study was conducted at Al-Faiha Diabetes and Endocrine Center in Basrah. This center is the only center for this specialty in Southern Iraq. Its tertiary referral center received diabetic patients with failure of oral antihyperglycemic drugs from primary health care centers and hospitals in Basrah. This center started in August 2008 to concentrate on hypertension control besides glycemic and lipid control in patients with diabetes mellitus. Patients age < 18 years, those with less than 6 months of follow-up, defaulter patients for more than 6 months or pregnant women, were excluded. The total recruited patients with diabetes were 5578, until end of April 2011. The patients were visiting the center every 2 months, and during each visit anthropometric studies were done with measurement of BP and blood glucose and HbA1c according to the indication.

Definitions of the Variables

Duration of diabetes was calculated as the patient’s age at the time of the registration in the center minus age at onset of diabetes. Body Mass Index (BMI) was calculated as weight in kg divided by the square of height in m.
Current smokers were defined as those who reported smoking >100 cigarettes during their lifetime and were currently smoking every day or some days. Ex-smokers were defined as ever smokers who no longer smoked.

BP was measured by a nurse trained in the method using a mercury sphygmomanometer and appropriately sized arm cuffs after patients rested for 5 min seated.

Hypertension in diabetic patients was confirmed if systolic BP was equal or more than 130 mmHg and or diastolic BP equal or more than 80 mmHg on 2 occasions separated by at least 1 day or more, or on medications for hypertension [10].

For new hypertensive patients with a systolic BP of 130 -139 mmHg or a diastolic BP of 80 - 89 mmHg, treatment was given as lifestyle/behavioral therapy alone for a maximum of 3 months and then, if targets are not achieved, they were treated pharmacologically with agents that block the renin-angiotensin system. Patients with hypertension (systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg) were given drug therapy in addition to lifestyle/behavioral therapy [10]. Drug therapy was titrated according to algorithms used by most centers [2]. In brief patients started candesartan 8 mg once daily gradually increased dose until 16 mg once daily or enalapril 10 mg twice daily, gradually increased dose to 20 mg twice daily over 2-6 months. If this failed to achieve the target, hydrochlorothiazide 12.5 mg once daily was added, gradually increasing the dose to 25 mg daily. Patients still having a BP control out of target were given amlodipine 5 mg daily as third drug. Patients on beta-blockers for associated ischemic heart disease or furosemide for heart failure were continued. Patients already hypertensive and on medication other than above therapies were changed to the above drugs gradually. Single agents were enough to control BP in 15% of patients, 2 drugs needed in 55% and 3 drugs ultimately needed in 30%. Drugs were supplied free of charge.

Data analysis was done after April 2011. Any patients with systolic BP < 130 mmHg and or diastolic BP < 80 mmHg at the last visit were considered to have controlled BP.

STATISTICAL ANALYSES

Statistical Package SPSS for Windows, version 18.0 (SPSS Inc), was used for statistical analysis. The mean ± SD was determined for quantitative data, and frequency for categorical variables. The Chi-square test was used to analyze group differences for categorical variables, t-test for continuous variables and a p value of <0.05 was considered significant. Multivariate analyses using logistic regression was used to study factors independently associated with hypertension.

RESULTS

More women (Table 1) were included in this study (55.6 vs 44.4%). The mean age was 51.4 ± 13.7 years, with 56.3% of them aged more than 50 years. About 70.6% of our patients were either overweight or obese. Current smokers constituted 12.8%. Most of the patients were on insulin (71.8%), because of the duty of the center that is explained in the methods. The mean duration of diabetes was 8.7 ± 6.9 years and 62.2% had diabetes for >5 years. Hypertensive patients constituted 89.6% of this study cohort, of which 45.3% were newly discovered in the center. From hypertensive patients, 48.2% achieved the target of BP < 130/80 mmHg. There was no statistically significant difference between the 2 hypertension groups (controlled vs non-controlled) as regards prevalence of cardiovascular diseases, proteinuria (overt) or mean HbA1c.

Table 2, shows variables associated with hypertension. Hypertension was higher among women than men (91.0 vs 88.0%, p < 0.001). The mean age and BMI were higher in the hypertensive group (52.3 ± 13.1 vs 43.5 ± 15.9 and 28.2 ± 5.9 vs 25.2 ± 5.7, respectively, p < 0.001). Insulin was used more in the hypertensive group (72.2% vs 68.1%, p = 0.03). The duration of diabetes was more in the hypertensive group (8.9 ± 6.9 vs 7.0 ± 6.3, p < 0.001).

Table 1. Baseline Characteristics

| Variables                      | n (%)          |
|--------------------------------|----------------|
| Gender                         |                |
| Men                            | 2477(44.4)     |
| Women                          | 3101(55.6)     |
| Age (Years)                    |                |
| Mean ± SD                      |                |
| ≤50                            | 2434(43.7)     |
| >50                            | 3144(56.3)     |
| BMI (kg/m²)                    |                |
| Mean ± SD                      |                |
| Normal weight <25              | 1632(29.2)     |
| Overweight 25-29.9             | 1906(34.1)     |
| Obesity ≥ 30.0                 | 2040(36.5)     |
| Smoking                        |                |
| Current                        | 715(12.8)      |
| Ex-smoker                      | 409(7.3)       |
| Never                          | 4454(79.8)     |
| Type of diabetes               |                |
| Type 1                         | 536(9.6)       |
| Type 2                         | 5042(90.4)     |
| Insulin use                    |                |
|                                 | 4007(71.8)     |
| Duration of diabetes (years)   |                |
| Mean ± SD                      |                |
| ≤5                             | 2104(37.7)     |
| >5                             | 3474(62.2)     |
| Hypertension                   | 5003(89.6)     |
| New hypertension               | 2529 (45.3)    |
| Controlled hypertension        | 2414 (48.2)*   |

* of hypertensive patients.
had controlled BP with the ADA target < 130/80 mmHg.

The authors thank Lesley Pocock for reviewing the manuscript and the staff and patients of Al-Faiha Diabetes and Endocrine Center in Basrah for their contribution to this work.

ACKNOWLEDGEMENTS

The authors thank Lesley Pocock for reviewing the manuscript and the staff and patients of Al-Faiha Diabetes and Endocrine Center in Basrah for their contribution to this work.

REFERENCES

1. Grossman E, Messerli FH. Diabetic and hypertensive heart disease. Ann Intern Med 1996; 115: 125-130.
2. Bell DS. Treatment of diabetic hypertension. Diabetes Obes Metab 2009; 11: 433-44.
3. Ostergren J, Poultet NR, Sever PS, et al. ASCOT investigators. The anglo-scandinavian cardiovascular outcomes trial: blood pressure-
Prevalence and Control of Hypertension in Iraqi Diabetic Patients

Abbas Ali Mansour

Received: February 29, 2012
Revised: March 21, 2012
Accepted: April 11, 2012

© Abbas Ali Mansour; Licensee Bentham Open.

This is an open access article licensed under the terms of the Creative Commons Attribution Non-Commercial License (http://creativecommons.org/licenses/by-nc/3.0/) which permits unrestricted, non-commercial use, distribution and reproduction in any medium, provided the work is properly cited.

lowering limb: effects in patients with Type II diabetes. J Hypertens 2008; 26: 2103-11.

1. American Diabetes Association. Position statement on treatment of hypertension in adults with diabetes. Diabetes Care 2002; 25: 213-29.

2. Canadian Diabetes Association. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008; 32: S1-S201.

3. Chobanian AV, Bakris GL, Black HR, et al. Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National Heart, Lung, and Blood Institute; National High Blood Pressure Education Program Coordinating Committee. Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Hypertension 2003; 42: 1206-52.

4. Mancia G, De Backer G, Dominiczak A, et al. Management of Arterial Hypertension of the European Society of Hypertension; European Society of Cardiology: 2007 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). J Hypertens 2007; 25: 1751-62.

5. AACE Diabetes Mellitus Clinical Practice Guidelines Task Force. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the management of diabetes mellitus. Endocr Pract 2008; 14: 802-3.

6. American Diabetes Association. Standards of Medical Care in Diabetes. Diabetes Care 2011; 34: 113-61s.

7. Abdel-Aal NM, Ahmad AT, Froelicher ES, Batieha AM, Hamza MM, Ajouni KM. Prevalence of dyslipidemia in patients with type 2 diabetes in Jordan. Saudi Med J 2008; 29: 1423-8.

8. Fayzeh M, Mubarak A, Erika S. Froelicher, et al. Hypertension among 1000 patients with type 2 diabetes attending a national diabetes center in Jordan. Ann Saudi Med 2008; 28: 346-51.

9. Alwakeel JS, Sulimani R, Al-Asaad H, et al. Diabetes complications in 1952 type 2 diabetes mellitus patients managed in a single Institution. Ann Saudi Med 2008; 28: 260-6.

10. Wong ND, Lopez VA, L’Italien G, Chen R, Kline SEJ, Franklin S. Inadequate control of hypertension in US adults with cardiovascular disease comorbidities in 2003-2004. Arch Intern Med 2007; 167: 2431-6.

11. Suh D-C, Kim C-M, Choi I-S, Plauschiniat CA, Barone JA. Trends in blood pressure control and treatment among type 2 diabetes with comorbid hypertension in the United States: 1988-2004. J Hypertens 2009; 27: 1908-16.

12. Resnick HE, Foster GL, Bardsley J, Ratner RE. Achievement of American Diabetes Association clinical practice recommendations among U.S. adults with diabetes, 1999-2002: the National Health and Nutrition Examination Survey. Diabetes Care 2006; 29: 531-7.

13. Vijayaraghavan M, He G, Stoddard P, Schillinger D. Blood pressure control, hypertension, awareness, and treatment in adults with diabetes in the United States-Mexico border region. Rev Panam Salud Publica 2010; 28: 164-73.

14. Escobar C, Barrios V, Calderón A, et al. Diabetes mellitus in hypertensive population attended in primary care in Spain. Blood pressure and lipid control rates. Rev Clin Esp 2007; 207: 221-7.

15. Mansour AA, Wanoose HL, Odaa AH. A three year cohort prospective type 2 diabetes control study in Basrah. J Diabetes Metab 2011; 2: 2.

16. Tseng CH. Exogenous insulin use and hypertension in adult patients with type 2 diabetes mellitus. Arch Intern Med 2006; 166: 1184-9.

17. Kern W, Peters A, Born J, Fehm HL, Schultes B. Changes in blood pressure and plasma catecholamine levels during prolonged hyperinsulinemia. Metabolism 2005; 54: 391-6.

18. Bangalore S, Kumar S, Lobach I, Messerli FH. Blood pressure targets in subjects with type 2 diabetes mellitus/impaired fasting glucose: observations from traditional and bayesian random-effects meta-analyses of randomized trials. Circulation 2011; 123: 2799-810.