Blood pressure control in an African American sample with diabetes mellitus in an urban eye clinic

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Background: The adequate control of blood pressure in patients with diabetes mellitus (DM) is important to limit the ocular and systemic complications of the disease. Hypertension in African Americans is among the highest in the world. This cross-sectional study reports the level of blood pressure control in a small sample of African American patients with DM at an urban eye care facility using the criteria defined by the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC VII).

Methods: Five attending faculty members of the Illinois College of Optometry identified 234 African American patients with a diagnosis of DM over a period of 16 months. Blood pressure readings were recorded once at the time of their visit and were classified as controlled or uncontrolled based on the JNC VII cutoff of blood pressure less than 130/80 mmHg.

Results: Among the 234 African American patients in this study, 174 (74.4%) reported having DM and hypertension, and 60 (25.6%) reported having DM without hypertension. Of the patients with DM and a self-reported diagnosis of hypertension, 13.2% were controlled. Of the patients with diabetes without a self-reported diagnosis of hypertension, 26.7% were found to be adequately controlled. For the pooled data of 234 patients with diabetes, 16.7% met the JNC VII guidelines.

Conclusion: The inadequate control of blood pressure in the African American population with DM is associated with increased disability and death from cardiovascular and renal disease. The results of this small cross-sectional study are consistent with those of other studies that show poor control of blood pressure in African American patients who have DM. Preventable blindness secondary to accelerated diabetic retinopathy from uncontrolled hypertension is a concern to all eye care practitioners.

Key Words: African American, blood pressure, diabetes mellitus, hypertension

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Hypertension is approximately twice as common in persons with diabetes mellitus (DM) as those without and occurs more frequently in persons with type 1 DM than type 2 DM.[1] The prevalence of co-existing hypertension and DM is almost twice as great among African Americans compared with whites.[2] Optimal control of blood pressure is essential in the prevention of hypertension-related death and disability from heart failure, stroke, myocardial infarction, and end-stage renal disease. Also, co-existing hypertension in patients with DM may have an interactive effect on vascular structures to become increasingly vulnerable to the effects of high blood pressure.[3] Adequate blood pressure control has been defined by the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC VII) in 2003, which included a change in recommendations from its previous report. It recommended a target blood pressure goal of less than 130/80 mmHg in people with DM, a further decrease from the JNCVI guidelines of less than 130/85 mmHg.[4] Support for these newer guidelines were reported in the Hypertension Optimal Treatment Trial[5] that found the frequency of cardiovascular disease in people with DM was reduced with the aggressive treatment of blood pressure. Similar conclusions were drawn from the Systolic Hypertension in the Elderly Program[6] and the Systolic Hypertension in Europe Study,[7] which targeted elderly patients and provided more evidence regarding the benefits of reducing blood pressure in patients with DM. Elevated blood pressure in African Americans, with a prevalence of 37% among both men and women, is among the highest in the world.[8] The goal of our study was to identify the level of blood pressure control in our African American population with DM at a metropolitan eye care facility.

Methods

The data for this study were taken from a database generated by 5 attending faculty members of the Illinois Eye Institute, the teaching facility of the Illinois College of Optometry in Chicago, Illinois. The database consisted of all unique patient encounters by the faculty over a 16-month period at the clinical facility where a signed consent for release of records for educational and research purposes was obtained. The information used from the database included age, gender, race, history of DM (type 1 and type 2) and/or hypertension and blood pressure as measured at the time of their initial visit. The existing protocol for blood pressure measurements at the Illinois Eye Institute included all patients older than 35 or those with a current or previous diagnosis of hypertension or DM. Blood pressure was measured once, right arm sitting, and was not repeated. The presence of DM and hypertension was self-reported and was determined by reviewing the medical history interview form that is filled out by the patient or the patient case history section of the clinic record. The racial status was determined by reviewing the demographic information in the patient's chart. There were 234 African American patients with a diagnosis of DM of the 1831 patients with recorded blood pressure and appropriate consent in the database of this cross-sectional study.

Results

The demographic characteristics of our older African American, predominately female sample are listed in Table 1. There was a high prevalence of patients with a presenting self-reported diagnosis of hypertension (74.4%) in the 234-patient sample with DM at the Illinois Eye Institute. These patients tended to be older with a mean age of 62.1 years compared with a mean age of 57.4 years in the nonhypertensive group. Among the 174 patients with DM and a diagnosis of hypertension, only 13.2% had their blood pressure well controlled based on the recommendations of JNC VII criteria of blood pressure less than 130/80 mmHg. Among the 60 patients with DM who did not report having high blood pressure, only 26.7% had their blood pressure controlled based on the JNC VII criteria (Table 2). Among the pooled data of all 234 patients with diabetes, only 16.7% had controlled blood pressure. Because of the cross-sectional nature of the study, the data presented reflect only 1 blood pressure reading at different times of day and may not reflect the true hypertensive status of the patient.

Table 1. Demographic characteristics of the study population of 234 African American patients with diabetes mellitus

Characteristic	N (%)	Yr (mean ± SD)
Age		60.9 ± 13.2
Gender		
Male	87 (37.2)	60.7 ± 13.4
Female	147 (62.8)	61.1 ± 13.0
Patients with diabetes and hypertension diagnosis	174 (74.4)	62.1 ± 12.3
Patients with diabetes without hypertension diagnosis	60 (25.6)	57.4 ± 15.2

Discussion

The relationship between glycemic control and diabetic retinopathy has been clearly demonstrated by 2 landmark studies. The Diabetic Control and Complications Trial (DCCT)[9] studied type 1 diabetics and found the 3-year risk for the development of diabetic retinopathy was reduced by 75% in the intensive insulin treatment group compared with the standard treatment group. The United Kingdom Prospective Diabetic Study (UKPDS)[10,11] reported the results of intensive insulin therapy in patients with type 2 DM and found that it was effective in reducing systemic microvascular complications by 25% with fewer laser-treated cases of diabetic retinopathy contributing significantly to the decrease in the study endpoint. The relationship between blood pressure and diabetic retinopathy is less clear because many studies have come to differing conclusions. Aiello et al.[12] have summarized the studies on the association between hypertension and the development of diabetic retinopathy. Overall, about two thirds of these studies show an adverse effect of elevated diastolic or systolic blood pressure on patients with diabetic retinopathy, but the association is weak among patients in their sixth decade or older with type 2 DM.