The Impact of Lifestyle Behavior on Hypertension Awareness, Treatment, and Control in a Southeastern Population

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ABSTRACT: *Background:* We were interested in determining the rates of hypertension awareness, treatment, and control in individuals living in the southeastern United States and evaluating the impact of lifestyle behaviors on these rates. *Methods:* This is a cross-sectional survey of a sample of community dwellers in the greater Columbia, South Carolina area. The survey was developed from validated community-based survey questionnaires to evaluate demographic and social history (age, gender, race-ethnicity, income, and education), hypertension history (diagnosis and treatment), and lifestyle behavior (servings of fruits and vegetables [FV] and physical activity [PA] duration and frequency), as well as blood pressure measurement. *Results:* A total of 763 people (mean ± standard error age 52.4 ± 0.7 years; 68% women, 53% African American) agreed to be screened. Of all participants with hypertension (438 [58%]), 82% were aware of their illness and 79% were on treatment. Of all hypertensive participants, 39% had their hypertension controlled below 140/90 mm Hg at the time of the survey. Only 11% reported consuming five or more FV per day and 18% reported PA five or more times per week. African-Americans consumed less FV ($P < 0.001$) and performed less PA ($P < 0.001$). Those consuming more FV and exercising more frequently had lower hypertension prevalence and tended to have better control rates. *Conclusions:* In a sample of southeastern residents, the control rate was suboptimal despite a relatively high rate of treatment. Low levels of FV consumption and PA were noted especially in African-American patients and may explain this rate. **KEY INDEXING TERMS:** Hypertension; Southeast; Lifestyle; Community. **[Am J Med Sci 2006;332(4):211–215.]**

Hypertension is the leading modifiable risk factor for many costly diseases in the United States, including stroke, coronary artery disease, heart failure, renal disease, and peripheral vascular disease.[1–3] Although one out of every four adults in the United States has hypertension, more than 30% are unaware of their disease and in 69% the condition is uncontrolled.[4] Moreover, even in hypertensive individuals receiving pharmacologic therapy, in nearly half the hypertension is not controlled to the recommended target of less than 140/90 mm Hg.[4] The elderly segment of the population has an even higher burden of hypertension and its multiple complications.[5] Moreover, the elderly population has worse control rates compared to their younger counterparts.[5] These suboptimal rates are contributing to the persistently high cardiovascular disease rates, which is the number one cause of death in the United States.[6,7]

The southeastern region of the United States has been historically thought to have disproportionately higher rates of hypertension and cardiovascular disease.[8–12] However, the rates of awareness, treatment, and control are not well known. This area is commonly termed the "Stroke Belt" due to its high stroke prevalence and mortality.[8,13] In particular, the state of South Carolina is burdened with a high stroke rate of 68.7/100,000, compared to the US rate of 56.4/100,000, and a high hypertensive renal disease death rate of 8.8/100,000, compared to the US rate of 7.0/100,000.[14]

Unhealthy lifestyle habits, including poor diet and sedentary physical activity (PA), contribute to the high hypertension prevalence and poor rate of hypertension control observed nationally.[3,15–18] Lifestyle habits that lower blood pressure such as a diet rich in fruits and vegetables (FV) and increased PA are poor in South Carolina as well. For example,

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according to the Behavioral Risk Factor Surveillance System (BRFSS) results, 23.3% of adults living in South Carolina report that they had no PA in the past 30 days, and 22.3% reported consuming fewer than five servings of FV per day.[19] The impact of FV consumption and PA on hypertension awareness, treatment, or control is not well known in this geographic population. Available data from BRFSS does not include actual blood pressure measurement[19] and hence it is not possible to determine rates of awareness and control in the community. It is also not possible to assess the association between reported diet and PA habits with hypertension awareness or control in this southeastern population.

Therefore, the objective of this survey was to assess the rates of hypertension awareness, treatment, and control in a sample of individuals living in the greater Columbia area in South Carolina. We also wanted to assess the impact of these behaviors on hypertension control. We were particularly interested in investigating these issues in African-American individuals.

Methods

Sample

This is a cross-sectional survey of a sample of community dwellers in the greater Columbia area in South Carolina. Participants surveyed were recruited from events at which free blood pressure measurements were offered by the Center for Senior Hypertension, a specialty clinic in the same community. A total of 78 outreach health events were conducted: 39 community blood pressure screening and health fairs, 29 faith-based blood pressure screening, and 9 barbershop blood pressure screenings. Because of our interest in recruiting African-Americans in our survey, we focused our events on African-American churches, barbers, and Black Expo, which led to an over-representation of African-Americans in our final sample.

During each of these screening events, participants had their blood pressure measured using the American Heart Association guidelines by a trained nurse or medical assistant. In addition, each participant was asked to complete a brief survey about his or her blood pressure and lifestyle history. The survey was optional. After completing the questionnaire and blood pressure measurement, individuals were offered blood pressure education materials and, if needed, counseling on their need for follow-up regarding their blood pressure with their physicians. The Institutional Review Board (IRB) at Palmetto Health has approved this survey.

Questionnaire

The screening questionnaire was developed from standardized survey questions that have been validated in different populations. In particular, we selected questions from BRFSS for the exercise and fruit and vegetable consumption[19] and the National Health And Nutrition Examination Survey for hypertension awareness and treatment.[20] The questionnaire also included a section on age, gender, race-ethnicity, income, and education.

Participants were considered hypertensive if their systolic blood pressure (SBP) was 140 mm Hg or greater, their diastolic blood pressure (DBP) was 90 mm Hg or greater, or they reported receiving antihypertensive medications at the time the survey was conducted. Participants were considered aware of their hypertension if they answered yes to the question: "Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?" and treated if they answered yes to the question: "If so, are you currently taking medicine for your high blood pressure?" A participant was considered controlled if they were hypertensive as defined above and their SBP was less than 140 mm Hg and DBP was less than 90 mm Hg.

The χ^2 and t tests were used to compare hypertensive versus nonhypertensive, aware versus not aware, and controlled versus uncontrolled hypertension participants. SPSS (Chicago, IL) statistical package was used to complete the analysis.

Results

Sample Characteristics

During our screening events, 763 people agreed to participate in our survey. Mean ± standard error (SE) age for all participants was 52.4 ± 0.7 years; 68% were women, 53% were African-American, 34% reported an income less than $25,000 and 28% $50,000 or greater, and 28% had high school education or less. Of those, 260 participants refused to provide income information and 51 participants did not agree to blood pressure measurements.

Lifestyle Behavior

The mean ± SE reported daily consumption of FV was 2.6 ± 1.5 servings. Only 11% reported consuming five or more servings per day and only 1% reported consuming seven or more. African-Americans had a significantly lower FV consumption than whites (1.87 ± 0.07 servings in whites vs 1.47 ± 0.05 servings in African-Americans; $P < 0.001$).

Of all screened, 14% reported they were not involved in any exercise and only 18% reported they exercised five or more times per week. Overall, 53% reported they exercised at least three times per week. Of those who reported they exercised (total = 649), 471 (73%) reported they exercised at least 20 minutes per session. Of all white patients, 75% reported performing some PA more than three times week, versus 46% of all African-American patients ($P < 0.001$).

When we assessed those with hypertension only, African-Americans also consumed less FV (1.90 ± 0.09 servings in whites vs. 1.35 ± 0.05 in African-Americans; $P < 0.001$) and performed less PA (65% of whites vs. 46% of African-Americans had more than three times per week PA; $P = 0.001$).

Hypertension, Awareness, Treatment, and Control

Hypertension treatment or blood pressure readings were available on 755 participants. The mean SBP was 131.2 ± 0.6 mm Hg and DBP was 79.1 ± 0.4 mm Hg (range, 94–188/50–122 mm Hg). Based on our definition, 438 (58%) had hypertension. The prevalence was higher in older participants and those with lower educational level. Prevalence also tended to be higher in African-Americans, women, and lower income participants but was not statistically significant (Table 1). Those consuming five or more servings of fruits and vegetables and those