VIEWS OF HYPERTENSION AMONG YOUNG AFRICAN AMERICANS WHO VARY IN THEIR RISK OF DEVELOPING HYPERTENSION

Objectives: To describe beliefs about hypertension and health education of young African American adults varying in their hypertension risk status.

Design: Fifty-eight African American young adults (17–20 years) were selected based on low and high risk criteria for hypertension assessed in earlier investigations of hemodynamic responses to stress. The sample included 15 high risk males, 13 low risk males, 14 high risk females, and 16 low risk females who were interviewed indepth about their hypertension beliefs and health education experiences. Variable-based matrices identified participants with similar responses.

Results: Overall, participants had a limited understanding of hypertension. For example, they linked the condition to eating a diet high in pork and fat and having a positive family history of hypertension with little acknowledgement of weight, smoking, race and sex as key contributors to hypertension onset. Distinctions were found between risk categories and along sex lines. Most high risk participants believed stress could cause hypertension. High risk females believed that they were at risk for developing hypertension but lacked prevention strategies. High risk males were generally uninformed about risk or prevention. More low risk females believed in prevention compared to few low risk males. Participants reported little formal health education about hypertension and recommended that hypertension education be improved through more effective and relevant approaches in high school health education classes.

Conclusions: These findings support the need for comprehensive and revitalized hypertension prevention programs for young African Americans. Participant views varied with hypertension risk status and gender suggesting that targeted educational efforts should reflect these differences. (*Ethn Dis.* 2009;19:28–34)

Key Words: Hypertension, African Americans, Health Disparities, Health Literacy, Qualitative Research, Chronic Disease Prevention Margaret R. Savoca, PhD; Sara A. Quandt, PhD; Conner D. Evans; Tara L. Flint; Allison G. Bradfield; Tiffany B. Morton, MS; Gregory A. Harshfield, PhD; David A. Ludwig, PhD

INTRODUCTION

In 1984, review of evidence showed that elevated blood pressure in childhood indicated the early stages of hypertension, which therefore was a risk for adult cardiovascular disease (CVD).¹ The authors of the study proposed that efforts to reduce CVD mortality would be more successful "if hypertension could be prevented in its early phases." Then as now, the early signs of hypertension appeared in African American children to a greater extent than in Whites. These disparities persist throughout adolescence and adulthood.² In 2007, a study on the prevalence of prehypertension among 6790 adolescents in Houston, Texas, found that overweight status, male sex, and African American race were independently associated with increased rates of prehypertension.³ Approximately a quarter of overweight adolescents were prehypertensive, but prehypertension rates for normal-weight and at-riskfor-overweight African American boys were 23% and 27%, compared with 13% and 15% for White boys, and 12% and 13% for African American girls, compared with 8% and 10% for White girls.

The effect of early-onset hypertension among African Americans relative to Whites can be seen in CVD death and hypertension hospitalization rates.⁴ In 2000, African Americans (aged 25– 29 years) died from CVD at almost three times the rate as Whites. Hypertension hospitalization rates among 18to 44-year-old African Americans were six times greater than hospitalizations among Whites. Lowering hypertension prevalence among young African Americans may represent the single greatest opportunity to reduce CVD health disparities.

The American Heart Association website features a special message for African Americans informing them that they are more likely to develop hypertension, will develop it at a younger age, and that once diagnosed it will be more severe.⁵ After decades of awareness, little is understood about how young African Americans absorb this message along with lifestyle guidance (reduce salt intake, avoid becoming overweight, decrease stress, and exercise regularly). Most existing research has focused on adolescents' health beliefs regarding contraception, sexually transmitted infections, HIV, and mental illness. Several studies have explored adolescent and young adult beliefs and knowledge about CVD in general,^{6–8} but only two studies have examined hypertension specifically.9,10 More information about hypertension beliefs and knowledge among young African American adults is needed to develop relevant hypertension education programs for this generation.

Since little is known about hypertension awareness among younger African Americans, we chose a qualitative approach to learn how these young adults understood hypertension in their own words. Rather than contrast views of White and African American youth, we compared young African American adults at risk for hypertension with those with lower risk to ensure that

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prevention efforts are relevant to those entering adulthood as prime targets for the early onset of hypertension.^{11,12} The purposes of this study are to describe the knowledge and beliefs about hypertension and health education experiences of young African American adults and to evaluate whether these views vary with hypertension risk.

METHODS

Study Design

This research examined two groups of African American adolescents with differing hypertension risk profiles. It was conducted in an urban/suburban county in the southeastern United States with \approx 200,000 residents, of whom 50% are African American. Participants were drawn from four prior clinical investigations that studied the mechanisms that regulate stress-induced pressure natriuresis among normotensive adolescents (aged 15–18 years).^{13–16} From these prior studies, participants were identified who met low- and high-risk criteria for hypertension. The overall aim of the research was to identify the health and hypertension beliefs and lifestyle behaviors that distinguish African American young adults with differing preclinical hypertension risk factors. The present analysis focused on participants' views about hypertension and health education.

Participants

Upon receiving institutional review board approval and beginning in August 2004, we identified 130 eligible participants from 413 African Americans who were participating in ongoing hemodynamics research conducted from January 2000 to February 2006. Potential participants were identified as at risk for early hypertension if they had at least two of the following characteristics: 1) systolic blood pressure (SBP) within the top quartile of participants who had been tested as of August 2004,¹⁷ 2) body mass index (BMI) >85th percentile based on age and sex,^{2,18,19} and 3) impaired stress-induced pressure natriuresis (ie, a change in sodium excretion $[U_{Na}V] \leq 0$ mEq/hour after a one-hour competitive video game challenge). This impaired natriuresis response to stress may be a sign of the development of hypertension in African Americans.^{15,16} Participants were categorized as low risk if they met all of the following criteria: 1) SBP within the lowest two quartiles of participants who had been tested as of August 2004, 2) BMI 15th-85th percentile based on age and sex, and 3) a positive change in U_{Na}V (>0 mEq/ hour) from baseline to stress. In addition to the risk criteria, participants were further screened for age (17 to 20 years).

In advance, we estimated that the size of the pool of past participants meeting our criteria would limit our recruitment to ≈ 60 participants. These numbers were considered sufficient for a qualitative study with a sample of a narrow age range, preselected clinical characteristics, and a single ethnicity. Therefore, we made an effort to recruit 30 participants in each risk category, with equal numbers of men and women. We sent letters to 130 qualified participants inviting them to participate. We identified six sibling pairs, and only the oldest received an invitation. Forty-seven potential participants could not be contacted by mail or phone. Nineteen others were not interested or available.

Consent was obtained from participants aged ≥ 18 years and parental consent and child's assent from those aged 17 years. All forms were sent to participants before they arrived at the testing sight. On the test day, the principal investigator and research assistant explained study requirements and participants were given another opportunity to read the forms and ask questions before signing. Each participant was told his or her weight and blood pressure readings, provided with hypertension education material (blood pressure wallet cards and information about hypertension risk and prevention),²⁰ and received a financial incentive upon completing the session.

Data Collection

In-depth, semi-structured interviews were the primary method of data collection. The interview guide was pilot tested by the research assistant under supervision of the principal investigator with two participants from each of the risk categories (not included in dataset). The interview guide included a wide range of questions regarding hypertension, health beliefs, healthcare practices, and lifestyle characteristics. The investigators conducted all interviews in private rooms. Interviews took \approx 45–75 minutes and were audiotaped. After the interview, weight and height were measured by using a digital eyelevel scale with a height rod according to established protocols.14 Blood pressure was measured three times with a mercury manometer according to standard protocol.²¹ ($U_{Na}V$ in response to a video game stressor, which was one of the criteria used to identify our participants from previous clinical research, was not measured in this present study.) This analysis uses data collected about hypertension beliefs and knowledge as well as participants' experiences with health education.

Data Analysis

All interviews were transcribed verbatim by medical transcriptionists. Research assistants coded each statement with a coding dictionary developed by the interviewers on the basis of interview questions and additional topics that emerged during the interviews. Lines in the transcripts were assigned codes such that multiple codes could be assigned to the same statement. Atlas.ti version 5.1.12 (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany) qualitative software was used to facilitate coding, retrieval, and summarizing of participants' responses to topic areas. To determine if a participant knew his or her mothers' hypertension status, we obtained information about the mother's hypertension status from her in a separate interview.

Segments coded with hypertension and *health* education were retrieved. These segments were reviewed, and each comment was further labeled with a more specific subcode, eg, hypertension family history, causes, and treatment. Summaries of subcodes were prepared for participants in each sex and risk subgroup. Matrices were constructed for each sex and risk subgroup with hypertension and health education subcodes as column labels and individual participants as the rows. These matrices provided a way to identify major response patterns found across and within groups.²² The principal investigator summarized common responses and counted these where applicable. Interrater reliability was evaluated by having two research assistants independently construct matrices from participant summaries and compare counts for each subcategory. The agreement (counts differing by no more than one participant in each subgroup) among the three investigators was 92%.

RESULTS

Participants included 29 African Americans at high risk (14 women) and 29 at low risk (16 women) (Table 1). We observed no differences in age among the groups. Regardless of sex, the high-risk groups had higher SBP, diastolic blood pressure (DBP), and BMI.

All but one of the low risk males reported living with their mother and father or stepfather as compared to half of the three other groups. Sixty-four percent of high risk females were in school as compared to 90% of the other groups. Among those participants who were not in school, only four, all in the high risk category, were unemployed. Fewer high risk males (29%) worked 10 or more hours a week while in school compared to all other groups (47%). More high risk males compared to low risk males were on or had been on a high school sports team (67% vs. 46%) and 25% of females were or had been on high school sports team.

Knowledge and Beliefs about Hypertension

The knowledge and beliefs about hypertension among the young adults in these two risk groups were organized into six categories: controllable risk factors, uncontrollable risk factors, awareness of hypertension, belief in prevention, hypertension treatment, and consequences of hypertension (Table 2). Table 2 compares the frequency of hypertension knowledge and beliefs by gender and risk groups.

Causes

Participants mentioned several controllable risk factors. Diet was reported as the primary hypertension cause by all groups, namely a diet with large amounts of fried food, pork, and fast food. Approximately half of participants mentioned salt as a specific cause of hypertension. A notable difference between the high-risk and low-risk groups was that two-thirds of high-risk participants mentioned that stress was a cause of hypertension compared with only half of lowrisk participants. One-third of high-risk men and few in the other groups mentioned that being overweight was a hypertension risk factor. Excessive alcohol intake was not mentioned. Among uncontrollable risk factors, family history was mentioned by approximately half of participants. Only 4 of the 58 participants mentioned that being African American could contribute to hypertension risk. No one indicated that being male elevated the risk of developing hypertension or commented on advancing age as a risk factor. These results reflect a limited view of the causes of hypertension, which was primarily associated with a high fat diet and high levels of stress by high risk participants. All groups failed to recognize the contributions of being overweight, male, African American, and of increasing age to hypertension risk.

 Table 1. Descriptive characteristics of 58 African American young adults who participated in a qualitative study on hypertension knowledge, 2004

Characteristic	High-risk Men (<i>n</i> =15), mean (SD)	Low-risk Men (<i>n</i> =14), mean (SD)	High-risk Women (<i>n</i> =13), mean (SD)	Low-risk Women (<i>n</i> =14), mean (SD)
Age, years	18.6 (1.1)	18.4 (1.3)	19.3 (1.3)	18.2 (1.0)
BMI, kg/m ²	31.9 (5.3)	22.3 (2.8)	34.6 (7.6)	21.7 (2.6)
Systolic blood pressure, mm Hg	120.7 (11.7)	108.4 (8.0)	116.9 (10.2)	108.1 (10.1)
Diastolic blood pressure, mm Hg	74.7 (6.6)	67.8 (6.7)	71.7 (9.2)	67.2 (5.2)
SD=standard deviation, BMI=body mass index.				

Table 2. Comparison of relative frequency of hypertension beliefs reported by 56 African American young adults who participated in a qualitative study on hypertension knowledge, 2004

	Men		Women	
Belief	High Risk	Low Risk	High Risk	Low Risk
Controllable risk factors				
High-fat diet	Н	Н	Н	Н
Stress	Н	М	Н	М
Exercise	М	М	М	L
Salt intake	М	М	М	М
Overweight	М	L	L	L
Smoking	L	L	L	L
Alcohol consumption	L	L	L	L
Uncontrollable risk factors				
Family history	М	М	М	М
Race	L	L	L	L
Sex	L	L	L	L
Age	L	L	L	L
Awareness				
Knowledge of mother's hypertension	М	L	Н	Н
Belief that hypertension cannot be cured	М	М	Н	Н
Personal risk of hypertension	М	М	Н	М
Awareness of blood pressure numbers	L	L	М	L
Warning signs: headaches	L	L	М	L
Warning signs: none	L	L	М	L
Belief in prevention	М	М	М	Н
Treatment				
Medication	Н	Н	Н	Н
Diet	М	М	Н	М
Exercise	L	L	М	L
Stress management	L	L	L	L
Consequences: heart disease/stroke	Н	Н	Н	Н
H = High Frequency				
M = Medium Frequency				
L = Low Frequency				

Awareness

Several subcategories were considered indicators of hypertension awareness. These were the belief that hypertension was not curable, knowledge that their mother had been diagnosed with hypertension, recognition of their own hypertension risk, a plausible explanation of blood pressure readings (ie, SBP between 300 and 90 and DBP between 200 and 50 with the systolic number higher than diastolic number), and whether hypertension was symptomatic.

All high-risk women and to a lesser extent low-risk women mentioned that hypertension cannot be cured. Women reported more awareness of their mother's hypertension status. Fourteen of 15 women whose mothers were diagnosed with hypertension said that they were aware of their mother's condition, compared with 5 of 12 males. Approximately 75% of high-risk women and 50% of the remaining groups mentioned that they were at risk for developing hypertension. Few participants could describe plausible blood pressure numbers. A third of high-risk women mentioned that hypertension was asymptomatic, as did a few highrisk men and low-risk women. Half of the women and a third of the men in the high-risk group and six low-risk participants mentioned that headaches were a common warning hypertension sign. In general, high-risk women appeared to have greater hypertension awareness than the other groups.

Prevention

All low-risk women mentioned that hypertension could be prevented, compared with two-thirds of other groups. For those who mentioned prevention, diet was the primary prevention strategy. "Eating healthy" meant avoiding salt, sugar, and high-fat foods; reducing portion sizes; and eating less fast food. Few mentioned eating fruits or vegetables. Approximately one-third of all groups mentioned avoiding stress or staying calm and exercising regularly as prevention strategies. Women mentioned smoking, drinking, and avoiding weight gain while men did not. High-risk women recommended discussing one's family's history with a doctor, and low-risk women mentioned having regular checkups. Those who did not believe in prevention felt this way because of their belief in a strong link between heredity and hypertension.

Treatment and Consequences

All participants mentioned medication as a way to treat hypertension, and two-thirds of participants discussed diet. Few mentioned controlling stress, maintaining a healthy weight, or increasing physical activity as treatment approaches. The two-thirds mentioned that heart attacks and strokes are the primary consequences of poorly controlled hypertension. Some participants were confused about whether stress was a cause or an effect of hypertension and whether diabetes was a consequence of hypertension. Participants reported awareness of the seriousness of the condition and its consequences.

Perspectives on Health Education

Forty-three students recalled taking the required half semester of health education (the other half of the semester was physical education). Six participated in Junior Reserve Officer Training Corps in lieu of the standard health education/physical education curricula.

Participants reported that these classes emphasized HIV and sexually transmitted infection prevention, first aid, cigarette smoking, and drug use rather than chronic disease prevention. Eleven low-risk participants and 5 high-risk participants learned about chronic disease from biology, physical science, or anatomy classes. Three-fourths of participants mentioned that more effective health education about chronic conditions, such as hypertension, is needed in schools. Suggested improvements included lectures by health professionals, testimonials from young people with hypertension, engaging videos, better informed teachers, and health fairs with appealing incentives. One-fourth of participants suggested creating more hypertension educational opportunities outside the classroom. These included conducting health-oriented youth events (concerts, community seminars, or health fairs) and featuring hypertension storylines in television series popular among young African Americans. Several high-risk participants wanted to have hypertension prevention programs available. Overall, participants felt there was room for improvement in the hypertension education provided to African American youth.

DISCUSSION

This investigation used a unique design that considered hypertension views of young African Americans who differed in their risk of developing hypertension based on prior clinical characterization. Participants had a limited understanding of hypertension. The condition was linked to eating a diet high in pork and fat with few participants acknowledging weight or smoking as risk factors. Wilson et al found that eating pork and other similar foods was a commonly held view about the cause of hypertension among middle and low income African Americans aged 18-67 years.²³ The The young people in our study believed that hypertension had recognizable symptoms and few were aware of the need for BP screening.

young people in our study believed that hypertension had recognizable symptoms and few were aware of the need for BP screening. Wilson also found that African Americans of all ages held the belief that hypertension was a symptomatic illness.²³ These African American young adults hold beliefs that are consistent with lay beliefs among the general African American population.

Our results indicate that young African Americans have a general idea of the seriousness of hypertension but may lack knowledge of their own potential risk. Many mentioned family history as risk factor, but key risk factors of race and sex were not mentioned. This finding is consistent with a 2004 report of CVD awareness among 1500 Arizona college students.⁶ African Americans selected cancer more often than CVD as their greatest health risk and identified Whites as the most likely ethnic group to develop heart disease. African American men chose sexually transmitted infections and women chose psychological disorders as the health issue they knew the most about. African Americans, along with Hispanics, ranked heart disease as the condition they knew the least about.

We compared low- and high-risk groups and considered sex differences. Women reported similar views about causes of hypertension, except that stress was mentioned more frequently by high-risk females. This group seemed to have more awareness of hypertension, while low-risk women reported stronger beliefs about prevention. Both groups of

young men described similar views. However, high-risk men indicated that stress was often as likely as diet to cause hypertension. This result suggests that stress may dominate the lives of some young African Americans more than others and translates into a heightened awareness of its effect on blood pressure. In a previous study, stress was reported as a leading cause of hypertension among African Americans (aged 18-74 years), and high-fat foods, salt, excess alcohol, or overweight/no exercise were mentioned to a lesser extent.²³ In this present research, women reported greater hypertension awareness than did men, which is consistent with previous findings.9

All young people would benefit from a more informed perspective on hypertension. High-risk women may be most receptive to hypertension prevention because of their higher degree of awareness. High-risk men were less aware of hypertension, but they bear the greatest burden of early-onset hypertension and are the least likely to seek screening or adhere to treatment.¹² Their belief in stress as a cause with few other defined points of view suggests that a comprehensive strategy to screen, educate, and monitor prehypertensive young African American men is an urgent need.

Participants stated that they lacked formal hypertension education but shared many ideas for improving hypertension awareness. They indicated a preference for education within the school settings but also offered suggestions about promoting awareness through concerts, television, and community hypertension prevention programs. These ideas suggest a small-scale social marketing approach to hypertension awareness within the high school.²⁴ A high school-centered extension of the National High Blood Pressure Education Program (NHBPEP)²⁵ could offer a cost-effective way to increase hypertension knowledge among young African Americans.²⁶ This is consistent with

NHBPEP strategy to target groups without hypertension who can support effective care among family and friends with hypertension; adopt a lifestyle to reduce their own hypertension risk; and if diagnosed themselves, manage their own care successfully.²⁶ Regardless of the approach, relevant and comprehensive hypertension health education is wanted by young African Americans as indicated by the numerous suggestions we received.

A limitation of this research may be the sample, which consisted of past participants from clinical research related to hypertension. As such, participants may have had more awareness of hypertension than a newly recruited sample. However, this sample would have reflected a more informed group of young people and represented a "bestcase" scenario. The true hypertension knowledge base among young African American adults may be even more limited. Since participants represented the extremes of hypertension risk, views of those in the middle of the risk spectrum or those who have been diagnosed with hypertension are not reflected. Future research should represent the full spectrum of young African Americans including those who are being treated for hypertension.

The present study has several strengths. First, the hypertension knowledge and beliefs of young people (aged 17-20 years) has not received much attention. Second, we compared African Americans who varied by sex and hypertension risk. For example, we saw that high-risk men and women had different levels of hypertension awareness and knowledge and may benefit from health education strategies tailored to these differences. Third, qualitative methods focused on the participants' point of view rather than their responses to questions identified through research among older African American populations. Finally, the present study can help formulate a prevention strategy for the highest-risk African American youth based on understanding differences within the community.²⁷

These results demonstrate why a revitalized public health strategy that includes messages about risk, screening, and prevention is needed to interrupt the cycle of early hypertension onset and increased risk of complications faced by generations of African Americans. Young African Americans begin adulthood with an increasing risk of hypertension.² At an age when health and lifestyle views are solidifying, providing young African Americans with relevant messages about hypertension and its effects may offer the greatest opportunity of breaking this cycle.^{1,2}

ACKNOWLEDGMENTS

This study was supported by the National Heart, Lung, and Blood Institute (R21 HL077502). We extend our deep appreciation to the participants in this study.

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