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PHYSICAL ACTIVITY RECOMMENDATION FOR HYPERTENSION MANAGEMENT: DOES HEALTHCARE PROVIDER ADVICE MAKE A DIFFERENCE?

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Background: Achieving normal blood pressure with antihypertensive medication remains an achievable goal for only $\approx 31\%$ of hypertensive patients. Physical activity is a primary lifestyle measure required to lower blood pressure in hypertensive patients, and the US Preventative Services Task force (USPSTF) recommends counseling by health care providers to promote regular physical activity. Surveys of patients suggest, however, that few healthcare providers follow the USPSTF recommendation on physical activity counseling.

Method: This article examined data on the rate of healthcare provider counseling, compliance with recommendations and the blood pressure difference associated with following recommendations to increase physical activity. Data are from the National Health and Nutritional Examination Survey III 1988–1994 (NHANES-III) of adults with hypertension. We compared the results of compliance with recommendation from the NHANES-III data to five recent clinical trials on physical activity conducted between 1991 and 2001.

Results: A third of the NHANES-III hypertensive patients received counseling to engage in physical activity to manage their hypertension, and 71% ($n=669$) followed the recommendations and had a systolic blood pressure that was an average of ≈ 3 –4 mm Hg lower than those who did not follow recommendations.

Conclusion: This study shows that fewer patients are receiving exercise counseling to help lower blood pressure and improve health outcomes. However, patients seem to follow the advice when given. Given the magnitude of poorly controlled hypertension, these findings should alert healthcare providers to find innovative means of physical activity recommendation to improve health outcomes. (*Ethn Dis.* 2008;18:278–282)

Key Words: High Blood Pressure, Physical Activity, Healthcare Provider Recommendations

INTRODUCTION

An estimated 72 million American adults and 1 billion people worldwide have hypertension.^{1,2} However, achieving normal blood pressure with antihypertensive medication remains an elusive goal for many patients. Only $\sim 31\%$ of hypertensive patients achieve acceptable blood pressure levels.^{3,4}

The primary lifestyle measure required to lower blood pressure in hypertensive patients is physical activity, which may include planned activities such as walking, running, playing basketball, and other sports as well as daily activities such as household chores, yard work, and walking the dog. Adults should get at least 30 minutes and children should get at least 60 minutes of moderate physical activity most days of the week.⁵ Other lifestyle measures to reduce blood pressure include reducing salt intake to ≤ 6 g/day, eating fewer calories, following a diet rich in fruits and vegetables, not smoking, and drinking only in moderation.^{5,6} Although genetic predisposition is a risk factor for hypertension, studies have shown that behavioral factors such as physical inactivity overshadow genetic predisposition as a cause of hypertension.⁷

Significant blood pressure reductions have been found with exercise independent of weight reduction and salt restrictions.⁸ A meta-analysis of random-

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ized controlled trials concluded that aerobic exercises reduce blood pressure in both hypertensive and normotensive persons,⁹ comparable to reductions found with some medications used for hypertension control.¹⁰ Even a 2-mm Hg reduction of blood pressure with physical activity can reduce the risk of stroke by 6% and coronary heart disease by 4% in a population at risk for these conditions.¹¹

The US Preventative Services Task force (USPSTF) recommends counseling to promote regular physical activity for all people.¹² Recommending physical activity, however, presents a challenge to healthcare providers, and following recommendations remains a challenge for most patients. Many healthcare providers lack the time and skills to provide counseling to patients. Fewer than half of physicians document counseling on physical activity to all their patients, and only $\approx 25\%$ –40% do so with hypertensive patients. In addition, patients with hypertension are five times more likely than patients without hypertension to report receiving counseling on changes in diet and salt consumption but five times less likely to report receiving counseling on exercise.¹³

Surveys of patients suggest that few healthcare providers follow the USPSTF

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recommendation on physical activity.¹⁴ In 1997, the Behavior Risk Factors Surveillance System (BRFSS) found that only 42% of adult respondents reported receiving a clinician's advice to increase physical activity levels. Approximately three-fourths of the patients who reported receiving the advice reported increasing physical activity levels, compared with half who did not receive the advice.¹⁵ Issues that prevent patients from engaging or increasing physical activity include unrealistic views of who should exercise, environmental limitations, lack of time, and physical limitations.^{16,17}

This article examines data on the rate of healthcare providers' compliance with counseling recommendations and the blood pressure difference between those who followed recommendations to engage or increase physical activity and those who did not, from the National Health and Nutritional Examination Survey III 1988–1994 (NHANES III)¹⁸ of adults with hypertension. We subsequently examined our findings in the context of the latest summary from the USPSTF on physical activity counseling by primary care providers.¹⁹ This was done to compare our findings from a national database to recent evidence-based clinical trial outcomes evaluated by USPSTF.

METHODS

The NHANES is a periodic survey conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention that uses a complex, multistage sample design. NHANES III (1988–1994), the seventh in these surveys, was designed to provide national estimates of the health and nutritional status of the noninstitutionalized population of the United States aged ≥ 2 months. The survey included a household interview, a physical examination, and laboratory tests. Blood pressure measurements were

Mean blood pressure differences between those following and not following recommendation to engage in physical activity

	Mean	95%CI	P Value
Now Exercising	Systolic BP		
Yes (n= 669)	125.61	(122.71–128.57)	<0.027
No (n= 276)	129.38	(126.89–131.87)	
Now Exercising	Diastolic BP		
Yes (n= 669)	75.24	(73.74–76.75)	<0.67
No (n= 276)	75.76	(74.08–77.45)	

made according to American Heart Association guidelines.²⁰ We looked at adults aged ≥ 20 years with diagnosed hypertension, including those with high-normal blood pressure or prehypertension (systolic blood pressure 130–139 mm Hg or diastolic blood pressure 80–89 mm Hg) for whom nonpharmacologic interventions might have been tried before starting medications.

Data Analysis

The NHANES data were weighted to account for the unequal probability of selection, nonresponse, and oversampling of certain target groups. Sampling weights were used to calculate population estimates; sampling strata and primary sampling units were accounted for in estimating variances and testing for significant differences. All analyses were conducted by using STATA 7.0 (StataCorp LP, College Station, Texas), a statistical package that adjusts all estimates for the complex design of NHANES.¹⁹

Five additional studies conducted from 1991 through 2001 were reviewed for outcomes after following recommendations to engage in physical activity.^{20–24} Selection was based on criteria of the USPSTF for good internal validity (the trial met all criteria and was likely to be valid) or fair internal validity (the study was possibly or probably valid depending on severity of its flaws). Outcomes were evaluated on the basis of the number of people who met the *Healthy People 2010* goal of physical activity after one month or more.^{14,18}

RESULTS

Of the 17,474 people aged ≥ 20 years who completed the household interview, physical examination, and laboratory blood draw in NHANES III, 27% (n=4686) reported being told they had hypertension. Of these, 33% (n=936) reported having received recommendations to engage in or increase physical activity to help lower their blood pressure, and 71% of these (n=669) reported following their doctor's recommendations. Mean systolic blood pressure was significantly lower (125.6 mm Hg) in those who followed the recommendation than in those who did not (129.4 mm Hg, $P < .027$) (Table). No difference in mean diastolic blood pressure was observed between those who followed recommendations and those who did not.

The five studies we reviewed were conducted between 1999 and 2001 in the community by healthcare providers. Although the methods and duration of counseling varied, the ultimate goals were to improve physical activity in community-dwelling individuals as measured by *Healthy People 2010* standards. Of the five studies, two were rated as good per USPSTF standards,^{20,21} and three were rated as fair.^{22,24}

One study did not show any improvement in physical activity after 6 months.²³ The results of those that reported an improvement in physical activity are as follows: 28% of those who received recommendations compared with 23% of the control group met study goals after 8 months;²⁰ 37%

of participants reported an increase in physical activity in two months;²² 14.3% of women and 18.5% of men reported increase in physical activity after 24 months;²¹ and one reported a statistically significant increase in physical activity after 6 months.²⁴

DISCUSSION

Approximately 27% (4686) of the participants in NHANES III had been told by a healthcare provider that they had hypertension. Though other studies have reported similar findings, this figure is lower than current reports, which indicate that nearly one out of three American adults has hypertension.^{3,25} One-third of the patients with hypertension in NHANES III reported having received a physical activity recommendation from their healthcare providers. This number is lower than the 42% reported in the Behavioral Risk Factor Surveillance Survey (BRFSS), but comparable to the rate of 34% reported by the National Health Interview study.^{15,26}

Although only one-third of those reporting hypertension received recommendation to engage in physical activity to manage their hypertension in NHANES III, 71% ($n=669$) of patients who received such recommendations reported following the recommendations. This high rate of engaging in physical activity after a healthcare providers' recommendation is similar to that found in the BRFSS study, in which $\approx 75\%$ reported following recommendations to exercise after general exercise counseling. The finding of high levels of initiating exercise suggests that patients are receptive to exercise counseling and thus may experience better health outcomes.

We found that patients in the NHANES III who reported following physical activity recommendations had a lower mean systolic blood pressure of $\approx 3-4$ mm Hg on average. Although

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Eleyse Forret MD		
329 Comeon Road		Hesican, IN 46217
Name _____ Address _____		
Refill NR, 1 2 3 4 Void after _____ Date: _____		
Signature: _____		
Physical Activity Recommendations		
Type: Walking		
Where: Around the neighborhood		
Rate: 20 minutes four times a week		

Fig 1. Sample of Prescription for HTN and Physical Activity

this does not establish cause and effect, other studies have shown that a decrease of 2–3 mm Hg in blood pressure can delay the progression of hypertension.^{27,28} Compared with the NHANES III findings on following recommendations, we found as high as 37%²² and low as 14%²¹ of participants met the goals of *Healthy People 2010*⁵ for following recommendations to engage or increase physical activity in the clinical trials reviewed. One of five trials reported no effect in increase of physical activity.²³

Thus, in the NHANES III studies, the higher rates of following recommendations was still a small fraction of those who could benefit from physical activity. Even recent clinical studies did not show that more patients followed recommendations to engage or increase physical activity. Given the magnitude of poorly controlled hypertension, these findings should alert healthcare providers to increase physical activity recommendations for hypertension management. Experts on hypertension management view current poor hypertension control rates as a result of “therapeutic inertia” on the part of healthcare providers.^{29,30}

Studies have shown that a recommendation to increase or engage in physical activity combined with a prescription to engage in physical activity is

more effective than a recommendation alone.^{22,31–33} Given the current state of poor hypertension control, we recommend that an exercise prescription should be included on a regular prescription pad for all patients with hypertension. This will remind healthcare providers to recommend physical activity as part of treatment and will reinforce to patients the value of physical activity in management of hypertension. Figure 1 has a sample of what such a prescription pad could look like. Completing such a prescription for all hypertensive patients will require more effort on the part of the healthcare providers but may be beneficial in the long run.

Current research efforts are focused on the aggressive use of multiple pharmacologic methods to control hy-

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pertension. Some of this research effort should be extended to investigate effective ways to recommend physical activity and help patients follow these recommendations as part of hypertension management. On the basis of the results of this study, current research has not helped move the science in this field forward, and physicians continue to underuse a valuable tool (physical activity recommendations) as part of hypertension management.

Finally, policy should support reimbursement of counseling to promote behavioral modification. Current trends in reimbursement favor invasive and complex procedures over interventions that involve behavior change. However, if done effectively, behavior change may be less expensive, affordable, and prevent disease.

Limitations

One of the limitations of this study is that the original NHANES III (1988–1994) data may be considered old. However, the database was a good source for comparing self-reported data to recent data on whether participants followed physical activity recommendations. Self-reported data are also inherently limited. Patients' recollection may be hampered by length of time since recommendations were made, and no attempts were made to verify time frames for when recommendations were made and followed. We also had no means to verify from their healthcare providers whether they actually recommended exercise for high blood pressure, and thus we cannot determine whether the rates were underreported or overreported. Patient self-report surveys are, however, more accurate and preferable to healthcare provider surveys for preventive services,³³ as healthcare providers tend to overreport. Furthermore the study was a cross-sectional study, and thus causal inferences could not be determined. A strength of the NHANES III data is that the survey was nationally representative. Compar-

ing the NHANES III data with the five clinical studies was a qualitative exercise because they all differed in their methods. Finally, we are in the process of incorporating the suggestion to include exercise recommendations on prescription for hypertension, and we do not yet have data to prove how effective the process will be.

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Manuscript draft: Halm, Amoako

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