Awareness, Knowledge, and Attitudes of Older Americans About High Blood Pressure

Implications for Health Care Policy, Education, and Research

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Background: The prevalence of high blood pressure (HBP), particularly isolated systolic hypertension, rises with age, whereas control rates decline.

Methods: Since awareness, knowledge, and attitudes about HBP can influence control, information on these factors was obtained by telephone interview of a nationally representative sample of 1503 adults 50 years or older.

Results: Among Americans 50 years or older, 94% had at least one blood pressure (BP) measurement during the past year, yet 46% did not know their BP. Only 27% acknowledged current HBP, although 37% reported taking antihypertensive medications. Systolic hypertension was probably underrecognized, since 30% who reported a value of 140 mm Hg or higher indicated they did not have HBP. Among those acknowledging current HBP, 80% reported taking medications “precisely as prescribed.” Of the approximately 20% of hypertensive patients no longer taking medications or taking fewer medications than prescribed, cost was a major factor in approximately 1 in 5 or roughly 4% of the total. Sixty percent of patients receiving treatment indicated that medications alone do not control HBP. Most survey respondents (≥90%) concurred that several lifestyle changes lower BP, 75% reported a lifestyle change; and 61% indicated it lowered their BP. When asked what HBP information was most important, 34% reported alternative therapies and 28% reported prevention strategies.

Conclusions: Limited awareness of systolic hypertension emerges as a greater barrier to BP control than cost of medications in Americans 50 years or older. Many older Americans prefer to integrate traditional, complementary, and alternative strategies. Education addressing limited awareness of systolic hypertension, policies facilitating a more holistic management approach, and research identifying the most effective innovations may improve outcomes.

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The self-report of current hypertension by 27% of older Americans is much lower than prevalence rates reported previously. The discrepancy is partially semantic, since 37% of the entire sample reported taking medications for HBP, and 29% of those who acknowledged taking medications indicated that they did not currently have hypertension. Those who stated they were taking BP medications but did not have HBP were more likely to know their BP values compared with the overall sample (76% vs 54%, P < .001). The mean BP values reported by this group were, in fact, lower than for the group that was taking medication and acknowledged having HBP currently (133 ± 1/76 ± 1 vs 142 ± 1/81 ± 1 mm Hg, P < .001).

The terms HBP and hypertension may also affect self-reported prevalence rates. Questions about awareness were framed in terms of HBP. When asked for a response to the statement, “HBP and hypertension are the same medical condition,” only 55% agreed.

Among the 54% of respondents who reported knowing their BP value, the percentages within the normal, high normal, and hypertension stages 1, 2, and 3 are depicted in Figure 2. Based on the self-reported values, only 43% had a normal systolic BP (< 130 mm Hg), whereas 77% had a normal diastolic BP (< 85 mm Hg). Conversely, 36% had stage 1 or greater systolic BP elevation, whereas only 14% had stage 1 or greater diastolic BP elevation. The self-reports are consistent with epidemiologic findings of a disproportionate rise of systolic BP and isolated systolic hypertension in individuals older than 50 years.

The concern about systolic hypertension in older Americans is heightened by the fact that the relatively low BP control rates in older Americans could provide a rational basis for effective intervention. The knowledge, attitudes, and health beliefs of individuals can play a critical role in BP control. This survey was conducted to quantify awareness, knowledge, attitudes, and health behaviors regarding hypertension among adults 50 years and older. This information may help shape health care policy, education, and research aimed at reducing the adverse consequences of hypertension in older adults, which is the most rapidly growing segment of the US population.

**METHODS**

The survey was developed and directed by the National Council on the Aging (Washington, DC) as part of its ongoing studies on the health and vital aging of older men and women. The sampling and telephone interviews were conducted by Voters Consumer Research under the supervision of the Seniors Research Group (Livonia, Mich).

**SAMPLE GROUP**

A national telephone list of households in which an adult 50 years or older was likely to live was used for this study as identified by census and population-based directories. Available information indicates that 94% of households have telephones and that 70% are listed in directories. Telephone surveys tend to undersample the lowest- and highest-income groups, since the former group is less likely to have telephones and that the latter group is more likely to have unlisted numbers. Among the households with listed numbers, approximately half are linked to information (eg, age and sex) on at least one member. Approximately 27% seem to have at least one person 50 years or older, which is similar to US Census Bureau statistics.

**SURVEY DETAILS**

The survey on BP in older Americans was conducted using random dialing of listed telephone numbers from January 12-24, 2000. A nationally representative sample of 1503 adults 50 years or older was obtained for a response rate of 77%. Census-based statistical weights were used to ensure that the sample matched the US population for sex, age, and region. African Americans and Hispanics were oversampled to increase confidence in obtaining representative information on these 2 groups. The interview included 60 questions and required approximately 16 minutes to complete.

**DATA ANALYSIS**

The percentage of respondents who provided specific answers to each question was assessed for the total survey sample and with stratification by variables such as ethnicity and age. The 95% confidence intervals are ±3.3% for whites and ±5.6% for African Americans and Hispanics.

**RESULTS**

The race or ethnicity, age, sex, and regional location of the respondents in the survey and US population are provided in Table 1. African Americans and Hispanics were oversampled to provide more reliable estimates. Employment status, income, education, and marital, household, and insurance status are given in Table 2, Table 3.

### Table 1. Demographic Characteristics of 1503 Survey Participants Compared With the US Population

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Survey Sample, %</th>
<th>US Population, %</th>
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</thead>
<tbody>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>59</td>
<td>84</td>
</tr>
<tr>
<td>African American</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>Hispanic</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>44</td>
<td>46</td>
</tr>
<tr>
<td>Female</td>
<td>56</td>
<td>54</td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-59</td>
<td>31</td>
<td>40</td>
</tr>
<tr>
<td>60-69</td>
<td>33</td>
<td>28</td>
</tr>
<tr>
<td>≥70</td>
<td>34</td>
<td>32</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>Midwest</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>Northeast</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>West</td>
<td>20</td>
<td>21</td>
</tr>
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</table>
that only 27% responded affirmatively to the question that the top rather than the bottom number determines the presence of HBP.

Although the question is appropriate from epidemiologic data indicating that systolic BP is positively and diastolic BP is negatively related to adverse outcomes, especially among individuals 60 years and older, the national guidelines on diagnosing and staging hypertension include the same diastolic BP criteria for all age groups. Despite the limitation of the question, this and other information in the survey is consistent with lack of awareness and concern about the importance of an elevated systolic BP. For example, among the respondents who knew their BP and reported the systolic values of more than 140 mm Hg, 30% stated they did not have HBP, including 36% in the 140 to 159 mm Hg range, 11% in the 160 to 179 mm Hg range, and 18% in the more than 180 mm Hg range.

HEALTH RISKS OF HBP AND BENEFITS OF BP REDUCTION

Although most respondents (68%) indicated that HBP was not at all a serious health concern, most of them reported having a normal BP. Their relative lack of concern is consistent with the finding that only 14% of those who reported their BP was normal believed they were not at all a serious health concern, most of them reporting HBP as a consequence of hypertension is 90% based on the Framingham data. Among patients reporting HBP, 70% were concerned. The fact that 82% agreed that small decreases in HBP make a significant difference in health indicates that many of those with normal BP are, in fact, aware of the dangers of HBP and the benefits of lowering it.

The responses to a question on the most important factor causing HBP, in order of decreasing frequency, were 34% inherited factors, 21% did not know or refused to respond, 18% personal decisions over a lifetime, 16% aging, 7% actions taken by others, and 4% chance (blind luck). Among those acknowledging current HBP, 32% reported elevated cholesterol levels and 26% reported diabetes mellitus. Among individuals who never had HBP, only 20% reported high cholesterol levels and 8% diabetes mellitus. Ninety-four percent of respondents indicated that stroke was a consequence of hypertension, 86% heart disease, and 49% kidney failure. Nine percent identified osteoporosis and 11% Alzheimer disease as complications of HBP.

USE OF ANTIHYPERTENSIVE MEDICATIONS

Overall, 91% of those who acknowledged having a current diagnosis of HBP reported taking medications to lower it. Among the 91% undergoing treatment, 90% reported taking their antihypertensive medications “precisely as prescribed,” 8% responded usually, and 2% sometimes. Among those who had received antihypertensive medications, the percentage of patients who indicated they were very or somewhat satisfied with their physician’s explanation was 93% on use of the medication, 82% on consequences of non-adherence, and 77% on adverse effects. Among 551 respondents taking BP medications, insurance paid all of the expense for 13%, most of the cost for 42%, some for 20%, none for 18%, and 7% did not know or refused to respond. Among 57 hypertensive individuals not taking medication “precisely as prescribed,” the most common reason was forgetfulness (n = 26; 46%) followed by BP under control (n = 23; 40%), do not like taking medications (n = 19; 33%), adverse effects (n = 17; 30%), BP controlled in other ways (n = 16; 28%), and medications too expense and lack of insurance coverage (n = 9; 16%). Among those who had previously taken but were no longer taking medications for HBP (n = 55), 47 (86%) indicated BP was under control, 19 (35%) did not like taking medications, 16 (29%) did not like the adverse effects, and 13 (24%) indicated the medications were too expensive.

In response to the question, “Can BP medication alone control HBP?” 15% strongly agreed, 21% some-
what agreed, 22% somewhat disagreed, and 38% strongly disagreed. Thus, 60% of older Americans do not think that medications alone can control BP. Most perceived several lifestyle changes as very or somewhat effective in lowering BP (Table 3). Moreover, 61% reported having made a lifestyle change that lowered their BP. Sixty percent were very satisfied and another 23% somewhat satisfied with their physician’s explanation of how lifestyle changes help control BP.

INFORMATION ON HBP

When older Americans were asked what information on HBP was most important, the responses were alternative therapies to prevent and treat HBP (34%), preventing HBP (28%), aging and HBP (15%), new medications to treat HBP (8%), none (5%), and do not know or refused to respond (10%). When asked where they would get this information, 28% indicated newsletters, medical journal, or health department; 21% identified brochures or articles read at home, a physician’s office, or hospital; 13% indicated the library; 12% indicated only at the physician’s office; 11% indicated a medical Web site; 9% indicated a hospital; 8% indicated a pharmacist; and 7% indicated television.

The greatest growth in the US population is among those 50 years and older. The prevalence of hypertension, especially isolated systolic hypertension, rises sharply with...


Table 4. Attitudes of 1503 Older Americans on Various Lifestyle Factors and Blood Pressure

<table>
<thead>
<tr>
<th>Lifestyle Factor</th>
<th>Very Effective</th>
<th>Somewhat Effective</th>
<th>Not Effective</th>
<th>Do Not Know or Refused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop smoking</td>
<td>75</td>
<td>15</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Exercise ≥3 times per week*</td>
<td>74</td>
<td>20</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Lose weight‡</td>
<td>72</td>
<td>20</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Reduce stress‡</td>
<td>61</td>
<td>32</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Reduce salt intakeð</td>
<td>56</td>
<td>34</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Reduce alcohol</td>
<td>46</td>
<td>34</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Take aspirin daily</td>
<td>27</td>
<td>35</td>
<td>21</td>
<td>17</td>
</tr>
</tbody>
</table>

*Cited as most important by 38%.
‡Cited as most important by 23%.
†Cited as most important by 21%.
§Cited as most important by 14%.

age and comprises a major health burden for older individuals. Unfortunately, hypertension control rates, particularly for systolic hypertension, decline with age. Systolic hypertension is a major risk factor for coronary heart disease, congestive heart failure, stroke, and end-stage renal disease. Given these facts, the adverse health and economic consequences of hypertension are likely to grow substantially in the years ahead unless control of systolic hypertension improves.

Most older individuals (94%) had their BP measured within the past year, and 81% had their BP measured in the past 4 months. However, almost half do not know their BP, and even fewer know their cholesterol level. Of those who report knowing their BP, it is likely they are correct, since normal systolic BP of less than 130 mm Hg was reported by only 43%, whereas 77% reported a diastolic BP of less than 85 mm Hg. Moreover, 30% who reported a systolic BP of 140 mm Hg or higher indicated that they did not currently have HBP.

The apparent underappreciation for systolic hypertension in this sample (Table 3) probably contributes to the low prevalence of current hypertension by self-report (Figure 1) compared with the NHANES III prevalence rates of 50% and higher for this age group in which BP was measured. The low self-reported prevalence of hypertension is also partially semantic, since 37% of the sample reported taking antihypertensive medications, although only 27% reported they currently had HBP. Moreover, most questions were framed in terms of HBP, and only 55% agreed that hypertension and HBP were the same.

Although most who acknowledge a current diagnosis of HBP report taking medications precisely as prescribed, 60% do not think that medications alone will control HBP. This attitude may be partially explained by the fact that approximately 40% of health care practitioners are unfamiliar with treatment guidelines for hypertension and a similar proportion would not initiate or increase treatment for a systolic BP of less than 160 mm Hg. Thus, most older Americans with elevated systolic BP readings are not receiving medications that control their BP, although most have insurance and are seen in a medical care setting an average of 4 times annually.

Since many older Americans look to their physicians for information and guidance, the knowledge, attitudes, and practice patterns of physicians about systolic hypertension probably contribute to the relatively low levels of awareness and concern of their patients regarding this condition. The clinical facts on the low control rates for systolic hypertension are consistent with the belief of older Americans that medications alone will not control HBP, despite evidence from clinical trials indicating that control rates of 60% to 70% are attainable with medications.

According to the health belief model, attitudes about the relative lack of efficacy of medications identified in this study may partially explain the comparatively low long-term adherence rates with antihypertensive therapy reported previously. The very high self-reported rates of perfect medication adherence by 80% of older Americans acknowledging current HBP are remarkable. Previous studies indicate that approximately 40% of hypertensive patients who report taking 100% of their antihypertensive medications are, in fact, taking less than 75% by pill count. Although the proportion of this sample overreporting medication adherence is unknown, noncompliance with prescribed medications probably exceeds the level reported.

For participants in this survey who reported not taking medications at all (approximately 9% of current or ever treated) or as prescribed (also approximately 9% of current or ever treated), cost is a significant issue for 15% to 23%. Thus, only approximately 4% of older Americans reported that cost was a major determinant to adherence, although insurance paid some to all of medication expenses for just 75%. In fact, cost of medications was cited less frequently as a contributor to nonadherence than BP under control, do not like taking medications, and adverse effects. This survey may underestimate the contribution of medication cost to nonadherence, since individuals without a telephone were not included. Furthermore, although the survey response rate of 77% was excellent, cost may have been a greater issue for the 23% who refused to participate. Nevertheless, the findings are consistent with another study reporting that efficacy and adverse effects are more important issues to elderly patients than cost of medications.

Older Americans indicate that several lifestyle changes are effective in lowering BP. Consonant with the health belief model, 75% reported making a lifestyle change, more
than 60% of whom indicated that change lowered their BP. Older Americans are especially interested in new information on lifestyle change and alternative medical therapies for treating and preventing hypertension.

Most older Americans correctly identified stroke and heart disease as complications of hypertension. However, renal disease is not as clearly linked with hypertension in the minds of older Americans. Most answered correctly that hypertension per se does not cause Alzheimer disease. Another question that was not asked could have assessed knowledge that HBP contributes to cognitive decline with aging. Awareness that antihypertensive treatment reduces cognitive decline with aging and that diuretics reduce bone loss may get more physicians to prescribe and patients to undergo evidence-based therapy.

The results of this survey may have important implications for health care education, policy, and research. Older patients may benefit from accurate information on the risks of systolic hypertension and the benefits of treatment, which include reductions in stroke, myocardial infarction, and congestive heart failure. Older hypertensive patients tolerate treatment as well as younger individuals, and quality of life seems unchanged or improved.

Older Americans are seeking information on alternative approaches for treating and preventing hypertension. They take medications (Figure 2) but are interested in lifestyle and alternative approaches for the prevention and treatment of HBP (Table 4). Thus, therapeutic strategies that encourage complementary lifestyle change and incorporate some of the vast array of alternative therapeutic approaches as an adjunct to antihypertensive medications are likely to engender the most effective and enduring therapeutic alliance between the older patient and his or her health care practitioner. Policy initiatives to facilitate the integration of complementary and alternative approaches along with traditional therapeutic strategies to treat and/or prevent HBP in older individuals should be linked to research on the best methods for translating the most effective innovations into clinical practice.

Older Americans seem to be increasingly aware of cardiovascular risk factors, including high cholesterol and diabetes (Table 2). Their self-reports confirm the epidemiologic evidence that cardiovascular risk factors cluster. The cardiovascular risk factor cluster, or metabolic syndrome, increases as a function of age and affects more than 40% of Americans after the age of 50 years. An even greater awareness of BP, cholesterol, and glucose (hemoglobin A1C) values and the treatment goals on the part of physicians and patients for each of these variables may be helpful in optimizing adherence and limiting complications.

In summary, this survey suggests that limited awareness of systolic hypertension is a greater barrier to control than cost of medications in Americans 50 years or older. Although most older Americans who acknowledge having HBP take medications, many prefer to integrate traditional, complementary, and alternative strategies. Educational programs addressing limited awareness of systolic hypertension, policy initiatives facilitat-

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