Insurance Status Among Adults With Hypertension—The Impact of Underinsurance

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Background—Hypertension is a major risk factor for heart disease and stroke. Health insurance coverage affects hypertension treatment and control, but limited information is available for US adults with hypertension who are classified as underinsured.

Methods and Results—Using Behavioral Risk Factor Surveillance System 2013 data, we identified adults with self-reported hypertension. On the basis of self-reported health insurance status and health care–related financial burdens, participants were categorized as uninsured, underinsured, or adequately insured. Proxies for health care received included whether they reported taking antihypertensive medications and whether they visited a doctor for a routine checkup in the past year. We assessed the association between health insurance status and health care received, adjusting for selected sociodemographic characteristics. Among 123,257 participants from 38 states and District of Columbia with self-reported hypertension, 12% were uninsured, 26% were underinsured, and 62% were adequately insured. In adjusted models using adequately insured participants as referent, both uninsured (adjusted odds ratio, 0.39; 95% CI, 0.35–0.43) and underinsured (0.83, 0.76–0.89) participants were less likely to report using antihypertensive medication than those of adequately insured participants. Similarly, adjusted odds ratio of visiting a doctor for routine checkup in the past year were 0.25 (0.23–0.28) for those who were uninsured and 0.78 (0.72–0.84) for those who were underinsured compared to those with adequate insurance.

Conclusions—Uninsured and underinsured participants with hypertension were less likely to report receiving care compared to those with adequate insurance coverage. Disparities in health care coverage may necessitate targeted interventions, even among people with health insurance. (J Am Heart Assoc. 2016;5:e004313 doi: 10.1161/JAHA.116.004313)

Key Words: hypertension • insurance status • underinsured • using antihypertensive medication • visiting doctor office within past year

Hypertension affects one third of adults in the United States and is a major risk factor for heart disease and stroke, the first and fifth leading causes of death. Although awareness and treatment of hypertension have improved in recent decades, just over half (53%) of adults with hypertension have their blood pressure (BP) under control. Those who report barriers to health care are less likely to have their BP controlled than those who report no barriers. In addition, awareness of hypertension is higher among those who report adequate health care access. We previously estimated that around 20% of US adults with hypertension reported barriers to health care, with significant geographical and sociodemographic disparities, and having no health insurance was the most important barrier to health care access.

However, having health insurance does not guarantee accessible to adequate care. Those who have health insurance coverage but still report financial barriers in getting care may forgo or delay necessary care, which has historically been defined as underinsured. Although less is known about the impact of being underinsured than that of having adequate or no insurance, previous reports found that people who were classified as underinsured had similar adverse health impacts to those classified as uninsured. Limited information is available on people with hypertension across health care insurance categories. The objective of this study...
was to assess health care use and health insurance status among people with hypertension.

Methods

Data

The Behavioral Risk Factor Surveillance System (BRFSS) is an annual health surveillance system that conducts telephone surveys to track health conditions and health-related behaviors in all 50 US states, three Trust Territories, and the District of Columbia (DC). These surveys have been conducted by Departments of Health from each state and territory, with assistance from the Centers for Disease Control and Prevention (CDC), since 1984. BRFSS applies a random-digit dialing method to obtain a sample of adults (aged 18 years or older) who represent the civilian, noninstitutionalized population. Detailed information is available at www.cdc.gov/brfss. In 2013, the survey was conducted with both landline and cell phones. The core component was conducted in all 50 US states, DC, Guam, and Puerto Rico, and the optional module “Health Care Access” was used by 38 states, DC, and Puerto Rico. We report findings from this module in 38 US states (Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, and Wisconsin) and DC. In 2013, the BRFSS state median response rate was 46.4% and ranged from 29.0% to 60.3%.

We report only on participants with self-reported hypertension, defined by an affirmative response to the question, “Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?” Participants with borderline hypertension or prehypertension, as well as women who were told they had hypertension only during pregnancy, were not included.

Health insurance status was defined by the question, “Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans, such as Medicare or Indian Health Services?” Those who answered “no” were categorized as “uninsured.” Those who answered “yes” were then asked the following four questions: (1) “Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?”; (2) “Was there a time in the past 12 months when you did not take your medication as prescribed because of cost? Do not include over-the-counter medication.”; (3) “In the past 12 months was there any time when you did not have any health insurance or coverage?”; and (4) “Do you currently have any medical bills that are being paid off over time?” Participants who answered “yes” to any of these 4 questions were categorized as “underinsured.” Participants who answered “no” to all these questions were categorized as “adequately insured” using classifications and terminology from previous reports.

Health care received was defined using the following questions: (1) using antihypertensive medication—participants answering “yes” to the question, “Are you currently taking medicine for your high blood pressure?”; (2) visited a doctor within the past year for routine care—participants who answered “within past year (anytime less than 12 months)” to the question, “About how long has it been since you last visited a doctor for a routine checkup? (A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition).”

Sociodemographic characteristics collected were age (18–44, 45–64, and ≥65 years), sex, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and non-Hispanic other), level of education (less than high school, high school graduate, some college, and college graduate and above), and household income (<$25 000, $25 000–$49 999, or ≥$50 000). Comorbid conditions collected were self-reported coronary heart disease (CHD), stroke, and diabetes mellitus. Self-reported height and weight were used to determine body mass index (BMI) in kg/m², which was categorized as normal weight (<25.0), overweight (25.0–29.9), or obese (≥30.0). The BRFSS survey was approved by CDC institutional review board. We used the publically available data set without any personal identifiable information.

Statistical Analysis

We assessed the distributions of health insurance status (uninsured, underinsured, and adequately insured) overall and by sociodemographic characteristics. We then measured the crude and age-standardized prevalence of using antihypertensive medications and visiting a doctor in the past year by health insurance status, using the 2000 US Census standard projected population, with age distribution 18 to 24, 25 to 44, 45 to 64, and ≥65 years as standards. To account for potential biases introduced by Medicare eligibility, we then assessed the age-stratified prevalence (18–64 years, ≥65 years) by insurance status.

Using logistic regression models with “adequately insured” as the referent, we assessed the odds of using antihypertensive medications and visiting a doctor within the past year for routine care by health insurance status, while adjusting for age, sex, race/ethnicity, education, income, and comorbidity of CHD, stroke, diabetes mellitus, and obesity (those with BMI ≥30). All analyses accounted for the BRFSS complex sample design by using SAS-callable SUDAAN (version 10; Research
Triangle Institute, Research Triangle Park, NC). All estimates are reported as weighted estimates according to BRFSS sampling design variables.

Results

In 2013, 365,688 adults from 38 states and DC responded to the BRFSS health care access module, 364,626 (99.7%) responded to the self-reported hypertension question, and 147,788 reported that they had hypertension. The estimated prevalence of self-reported hypertension was 32.5% (95% CI, 32.2–32.8%). Of the 147,788 participants with self-reported hypertension, 25,711 (17.2%) were missing data on covariates and were excluded. The final analytic sample was 122,077. Prevalence of self-reported hypertension was 32.6% (95% CI, 32.3–32.9%). In general, compared to respondents without hypertension (who were excluded), those with self-reported hypertension were more likely to have insurance (88% vs 81%). However, the percentage of underinsurance and adequate insurance were also higher among respondents with hypertension compared to those without (26% vs 22% for underinsurance and 62% vs 59% for adequate insurance).

Among the participants with hypertension, 12.1% were uninsured, 26.3% were underinsured, and 61.6% were adequately insured. Insurance status by demographic characteristics is presented in Table 1. Younger participants (age, 18–24) had the highest percentage of being uninsured compared to the other ages. Non-Hispanic blacks had the highest percentage classified as underinsured, whereas Hispanics had the highest percentage of uninsured. The percentage of adequately insured increased with level of education and household income.

Table 2 shows that participants who were uninsured and underinsured had a significantly lower unadjusted prevalence of using antihypertensive medications and visiting a doctor’s office for a routine checkup in the past year than those with adequate insurance. After age adjustment, no difference was noted between underinsured and adequately insured participants. When the estimates were stratified by age (18–64 and ≥65 years), the difference between underinsured and...
adequately insured was observed for visiting a doctor within 1 year, but not using antihypertensive medicine for both age groups (Table 2). In adjusted logistic regression analyses, we assessed the odds of antihypertensive medication use and visiting a doctor within the past year by insurance status, using adequately insured as the referent, adjusting for age, sex, race/ethnicity, education, income, and history of diabetes mellitus, CHD, stroke, and BMI (Table 3). Compared to adults classified as adequately insured, those who were uninsured were 61% less likely to report antihypertensive medication use and 75% less likely to have visited the doctor within the past year. Adults who were underinsured were 17% less likely to report antihypertensive medication use and 22% less likely to have

Table 2. Crude, Age-Standardized, and Age-Stratified Percentage* of Using Antihypertensive Medications and Visiting the Doctor for Routine Checkup Within 1 Year, BRFSS 2013

|                     | Uninsured | Underinsured | Adequately Insured |
|---------------------|-----------|--------------|-------------------|
| **Total**           |           |              |                   |
| Crude percentage    |           |              |                   |
| Using antihypertensive medicine | 49.5 (47.6–51.4) | 75.1 (74.0–76.2)† | 81.7 (81.1–82.3) |
| Visit doctor within 1 year | 51.4 (49.5–53.4) | 80.9 (80.0–81.8)† | 85.9 (85.4–86.5) |
| **Age-standardized percentage** |           |              |                   |
| Using antihypertensive medicine | 46.8 (45.1–48.6) | 62.4 (61.0–63.8) | 61.6 (60.5–62.8) |
| Visit doctor within 1 year | 53.7 (51.5–55.9) | 78.0 (76.5–79.5) | 79.6 (78.5–80.8) |
| **Age-stratified**  |           |              |                   |
| 18 to 64 years      |           |              |                   |
| Using antihypertensive medicine | 48.2 (46.2–50.1) | 70.0 (68.7–71.3)† | 72.2 (71.2–73.2) |
| Visit doctor within 1 year | 50.5 (48.5–52.4) | 78.6 (77.4–79.6)† | 81.6 (80.7–82.4) |
| ≥65 years           |           |              |                   |
| Using antihypertensive medicine | 86.7 (80.1–91.4) | 92.2 (91.0–93.1) | 93.2 (92.8–93.6) |
| Visit doctor within 1 year | 80.0 (72.7–85.7) | 89.9 (87.6–90.0)† | 91.2 (90.7–91.8) |

*Percentages were obtained through SUDAAN “PROC DESCRIPT” statement and P values were obtained by t test. Because there were multiple comparisons, Bonferroni correction was applied. We used 2000 US projected population for age-standardized estimates. BRFSS indicates Behavioral Risk Factor Surveillance System.

†P<0.01 and ‡P<0.05 compared with adequately insured.
§P<0.01 compared with underinsured.

Table 3. Total and Age-Specific Adjusted* Odd Ratios of Using Antihypertensive Medications and Visiting the Doctor Within the Past Year by Insurance Status, Using Underinsured as Referent Among Adults With Self-Reported Hypertension, BRFSS, 2013

|                     | Uninsured | Underinsured | Adequately Insured |
|---------------------|-----------|--------------|-------------------|
| **Total**           |           |              |                   |
| Using antihypertensive medicine | 0.39 (0.35–0.43)† | 0.83 (0.76–0.89)† | 1.00 |
| Visiting the doctor within 1 year | 0.25 (0.23–0.28)† | 0.78 (0.72–0.84)† | 1.00 |
| **18 to 64 years**  |           |              |                   |
| Using antihypertensive medicine | 0.40 (0.35–0.45)† | 0.86 (0.79–0.94)† | 1.00 |
| Visiting the doctor within 1 year | 0.26 (0.23–0.29)† | 0.80 (0.73–0.88)† | 1.00 |
| **≥65 years**       |           |              |                   |
| Using antihypertensive medicine | 0.49 (0.30–0.80)† | 0.79 (0.67–0.94)‖ | 1.00 |
| Visiting the doctor within 1 year | 0.44 (0.29–0.67)† | 0.77 (0.66–0.91)‖ | 1.00 |

*Adjusted for age, sex, race/ethnicity, education, income, history of diabetes mellitus, CHD, stroke, and BMI. BMI indicates body mass index; BRFSS, Behavioral Risk Factor Surveillance System; CHD, coronary heart disease.

†P<0.01.
‖P<0.05.
visited the doctor within the past year than those classified as adequately insured (Table 3). When the sample was stratified by age, those aged 18 to 64 years who were uninsured were 60% less likely to use antihypertensive medications and 74% less likely to visit the doctor within the past year, and those who were underinsured were 14% and 20% less likely to report antihypertensive medication use and visit doctor in the past year than those who were adequately insured (Table 3). Among those aged ≥65 years, compared to adequately insured, uninsured adults were 51% less likely to report antihypertensive medication use and 56% less likely to have visited the doctor within the past year. Underinsured adults were 21% less likely to use antihypertensive medication and 23% less likely to have visited the doctor within the past year (Table 3).

Discussion

Among US adults with hypertension, 12% had no health insurance coverage and an additional 26% were underinsured. These individuals require long-term chronic disease management, and adequate health care access is a necessity. Our findings suggest that even among those who had health insurance, barriers to receiving and complying with recommended health care advice was a challenge. For example, underinsured adults with hypertension were less likely to report using antihypertensive medication and visiting the doctor in the past year compared to those who were adequately insured.

Having no health insurance has been routinely linked to poor health outcomes.16–18 The 2013 National Healthcare Quality Report19 and 2014 National Healthcare Disparities Report20 from the Agency for Healthcare Research and Quality found that having health insurance was a key factor in obtaining adequate health care. In an earlier report on US adults with hypertension, nearly 20% reported barriers to health care, and having no health insurance was the most important barrier identified.8 However, the impact of underinsurance on hypertension care has received less attention.

The 2013 BRFSS Health Care Access module provided the opportunity to identify those who are underinsured—participants with financial barriers to needed health care. In our study, these participants included those who stated that they had been diagnosed with hypertension, with any type of health insurance, but who also reported financial barriers to getting health care, including those who were (1) unable to see a doctor in the past year because of cost, (2) unable to take prescription medication in the past year because of cost, (3) without health insurance at some point during the past year, or (4) still paying off medical bills. Although having out-of-pocket expenditures greater than 10% of household income (or ≥5% of household income when income is below 200% of the federal poverty level) is an important criterion to define underinsurance,21 the BRFSS optional module did not include a question about out-of-pocket health care expenses. Therefore, the definition of underinsurance in this study was based on financial burden and gaps in coverage.12 Previous studies have shown that individuals with a recent gap in insurance coverage were more likely to forgo needed health care provider visits or to be unable to refill needed prescribed medications compared to those with continuous coverage.13

The distribution of participants classified as underinsured in this report was similar to that of other surveys. For example, the proportion of those classified as underinsured was higher among younger adults, racial/ethnic minorities, and those with lower levels of education and lower household income.22 The finding that a significantly higher proportion of participants aged 65 years or older had adequate insurance suggests that factors other than income (such as Medicare) were also related to insurance status, given that the census report showed that 2013 median income was lower among those aged ≥65 years ($37,907) than those aged 18 to 64 years ($61,252).23

The fact that one quarter of participants with hypertension were classified as underinsured has important implications for hypertension management. Findings in this report indicate that antihypertensive medication use and regular interactions with the health care system for routine checkups were lower among underinsured participants than those with adequate insurance. Using antihypertensive medication and regular health care provider visits are both critical to successful hypertension control and prevention of heart disease and stroke. This finding was consistent with those of earlier studies that concluded that people who are underinsured are more likely to skip needed care with the concern of their ability to pay for the care received21,22 and were less likely to receive the recommended needed care than those with adequate insurance.24,25 Together, these findings show that the health care system should seek to reduce the barriers for these patients to achieve BP control.

Whereas BP control (<140/90 mm Hg) would be the ideal measure for assessment of hypertension management, BRFSS does not collect direct BP measurements. Therefore, we were unable to assess BP control among BRFSS participants who reported diagnosed hypertension. Instead, we used antihypertensive medication use and visiting a doctor for a routine checkup in the past year as proxy assessment for hypertension management. Previous research has found that antihypertensive medication use2,26 and regular doctor visits27 were related to better BP control.

This report has several limitations. First, all information collected from the BRFSS is self-reported and subject to recall biases. An earlier study reported that around 20% of adults with hypertension are unaware of the condition,28 leading to under-reporting of barriers to care in this population. In
addition, adults with health insurance are more likely to be aware of their hypertension than those without insurance. 29 Second, the BRFSS does not provide information on BP measurement, and we cannot assess the proportion of BP control, an important indicator of hypertension management. Third, the survey provided no information about the out-of-pocket health care expenditures, so we were unable to assess the health care expenditure as a proportion of household income, which is considered a standard assessment of underinsurance.30,31 In fact, it is possible that some participants aged ≥65 years who were categorized as adequately insured would be categorized as underinsured if we defined underinsurance using the criterion of ≥5% of total income spent on out-of-pocket health care expenditures. Finally, given that only 38 states and DC used the Health Care Access Module, the data may not be nationally representative. Nevertheless, the BRFSS, with its large sample survey of self-reported demographic and health-related information, provides the unique opportunity to report insurance status and relevant health care service among people with hypertension.

Perspectives

Among adults with self-reported hypertension, health insurance status was associated with health care received, but having health insurance was not a guarantee of receiving care. Adults with health insurance, but who also reported financial difficulty in obtaining medical care, were associated with less care for hypertension compared to those with adequate health insurance. This is likely to impact participants’ ability to control their hypertension. In fact, some adults classified as adequately insured may be functionally underinsured. For example, some older adults with lower income and high out-of-pocket health care expenditures may be misclassified in this context and have significant barriers to healthcare. Clinical and public health practitioners, as well as policy makers, should be aware of the heterogeneous nature of insurance coverage when developing interventions and activities to improve hypertension control. System-level and community-linked interventions, such as those recommended by the Community Preventive Services Task Force (www.thecommunityguide.org/topic/cardiovascular-disease), should be promoted. Sustainable interventions and examples from the task force to improve hypertension control relevant for this context include reducing out-of-pocket costs and integrating team-based care into the clinical environment.32

Acknowledgments

We thank the BRFSS coordinators from states and members of the Survey Operation Team in the CDC for their help in collecting the data. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the CDC.

Disclosures

None.

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