

Cost-Related Antihypertensive Medication Nonadherence: Action in the Time of COVID-19 and Beyond

Gabriel S. Tajeu¹ and Paul Muntner²

IMPORTANCE OF ADHERENCE TO ANTIHYPERTENSIVE MEDICATION

Clinical trials and observational studies have shown that antihypertensive medication is safe and effective at lowering blood pressure (BP).¹ The BP lowering effect of antihypertensive medication reduces the risk for cardiovascular disease (CVD) events and all-cause mortality.² Despite the benefits of antihypertensive medication, over 50% of US adults taking antihypertensive medication have uncontrolled BP.³ One explanation for the low prevalence of BP control among adults taking antihypertensive medication is nonadherence.^{4,5} A number of potential reasons for antihypertensive medication nonadherence have been described in prior studies.^{6,7} One frequently cited reason for nonadherence is an inability to pay for antihypertensive medication (i.e., cost-related medication nonadherence).^{6,7}

MAIN FINDINGS

In this issue of the *American Journal of Hypertension*, Dr Jing Fang and colleagues add to the existing literature on cost-related medication nonadherence (CRMN) with their study, “Association between cost-related medication nonadherence and hypertension management among US adults.”⁷ In their study, they examined the percentage of US adults who experienced CRMN using data from the 2017 National Health Interview Survey (NHIS). The authors also investigated the association of CRMN with current antihypertensive medication use and self-reporting having normal BP. The NHIS is a nationally representative study of noninstitutionalized US adults conducted annually by the National Center for Health Statistics and the 2017 NHIS included 78,132 participants. The study by Fang included 26,706 participants ≥ 18 years of age, with self-reported hypertension. The independent variable for this study was whether or not participants had CRMN barriers. Participants were categorized as having CRMN barriers if they provided an affirmative answer to any of the following questions: “During the past 12 months, were any

of the following true for you? 1) You skipped medicine doses to save money; 2) You took less medicine to save money; and 3) You delayed filling a prescription to save money.” Current antihypertensive medication use and self-reported normal BP were the dependent variables for the study. Participants were categorized as taking antihypertensive medication if they provided an affirmative response to both of the following questions: “Was any medicine ever prescribed by a doctor for your high blood pressure?” and “Are you now taking any medicine prescribed by a doctor for your high blood pressure?” Normal BP was assessed with the following questions: “About how long has it been since you had your blood pressure checked by a doctor, nurse, or other health professional?” and “At that time, were you told that your blood pressure was high, normal, or low?” If they reported BP had been checked within 12 months and were told their BP was “normal” or “low” they were categorized as having normal BP.

Overall, 10.7% of US adults reported CRMN.⁷ Several subgroups that were vulnerable to CRMN were identified. The prevalence of CRMN was higher for women compared with men (12.2% vs. 8.9%), adults without compared with those with health insurance (41.6% vs. 9.3%), and adults 18–64 vs. ≥ 65 years of age (15.9% vs. 5.3%). There also was an inverse association between family income to poverty ratio and CRMN. The proportion of US adults with CRMN was higher among US adults with more CVD risk factors.

In multivariable adjusted logistic regression, compared with those with CRMN, those without CRMN were more likely to report current antihypertensive medication use (odds ratio = 1.08, 95% confidence interval: 1.04–1.12) and having normal BP (odds ratio = 1.15, 95% confidence interval: 1.07–1.23).⁷ When stratified by age (18–64 and ≥ 65 years) and sex, participants without CRMN were more likely to report current antihypertensive medication use and self-reported normal BP compared with those without CRMN within each subgrouping. These associations were found after adjustment for traditional factors associated with BP control including race/ethnicity, level of education,

Correspondence: Gabriel S. Tajeu (gabriel.tajeu@temple.edu).

Initially submitted May 18, 2020; accepted for publication May 21, 2020; online publication May 25, 2020.

¹Department of Health Services Administration and Policy, Temple University, Philadelphia, Pennsylvania, USA; ²Department of Epidemiology, University of Alabama at Birmingham, Birmingham, Alabama, USA.

doi:10.1093/ajh/hpaa085

© American Journal of Hypertension, Ltd 2020. All rights reserved. For Permissions, please email: journals.permissions@oup.com

health insurance status, income, and number of comorbid CVD risk factors. This suggests that the inability to obtain antihypertensive medication because of cost barriers may be directly related to hypertension control, rather than other factors associated with low socioeconomic status. This is an important finding, because a previous literature review on CRMN reports that most patients who report CRMN try to make their prescription last longer (i.e., reduce the dose or skip days) rather than discontinuing the prescription entirely, which would save the most money in the short term.⁶ Therefore, rather than patients with CRMN skipping medications due to forgetfulness or intentional discontinuation reasons,^{4,8} this may suggest that people with CRMN want to take their medication and believe it is necessary, but they just cannot afford it.

COVID-19 AND HEALTH INSURANCE LOSS

The results presented by Fang *et al.* highlight the importance of addressing CRMN in the United States. The study is even more timely given the COVID-19 pandemic. The COVID-19 pandemic continues to spread in the United States with 1.5 million cases and 90,193 deaths as of 18 May 2020.⁹ The disastrous current and future health effects of the pandemic cannot be overstated. Additionally, the US population is also facing an economic crisis that could exacerbate the current CRMN issues presented by Fang *et al.* The number of unemployed adults in the United States could exceed 40 million by the end of June.¹⁰ Employer sponsored health insurance is the largest source of health insurance in the United States, providing almost half of all health insurance.¹¹ The projected job losses as a result of the COVID-19 pandemic could be accompanied by 7.3 million workers losing health insurance.¹⁰ Family members of these workers could also lose their health insurance as a result leaving millions more US adults without health insurance coverage. This is very troubling considering Fang *et al.* report that 41.6% of US adults without health insurance had CRMN. The combination of losing health insurance and having limited financial resources as a result of unemployment has the potential to drastically increase the proportion of adults in the United States with CRMN. Without universal healthcare coverage in the United States, many people who lose their employer sponsored health insurance will remain without coverage until they are able to secure employment that provides health insurance.

RECOMMENDATIONS

Adherence to antihypertensive medication is of critical importance to preventing negative effects of uncontrolled BP including CVD events, kidney disease progression and cognitive impairment.^{4,5} Fang *et al.* recommend several provider-focused strategies for improving CRMN. Increasing the use of 90-day prescriptions and mail-order service may lower barriers to maintaining supplies of medications.^{12,13} While the large majority of all dispensed antihypertensive medications in the United States are generic,¹⁴ in cases where they are not, prescribing generic medications could

lower cost.¹⁵ They also suggest the prescription of lower cost antihypertensive medication that are therapeutically equivalent to higher cost drugs. However, the risk of CRMN should be balanced against the potential for side effects of less expensive antihypertensive medication, as less expensive classes may have more side effects than more expensive classes (i.e., angiotensin-converting enzyme inhibitors and angiotensin receptor blockers).¹⁶ Perhaps the most effective strategy to decrease CRMN and nonadherence in general would be a reduction or elimination of copayment.^{17,18} For instance, in a review article of 9 studies that examined the effects of reducing out-of-pocket costs on medication adherence, the proportion of individuals who were adherent to antihypertensive and cholesterol medications over 80% of the time increased by 5.1% percentage points when out-of-pocket costs were reduced.¹⁸

While the authors list the use of self-report to determine CRMN as a limitation, the association between CRMN self-report with nonadherence and not having normal BP, respectively, is a strength. Since the self-report was associated with the dependent variables in this study, clinicians who ask their patients about their CRMN can trust their self-report. Therefore, we encourage providers to assess CRMN. Clinicians should engage their patients, reiterate the importance of antihypertensive medication in preventing CVD events and mortality, and encourage their patients to remain adherent. In addition, for patients at risk for losing their health insurance due to job instability associated with COVID-19, clinicians should consider allowing patients to fill 90-day prescriptions and also home BP monitors before they lose health insurance coverage.

During the COVID-19 pandemic, we should also consider more progressive measures to address CRMN. Policymakers should consider reinitiating open enrollment for Affordable Care Act insurance plans so that workers who have lost their jobs can purchase affordable insurance plans. Also, since Medicare Part D is associated with lower rates of CRMN,¹⁹ policymakers should consider extending Part D benefits to all Medicare beneficiaries, closing the Part D Coverage Gap (i.e., donut hole), and suspending Part D premiums during the pandemic. Finally, an even bolder policy initiative would be to expand Medicare coverage to include unemployed workers of all ages affected by the COVID-19 pandemic. Our hope is that the important findings presented by Fang *et al.* on the extent of CRMN in the United States will not be ignored and that policymakers will take action in the time of COVID-19 and beyond.

FUNDING

This work was supported by National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK, 3R01 DK108628 05S1).

DISCLOSURE

The authors declared no conflict of interest.

REFERENCES

1. Benjamin EJ, Blaha MJ, Chiuve SE, Cushman M, Das SR, Deo R, de Ferranti SD, Floyd J, Fornage M, Gillespie C, Isasi CR, Jiménez MC, Jordan LC, Judd SE, Lackland D, Lichtman JH, Lisabeth L, Liu S, Longenecker CT, Mackey RH, Matsushita K, Mozaffarian D, Mussolino ME, Nasir K, Neumar RW, Palaniappan L, Pandey DK, Thiagarajan RR, Reeves MJ, Ritchey M, Rodriguez CJ, Roth GA, Rosamond WD, Sasson C, Towfighi A, Tsao CW, Turner MB, Virani SS, Voeks JH, Willey JZ, Wilkins JT, Wu JH, Alger HM, Wong SS, Muntner P; American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2017 update: a report from the American Heart Association. *Circulation* 2017; 135:e146–e603.
2. Bundy JD, Li C, Stuchlik P, Bu X, Kelly TN, Mills KT, He H, Chen J, Whelton PK, He J. Systolic blood pressure reduction and risk of cardiovascular disease and mortality: a systematic review and network meta-analysis. *JAMA Cardiol* 2017; 2:775–781.
3. Muntner P, Carey RM, Gidding S, Jones DW, Taler SJ, Wright JT Jr, Whelton PK. Potential US population impact of the 2017 ACC/AHA high blood pressure guideline. *Circulation* 2018; 137:109–118.
4. Ho PM, Bryson CL, Rumsfeld JS. Medication adherence: its importance in cardiovascular outcomes. *Circulation* 2009; 119:3028–3035.
5. Burnier M. Medication adherence and persistence as the cornerstone of effective antihypertensive therapy. *Am J Hypertens* 2006; 19:1190–1196.
6. Briesacher BA, Gurwitz JH, Soumerai SB. Patients at-risk for cost-related medication nonadherence: a review of the literature. *J Gen Intern Med* 2007; 22:864–871.
7. Fang J, Chang T, Wang G, Loustalot F. Association between cost-related medication nonadherence and hypertension management among US adults. *Am J Hypertens* 2020; 33:879–886.
8. Lowry KP, Dudley TK, Oddone EZ, Bosworth HB. Intentional and unintentional nonadherence to antihypertensive medication. *Ann Pharmacother* 2005; 39:1198–1203.
9. Center for Systems Science and Engineering. *COVID-19 Dashboard*. Johns Hopkins University; Baltimore, MD, 2020. <https://coronavirus.jhu.edu/map.html>. Accessed 18 May 2020.
10. Woolhandler S, Himmelstein DU. Intersecting U.S. epidemics: COVID-19 and lack of health insurance. *Ann Intern Med* 2020; e-pub ahead of print 7 April 2020.
11. Kaiser Family Foundation. *Health Insurance Coverage of the Total Population*. State Health Facts. Kaiser Family Foundation; San Francisco, CA, 2020. <https://www.kff.org/other/state-indicator/total-population/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>. Accessed 18 May 2020.
12. Liberman JN, Girdish C. Recent trends in the dispensing of 90-day-supply prescriptions at retail pharmacies: implications for improved convenience and access. *Am Health Drug Benefits* 2011; 4:95–100.
13. Taitel M, Fensterheim L, Kirkham H, Sekula R, Duncan I. Medication days' supply, adherence, wastage, and cost among chronic patients in Medicaid. *Medicare Medicaid Res Rev* 2012; 2:mmrr.002.03.a04.
14. Ritchey M, Chang A, Powers C, Loustalot F, Schieb L, Ketcham M, Durthaler J, Hong Y. Vital signs: disparities in antihypertensive medication nonadherence among Medicare part D beneficiaries—United States, 2014. *MMWR Morb Mortal Wkly Rep* 2016; 65:967–976.
15. Choudhry NK, Denberg TD, Qaseem A; Clinical Guidelines Committee of American College of Physicians. Improving adherence to therapy and clinical outcomes while containing costs: opportunities from the greater use of generic medications: best practice advice from the Clinical Guidelines Committee of the American College of Physicians. *Ann Intern Med* 2016; 164:41–49.
16. Bian B, Kelton CM, Guo JJ, Wigle PR. ACE inhibitor and ARB utilization and expenditures in the Medicaid fee-for-service program from 1991 to 2008. *J Manag Care Pharm* 2010; 16:671–679.
17. Maciejewski ML, Farley JF, Parker J, Wansink D. Copayment reductions generate greater medication adherence in targeted patients. *Health Aff* 2010; 29:2002–2008.
18. Njie GJ, Finnie RK, Acharya SD, Jacob V, Proia KK, Hopkins DP, Pronk NP, Goetzel RZ, Kottke TE, Rask KJ, Lackland DT, Braun LT; Community Preventive Services Task Force. Reducing medication costs to prevent cardiovascular disease: a community guide systematic review. *Prev Chronic Dis* 2015; 12:E208.
19. Levine DA, Morgenstern LB, Langa KM, Piette JD, Rogers MA, Karve SJ. Recent trends in cost-related medication nonadherence among stroke survivors in the United States. *Ann Neurol* 2013; 73:180–188.