HHS Public Access

Author manuscript

J Hypertens. Author manuscript; available in PMC 2016 June 01.

Published in final edited form as:

J Hypertens. 2016 June ; 34(6): 1224–1231. doi:10.1097/HJH.0000000000000911.

Antihypertensive medications and sexual function in women: Baseline data from the Systolic Blood Pressure Intervention Trial (SPRINT)

Holly N. Thomas, MD, MS[a], **Gregory W. Evans, MA**[b], **Dan R. Berlowtiz, MD, MPH**[c], **Glenn M. Chertow, MD, MPH**[d], **Molly B. Conroy, MD, MPH**[a], **Capri G. Foy, PhD**[b], **Stephen P. Glasser, MD**[e], **Cora E. Lewis, MD, MSPH**[e], **William T. Riley, PhD**[f], **Laurie Russell, MS**[b], **Olubunmi Williams, MD, MPH**[g], and **Rachel Hess, MD, MS**[h] **for the SPRINT Study Group**

[a]University of Pittsburgh

[b]Wake Forest School of Medicine

[c]Bedford VA Hospital

[d]Stanford University

[e]University of Alabama at Birmingham

[f]National Institute of Mental Health

[g]Emory University

[h]University of Utah

Abstract

Objectives—Hypertension is a risk factor for the development of cardiovascular and kidney disease, but treatment can substantially reduce risks. Many patients avoid antihypertensive medications due to fear of side effects. While associations between antihypertensives and sexual dysfunction in men have been documented, it remains unclear whether antihypertensives are associated with sexual dysfunction in women. We conducted a cross-sectional analysis of baseline data from women in the Systolic Blood Pressure Intervention Trial (SPRINT) to evaluate the relations among class of antihypertensive medication and the outcomes (a) sexual activity and (b) sexual function.

Methods—SPRINT enrolled individuals 50 and older with hypertension at high risk for cardiovascular disease. A subset of participants completed questionnaires regarding quality of life (QoL), including sexual function. Antihypertensive class was determined by medications taken at baseline.

Results—Of 690 women in the QoL subset of SPRINT, 183 (26.5%) were sexually active. There were no significant differences in sexual activity among women taking one or more antihypertensives and women not taking any. Women taking an angiotensin-converting enzyme inhibitor or angiotensin receptor blocker (ACEI/ARB) had higher odds of sexual activity [OR 1.66

Corresponding author and requests for reprints: Holly N. Thomas, MD MS, Assistant Professor of Medicine, University of Pittsburgh, 230 McKee Place Suite 600, Pittsburgh, PA 15213, Phone: 412-692-9836, Fax: 412-692-4838, thomashn@upmc.edu.

(1.12-4.27), p=0.011]. Among sexually active women, the prevalence of sexual dysfunction was high (52.5%). No class of medication was associated with sexual dysfunction in the multivariable model.

Conclusions—ACEI/ARB use was associated with higher odds of sexual activity. While prevalence of sexual dysfunction was high, no single class of antihypertensive medication was associated with sexual dysfunction.

Keywords

hypertension; antihypertensive agents; female sexual function; sexual activity

Introduction

Hypertension an important risk factor for the development of cardiovascular disease (1), the leading cause of death in the United States (2). Additionally, hypertension is associated with stroke (3) and kidney failure (4, 5). Adequate treatment of hypertension can result in substantial reductions in morbidity and mortality; however, many patients avoid antihypertensive medications due to the fear of side effects. Seventy percent of patients with hypertension who experience side effects are non-adherent with medications (6) and individuals whose antihypertensive agents have an adverse effect on quality of life (QoL) have 40-60% higher rates of discontinuation than those who are not affected (7).

One important aspect of QoL that may be affected by antihypertensive medications is sexual function. While several studies have documented associations among certain antihypertensive medications—particularly beta-blockers (8, 9) and diuretics (10-14)—with sexual dysfunction in men, it is unclear whether antihypertensive medications are associated with sexual dysfunction in women. The issue is complicated by the fact that hypertension itself is associated with female sexual dysfunction (15-18), and hypertension often develops in tandem with other factors that may influence female sexual function such as aging, menopause, and medical comorbidities. Additionally, female sexual function is a complex phenomenon, influenced by numerous biologic and psychosocial factors.

There are biologically plausible pathways by which antihypertensive medications may affect female sexual function. Many antihypertensive agents act by relaxing the smooth muscle of the tunica media resulting in vasodilation; the increased blood flow to vaginal tissues during arousal is also due to relaxation of smooth muscle (19). Animal models have shown that nitric oxide is involved in female sexual arousal (19); several antihypertensive medications – beta blockers (20) (21), angiotensin-converting enzyme inhibitors (ACEIs) (22, 23), angiotensin receptor blockers (ARBs) (22, 24), and calcium channel blockers (CCBs) (25) – affect the nitric oxide pathway, and may therefore actually improve female sexual function. In contrast, beta-blockers have been found to decrease serum testosterone levels (26-28) in men; their effects on serum testosterone in women are unknown. Serum testosterone has been associated with female sexual dysfunction in some studies (29-34), although this remains an area of controversy (35). If beta-blockers also lower testosterone in women, they may have negative effects on female sexual function.

Our aim was to conduct a cross sectional evaluation of the associations among different classes of antihypertensive medications and (a) sexual activity and (b) sexual function among female participants in Systolic Blood Pressure Intervention Trial (SPRINT). We hypothesized *a priori* that beta adrenergic blockers would be correlated with poorer sexual function in women, given their potential effects on sexual function in men and based on prior studies (7, 9), while other classes of antihypertensive medications would not.

Methods

Participants

SPRINT is a multicenter randomized controlled trial to test the effects of different blood pressure control targets (<140 mm Hg versus <120 mm Hg) on a variety of outcomes, including cardiovascular events, kidney function, and cognitive function. SPRINT recruited participants aged 50 years and older (including persons with cardiovascular disease, chronic kidney disease (CKD), age ≥75 years, or a 10-year Framingham cardiovascular risk of ≥15%). Persons with >1 g/day proteinuria, diabetes mellitus, polycystic kidney disease, or a history of stroke were excluded. Full details on the design of SPRINT, including definitions for inclusion and exclusion criteria, have been previously published (36, 37). Baseline data were collected in 2010-2013. A random sample of participants (1987/9361, 21.2%) completed questionnaires regarding QoL. Women in the QoL subset are basis for this analysis. All participants provided signed informed consent. The study was approved by the Institutional Review Board at each study site and was registered with clinicaltrials.gov (NCT01206062).

Primary measures

Sexual activity included any activity with or without a partner in the prior 4 weeks. Sexual function was assessed using the Female Sexual Function Index (FSFI)(38), a highly validated19-item questionnaire that assesses sexual function over six domains: desire, arousal, lubrication, orgasm, pain, and satisfaction. Higher scores indicate better sexual function, and a score of <27 has been established as a cutoff for sexual dysfunction (39).

Antihypertensive class was defined by the medications participants were taking at the baseline visit prior to randomization. Some participants were taking multiple and some were taking no antihypertensive medications. In addition to counting the number of medications used by each participant, we created indicator variables to capture use of any antihypertensive medication, use of ACEI or ARB, use of diuretics, use of beta-blockers, use of CCBs, and the use of any other antihypertensive agents (alpha blockers, alpha-beta blockers, direct vasodilators, direct renin inhibitors, or central alpha-2 agonists and other centrally acting drugs). Each medication class was considered as a dichotomous variable. Classifications were not mutually exclusive for women who were on more than one antihypertensive medication.

Covariates

All covariates were selected *a priori* based on factors related to sexual function in prior literature. Covariates included blood pressure, demographic variables (age, race and

ethnicity, education level, living situation), other medications which may affect sexual function [selective serotonin reuptake inhibitors (SSRIs) or hormone therapy (HT)], and the presence of certain co-morbidities (chronic kidney disease, hyperlipidemia, and cardiovascular disease).

Blood pressure measurements were the average of 3 measurements taken at one-minute intervals after the participant had been sitting quietly in a room for 5 minutes. SPRINT did not assess whether participants were in a romantic relationship, but participants did indicate whether they lived with others or alone. Use of SSRIs or HT was assessed by self-report. Presence of CKD was defined as an estimated GFR of 20-59 ml/min/1.73m^2. Hyperlipidemia was defined by serum total cholesterol >200 mg/dL. Cardiovascular disease was defined by previous clinical or subclinical cardiovascular disease other than stroke (individuals with stroke were excluded from SPRINT).

Analysis

Categorical variables are reported as N(%) and continuous variables as mean (SD). Total and domain specific FSFI scores were calculated only for sexually active women, with missing responses replaced with mean imputation (40).

Sexual activity—Among women in the QoL sample, we constructed separate univariable logistic regression models to examine the relation between (a) any versus no antihypertensive medication use and sexual activity; and (b) class of antihypertensive medication; and the outcome, sexual activity. Multivariable models were constructed to examine the relations among the same independent variables and the outcome while adjusting for above covariates. We report odds ratios (OR) and 95% confidence intervals (95% CI).

Sexual function—Among sexually active women in the QoL sample, we fit separate univariable linear regression models to examine the correlation between (a) any antihypertensive medication at baseline versus no antihypertensive medication; and (b) class of antihypertensive medication; and the outcome, total FSFI score. Multivariable models were constructed to examine the relations among the same independent variables and the outcome while adjusting for above covariates. Results are reported as beta coefficients and 95% confidence intervals.

Standard regression diagnostics were used to evaluate assumptions for both logistic and linear models, and no important violations were found. As sensitivity analyses, we also fit multivariable logistic and multivariable linear models where the dichotomous variable for any antihypertensive medication use was replaced by the number of medication classes used (0 to 4). We considered 2-tailed p-values <0.05 statistically significant. In these analyses, we did not adjust for multiple comparisons. All analyses were conducted with SAS 9.4 (Cary, NC, USA).

Results

Of the 3332 randomized women in SPRINT, 1102 (33%) were on a beta-blocker, 1173 (35%) were on a calcium channel blocker, 1723 (52%) were on a diuretic, 1902 (57%) were on a RAS blocker, and 255 (8%) were on another antihypertensive medication. There were 690 women in the QoL subset of SPRINT. Of these, 183 (26.5%) were sexually active, 452 (65.5%) were not, and 55 (8.0%) had missing data regarding sexual function (Figure). All women in the QoL subset were included in the analysis of sexual activity. Only sexually active women were included in the analysis of sexual function. Demographic characteristics are summarized in Table 1. In the QoL subset, mean age was 67.6 (SD 10) years and 43.6% were white. The median number of medications used by sexually active women was 2. Sixty-one percent of sexually active women in the QoL subset were taking more than one category of antihypertensive medication. The most common combinations were a diuretic with an ACEI or ARB (18.6%), a beta-blocker with a diuretic and an ACEI or ARB (7.1%), and a calcium channel blocker with a diuretic and an ACEI or ARB (7.1%).

Sexual activity

Results of multivariable models with sexual activity as the dependent variable are presented in Table 2. For the model incorporating use of *any antihypertensive medication* (Model 1), younger women ($p<0.001$), more highly educated women ($p=0.002$), and those living with others ($p=0.018$) had higher odds of being sexually active. Odds of sexual activity differed among race/ethnic groups ($p=0.003$), with white, black, and Hispanic women having lower odds than women of other races (including multi-racial women); however, there were only 10 women in this group, so these results should be interpreted with caution. Similar results were observed for the model incorporating use of specific antihypertensive medication classes. Prevalence of sexual activity did not differ for women on any antihypertensive medication(s) versus women on no antihypertensive medication ($p=0.81$, Model 1).

However, in the model examining *specific antihypertensive classes* (Model 2), women taking an ACEI or ARB had increased odds of sexual activity compared to women not taking these medications [OR 1.66 (1.12, 2.47), $p=0.011$]. No other class of antihypertensive medication was significantly associated with sexual activity. In sensitivity analyses, number of antihypertensive classes used was not significantly related to sexual activity ($p=0.99$).

Sexual function

Among sexually active women, the mean FSFI score was 25.3 (SD 6) (Table 3). Ninety-six (52.5%) sexually active women were below the cutoff for sexual dysfunction. FSFI domain scores were similar for women taking different classes of antihypertensive medications. In univariable analyses, no class of medication was significantly associated with FSFI score (results not shown). Using the sample standard deviation (6.0), these analyses had 82% (85%, 92%, and 90%) power to detect a difference of 3 units in FSFI scores between beta-blocker (CCB, diuretic, and ACEI/ARB respectively) users and non-users.

In multivariable analyses, there is a trend towards better sexual function among women on no antihypertensive agents that did not reach statistical significance [beta 2.73 (-0.22, 5.68),

p=0.069], (Model 1, Table 4). There were no significant associations found between any class of antihypertensive medication and sexual function (Model 2, Table 4). After controlling for specific classes of antihypertensive medications, HT use was associated with poorer sexual function scores [beta -3.42 (-6.74, -0.10), p=0.044]. In sensitivity analyses, the number of antihypertensive medications used was not significantly related to sexual function (p=0.85).

Discussion

In this cross-sectional analysis of sexually active women 50 years and older at high risk for cardiovascular disease, we found that approximately one quarter of women were sexually active, and of these, over half were classified as having sexual dysfunction. Women taking ACEI/ARBs were more likely to be sexually active compared to women not on these medications. No single class of antihypertensive medication was correlated with sexual function.

Other authors have found similar prevalence of sexual activity among older women with medical problems (41). In caring for these women, providers should be aware that some are still sexually active. It could be hypothesized that some of these women *became* sexually inactive due to sexual dysfunction; however, one prior study found that older women with poor sexual function are just as likely to remain sexually active as those with better sexual function (42).

The prevalence of sexual dysfunction was high in this sample; other studies using the FSFI in older women have also found similar results (42-44). There are associations among medical comorbidities such as cardiovascular disease (45), chronic kidney disease (46, 47), and hypertension (48) with sexual dysfunction. The combination of older age and medical comorbidities may explain the high prevalence of sexual dysfunction in our sample.

Women in SPRINT who were taking an ACEI or ARB at baseline were more likely to be sexually active than women not taking these medications, even when adjusting for other factors that may affect sexual function. The mechanism through which ACEI/ARBs may affect sexual function is not clear. In animal models, inhibition of NO synthase has been shown to reduce smooth muscle relaxation in clitoral tissue (49), and phosphodiesterase-5 inhibitors, which promote NO accumulation, have been shown to enhance stimulation-induced clitoral blood flow (50). ACEIs and ARBs decrease the breakdown of bradykinin, which enhances the accumulation of NO in the endothelium (22); increased NO may lead to increased clitoral bloodflow and improved arousal. Another mechanism may be through QoL; ACEIs and ARBs are associated with better QoL scores (7, 51), and higher QoL is associated with being sexually active (52, 53). While we did control for education as a proxy for socioeconomic status, there still may be socioeconomic differences among women who take ACEI/ARBs and women who do not, and socioeconomic status may be related to whether women are sexually active (54). Additionally, younger patients may be more likely to receive ACEI/ARBs, and younger patients are more likely to be sexually active. While we did adjust for age in our analyses, there is the possibility for residual confounding. Finally,

there is the possibility that this association is spurious, and our findings should be confirmed in future studies.

No single class of antihypertensive medication in SPRINT was associated with sexual function. Prior studies of the effects of antihypertensive medications on female sexual function have yielded mixed results. One study found that beta blockers have an adverse effect (9), while three studies did not (11, 55, 56). Two studies found that CCBs are not associated with female sexual function (13, 55), and one study found no association between alpha-blockers, ACEIs, or thiazides and sexual function (55). A more recent study found no associations between CCBs, beta-blockers, ACEI/ARBs, diuretics, or alpha blockers and female sexual dysfunction (57). However, many of these studies are small, and none use a validated measure of sexual function.

Two studies did assess sexual function more comprehensively. In one study, 120 postmenopausal women were randomized to valsartan or atenolol and sexual function was assessed with a 10-item questionnaire (58). These authors found that beta-blockers had adverse effects and ARBs had positive effects on sexual function. In the other study, 160 women aged 18-60 with hypertension were randomized to felodipine + irbesartan or felodipine + metoprolol and sexual function was assessed with the FSFI (59). In women placed on irbesartan, FSFI scores improved, while in women placed on metoprolol, there were no changes in FSFI scores. The mean improvement in FSFI scores for women on irbesartan was by <1 point, so the clinical significance is questionable.

Many women in SPRINT were taking multiple antihypertensive medications, which may make it more difficult to isolate the effects of any one class of medication; however, we did control for other classes of medications in our multivariable analyses. The numbers of women on monotherapy for each class were too small to include them in multivariable analyses. However, the unadjusted mean FSFI total and domain scores appear comparable for women on monotherapy and women on multiple medications (supplemental table).

Our study has several strengths. It used a well-validated, multidimensional assessment of female sexual function. We also controlled for a number of important potential confounders that have not been assessed in prior studies. SPRINT also gave us the opportunity to assess every major class of antihypertensive medication, as opposed to only one or two medications, in the same study. Finally, this study gave us important information about sexual activity and sexual function in an older cohort of women who are often excluded from studies on sexual function.

There are several limitations to this study. First, the sample size is moderate. However, our study had >80% power to detect differences of at least 3 units in FSFI scores for each antihypertensive medication class. While larger studies may be able to detect smaller differences, these differences are not likely to be clinically significant. In addition, there were only 19 women not taking any antihypertensive medications, so results among this group should be interpreted with caution. Second, our data are cross-sectional. Longitudinal studies that evaluate *changes* in sexual function with different antihypertensive agents could yield more clinically useful information. For example, women may have previously

discontinued a particular antihypertensive medication due to sexual side effects. SPRINT is a 6-year study, so we will have the opportunity to follow these women over time.

Some older women with medical comorbidities are sexually active, but prevalence of sexual dysfunction in this group is high. Women taking an ACEI/ARB may be more likely to be sexually active, but cause and effect cannot be determined in these analyses. These results should be confirmed in subsequent longitudinal studies. No single class of antihypertensive medication was associated with sexual dysfunction. These results should be confirmed in longitudinal studies, but based on the power estimates of this study, it appears that antihypertensives are unlikely to affect sexual function.

Acknowledgments

Acknowledgements / Sources of Funding: The Systolic Blood Pressure Intervention Trial is funded with Federal funds from the National Institutes of Health (NIH), including the National Heart, Lung, and Blood Institute (NHLBI), the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), the National Institute on Aging (NIA), and the National Institute of Neurological Disorders and Stroke (NINDS), under Contract Numbers HHSN268200900040C, HHSN268200900046C, HHSN268200900047C, HHSN268200900048C, HHSN268200900049C, and Inter-Agency Agreement Number A-HL-13-002-001. It was also supported in part with resources and use of facilities through the Department of Veterans Affairs. The SPRINT investigators acknowledge the contribution of study medications (azilsartan and azilsartan combined with chlorthalidone) from Takeda Pharmaceuticals Inc. Stephen P. Glasser is partially supported by a grant from AMGEN. No other author has any conflicts of interest to report. All components of the SPRINT study protocol were designed and implemented by the investigators. The investigative team collected, analyzed, and interpreted the data. All aspects of manuscript writing and revision were carried out by the coauthors. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH, the U.S. Department of Veterans Affairs, or the United States Government. For a full list of contributors to SPRINT, please see the supplementary acknowledgement list: ClinicalTrials.gov Identifier: NCT01206062.

We also acknowledge the support from the following CTSAs funded by NCATS: CWRU: UL1TR000439, OSU: UL1RR025755, U Penn: UL1RR024134& UL1TR000003, Boston: UL1RR025771, Stanford: UL1TR000093, Tufts: UL1RR025752, UL1TR000073 & UL1TR001064, University of Illinois: UL1TR000050, University of Pittsburgh: UL1TR000005, UT Southwestern: 9U54TR000017-06, University of Utah: UL1TR000105-05, Vanderbilt University: UL1 TR000445, George Washington University: UL1TR000075, University of CA, Davis: UL1 TR000002, University of Florida: UL1 TR000064, University of Michigan: UL1TR000433, Tulane University: P30GM103337 COBRE Award NIGMS.

This manuscript has not been published and is not being considered for publication elsewhere, in whole or in part, in any language, except as an abstract. We presented an abstract of this data as poster at the Society of General Internal Medicine (SGIM) national conference in San Diego, California in April 2014.

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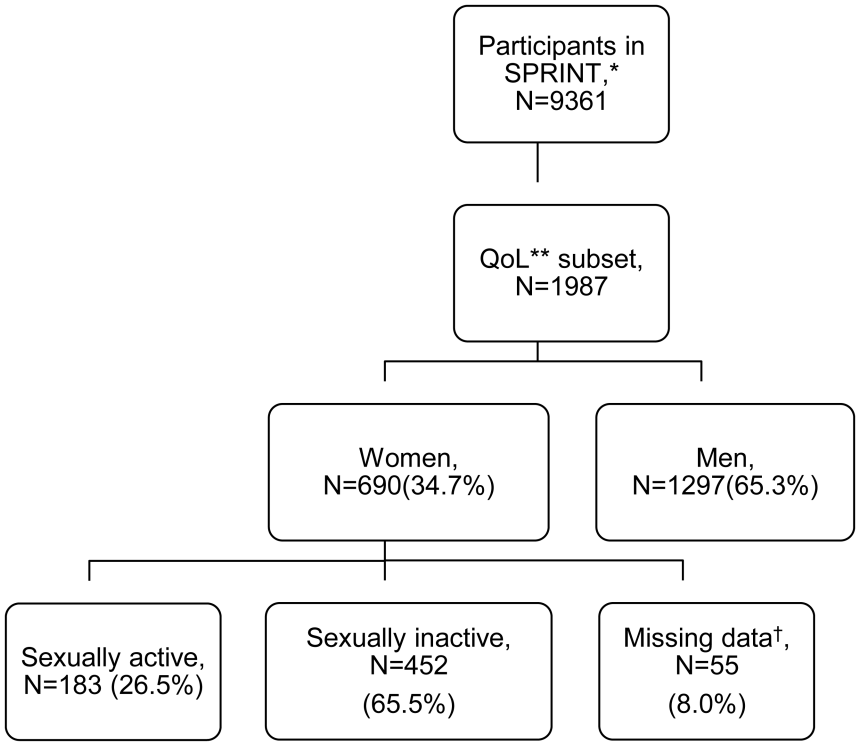

Figure.

*SPRINT=Systolic Blood Pressure Intervention Trial, **QoL=Quality of Life †Includes one woman indicating sexual activity but with missing data on sexual function

Table 1

Baseline characteristics of Women in SPRINT*

Baseline characteristic	All women in SPRINT (N=3333), N(%)	Women in the QoL† subset (N=690), N(%)	Sexually active women in the QoL subset (N=183), N(%)	Sexually active women taking at least one anti-hypertensive (N=164), N(%)	Sexually active women taking no anti-hypertensives (N=19), N(%)
Mean age, years (SD)	68.5 (9.5)	67.6 (10)	63.4 (9.1)	63.9 (9.2)	58.6 (7)
Race					
White	1555 (46.7)	301 (43.6)	76 (41.5)	68 (41.5)	8 (42.1)
African-American	1270 (38.1)	276 (40)	72 (39.3)	63 (38.4)	9 (47.4)
Hispanic	453 (13.6)	103 (14.9)	29 (15.8)	28 (17.1)	1 (5.3)
Other	55 (1.7)	10 (1.4)	6 (3.3)	5 (3)	1 (5.3)
Education status					
Did not attend college	986 (29.6)	216 (31.3)	39 (21.3)	35 (21.3)	4 (21.2)
Attended college	1249 (37.5)	237 (34.3)	63 (34.4)	58 (35.4)	5 (26.3)
College graduate	436 (13.1)	103 (14.9)	34 (18.6)	29 (17.7)	5 (26.3)
Graduate or prof. school	651 (19.5)	132 (19.1)	47 (25.7)	42 (25.6)	5 (26.3)
Lives with others (vs. alone)	2007 (60.4)	444 (64.5)	137 (74.9)	137 (74.9)	15 (78.9)
Mean SBP‡ (mm Hg)	141.2 (16.9)	142.3 (17.2)	140.9 (16.6)	140.6 (16.6)	143.1 (17.5)
Mean DBP§ (mm Hg)	77.6 (12.2)	78.8 (12.3)	81.4 (13.1)	80.8 (12.8)	87.4 (14.5)
SSRI// user (versus no)	321 (9.6)	72 (10.4)	16 (8.7)	16 (9.8)	0 (0)
Hormone therapy user	279 (8.4)	55 (8)	15 (8.2)	15 (9.3)	1 (5.3)
CKD¶	1321 (38.6)	240 (34.8)	42 (23)	40 (24.4)	2 (10.5)
Hyperlipidemia	1895 (56.9)	390 (56.5)	99 (54.1)	91 (55.5)	9 (47.4)
Cardiovascular disease	512 (15.4)	106 (15.4)	23 (12.6)	20 (12.2)	3 (15.8)

*Systolic Blood Pressure Intervention Trial,

†quality of life,

‡systolic blood pressure,

§diastolic blood pressure,

//selective serotonin reuptake inhibitor,

¶chronic kidney disease

Table 2

Multivariable factors associated with sexual activity among women in the quality of life subset of SPRINT*, N=635

	Model 1 – Any antihypertensive(s) versus none		Model 2 – Class of antihypertensive	
Variable	**OR for being sexually active (95% CI)**	**P value**	**OR for being sexually active (95% CI)**	**P value**
Antihypertensive class				
Any antihypertensive use (v. none)	1.09 (0.55,2.15)	0.81	-	-
Beta-blocker use (v. no)	-	-	0.73 (0.47,1.13)	0.159
ACEI/ARB† use (v. no)	-	-	1.66 (1.12,2.47)	0.011
Calcium channel blocker use (v. no)	-	-	0.83 (0.55,1.27)	0.40
Diuretic use (v. no)	-	-	1.06 (0.71,1.56)	0.78
Other antihypertensive use (v. no)	-	-	1.04 (0.52,2.12)	0.90
Age (per 10 years increase)	0.52 (0.4,0.69)	<0.001	0.49 (0.37,0.65)	<0.001
Race/Ethnicity				
White	Ref	0.033	Ref	0.023
African-American	0.72 (0.46,1.14)		0.68 (0.42,1.08)	
Hispanic	0.66 (0.37,1.19)		0.59 (0.33,1.08)	
Other	7.21 (1.33,39.2)		6.88 (1.21,38.93)	
Education				
Did not attend college	Ref	0.002	Ref	0.001
Some college	1.59 (0.97,2.6)		1.69 (1.03,2.8)	
College graduate	2.39 (1.31,4.37)		2.59 (1.4,4.79)	
Graduate or professional school	2.77 (1.59,4.85)		2.98 (1.68,5.29)	
Lives with others (v. no)	1.66 (1.09,2.54)	0.018	1.72 (1.12,2.66)	0.014
SBP‡ (per 10 mm Hg increase)	0.99 (0.85,1.14)	0.86	1.01 (0.87,1.17)	0.90
DBP§ (per 10 mm Hg increase)	1.02 (0.82,1.28)	0.85	0.99 (0.79,1.25)	0.96
Use of SSRI‖	0.82 (0.43,1.55)	0.53	0.81 (0.43,1.55)	0.53
Use of hormone therapy	0.82 (0.41,1.61)	0.56	0.87 (0.44,1.69)	0.67
Medical comorbidities				
CKD¶	0.74 (0.48,1.13)	0.165	0.75 (0.48,1.17)	0.20
Hyperlipidemia	0.89 (0.61,1.3)	0.55	0.94 (0.64,1.39)	0.77
Cardiovascular disease	0.78 (0.45,1.34)	0.37	0.75 (0.42,1.31)	0.31

Each estimate is adjusted for all other variables with estimates shown; in Model 2, results for each class of antihypertensive use are adjusted for use of other classes of antihypertensives.

*Systolic Blood Pressure Intervention Trial,

†angiotensin-converting enzyme inhibitor / angiotensin receptor blocker,

‡systolic blood pressure,

§diastolic blood pressure,

// selective serotonin reuptake inhibitor,

¶ chronic kidney disease

J Hypertens. Author manuscript; available in PMC 2016 June 01.

Table 3

FSFI* scores among sexually active women in SPRINT

	All sexually active women (N=183), mean (SD)	Beta-blocker users (N=45), mean (SD)	Calcium channel blocker users (N=50), mean (SD)	Diuretic users (N=95), mean (SD)	ACEI/ARB† users (N=115), mean (SD)
Prevalence of sexual dysfunction, N (%)	96 (52.5)	22 (48.9)	27 (54.0)	51 (53.4)	66 (57.4)
Total FSFI score (range 2.0-36.0)	25.3 (6)	24.6 (6.7)	25.4 (6.4)	24.8 (6.5)	24.9 (5.7)
Desire (range 1.2-6.0)	3.6 (1.2)	3.4 (1.2)	3.5 (1.3)	3.6 (1.2)	3.6 (1.2)
Arousal (range 0-6.0)	4 (1.2)	3.8 (1.4)	3.9 (1.4)	3.9 (1.3)	3.9 (1.2)
Lubrication (range 0-6.0)	4.5 (1.2)	4.2 (1.4)	4.5 (1.2)	4.5 (1.3)	4.3 (1.2)
Orgasm (range 0-6.0)	4.4 (1.3)	4.4 (1.4)	4.3 (1.5)	4.4 (1.4)	4.3 (1.3)
Satisfaction (range 0.8-6.0)	4.2 (1.3)	4.2 (1.3)	4.3 (1.4)	4.1 (1.3)	4.1 (1.3)
Pain (range 0-6.0)	5.2 (1.1)	5.1 (1.2)	5.1 (1.1)	5.2 (1.0)	5.1 (1.1)

*Female Sexual Function Index,

†Angiotensin converting enzyme inhibitor / angiotensin receptor blocker

Table 4

Multivariable factors associated with sexual function (FSFI* score) among sexually active women in SPRINT

	Model 1 – Any antihypertensive(s) versus no antihypertensives		Model 2 – Class of antihypertensive	
Variable	**Beta for FSFI score (95% CI)**	**P-value**	**Beta for FSFI score (95% CI)**	**P-value**
Antihypertensive class				
No antihypertensive use (v. any)	2.73 (-0.22,5.68)	0.069	-	-
Beta-blocker use (v. no)	-	-	-0.57 (-2.81,1.66)	0.61
Calcium channel blocker use (v. no)	-	-	0.39 (-1.65,2.43)	0.71
Diuretic use (v. no)	-	-	-1.42 (-3.35,0.5)	0.146
ACEI/ARB† use (v. no)	-	-	-1.08 (-2.97,0.8)	0.26
Other Antihypertensive med use (v. no)	-	-	0.37 (-3.19,3.92)	0.84
Age (per 10 years increase)	0.75 (-0.71,2.2)	0.31	0.54 (-0.93,2.01)	0.47
Race/Ethnicity				
White	Ref	0.12	Ref	0.159
African-American	2.37 (0.14,4.59)		2.33 (0.07,4.6)	
Hispanic	2.53 (-0.27,5.32)		2.07 (-0.77,4.92)	
Other	-1.02 (-6.05,4.01)		-1.14 (-6.29,4.01)	
Education				
Did not attend college	Ref	0.14	Ref	0.114
Some college	2.36 (-0.2,4.92)		2.57 (-0.04,5.18)	
College graduate	3.24 (0.31,6.16)		3.4 (0.44,6.36)	
Graduate or professional school	2.43 (-0.34,5.2)		2.58 (-0.21,5.38)	
Lives with others (v. no)	1.27 (-0.86,3.39)	0.24	0.99 (-1.19,3.17)	0.37
SBP‡ (per 10 mm Hg increase)	0.03 (-0.76,0.82)	0.93	0.01 (-0.81,0.82)	0.99
DBP§ (per 10 mm Hg increase)	0.78 (-0.34,1.91)	0.17	0.69 (-0.46,1.84)	0.24
Use of SSRI//	-1.04 (-4.27,2.2)	0.53	-1.31 (-4.65,2.04)	0.44
Use of hormone therapy	-3.14 (-6.4,0.12)	0.059	-3.42 (-6.74,-0.1)	0.044
Medical comorbidities				
CKD¶	0.55 (-1.72,2.83)	0.63	-0.05 (-2.51,2.41)	0.97
Hyperlipidemia	0.96 (-0.85,2.76)	0.30	0.93 (-0.91,2.77)	0.32
Cardiovascular disease	0.14 (-2.58,2.86)	0.92	0.28 (-2.55,3.1)	0.85

Each estimate is adjusted for all other variables with estimates shown; in Model 2, results for each class of antihypertensive use are adjusted for use of other classes of antihypertensives.

*Female Sexual Function Index--higher scores indicate better sexual function,

†Angiotensin converting enzyme inhibitor/angiotensin receptor blocker,

‡systolic blood pressure,

§diastolic blood pressure,

// selective serotonin reuptake inhibitor,

¶ chronic kidney disease