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PTSD and Medications Adherence in Patients with Uncontrolled Hypertension

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TO THE EDITOR

Post-traumatic stress disorder (PTSD) is common in primary care patients[1] and is associated with psychological distress, suicide risk, and disability. PTSD also increases risk of incident and recurrent cardiovascular events,[2] possibly by reducing medication adherence.[3] Prior studies showing an association between PTSD and medication non-adherence[3] are limited by their use of self-report to measure adherence as PTSD can bias reporting of negative behaviors.[4] We evaluated the association between PTSD and antihypertensive medication adherence using electronic monitoring in primary care patients with uncontrolled hypertension.

METHODS

We enrolled a convenience sample of patients with uncontrolled hypertension from an academic hospital-based primary care clinic in New York City. Patients were eligible if they had elevated blood pressure (BP) on two consecutive clinic visits prior to enrollment (BP ≥140/90 mm Hg or ≥130/80 mm Hg if they had diabetes or chronic kidney disease). Patients

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were ineligible if they had dementia, psychosis, active substance abuse, or resided in an institutional setting. All patients provided written informed consent. The institutional review board of Columbia University Medical Center approved the protocol.

We evaluated PTSD using the 4-item Primary Care PTSD screen (PC-PTSD), which asks patients whether, in response to a traumatic event, they had current PTSD symptoms (re-experiencing, numbing, avoidance, and hyperarousal). A cutpoint of 3 on this screen has good sensitivity and specificity (>80%) for diagnosing PTSD as compared to a clinical interview.[5] We assessed medication adherence during the interval between two subsequent clinic visits using an electronic pillbox (MedSignals®). Each BP medication was stored in one of four pillbox compartments. The pillbox records the date and time when each compartment is opened. Regimen adherence was calculated as the mean adherence to monitored medications, with adherence to each medication calculated as the percent of days the prescribed number of doses was taken.

Patients were categorized as non-adherent if regimen adherence was <80%.[6] Logistic regression was used to determine whether PTSD symptoms were associated with non-adherence after adjusting for covariates commonly associated with adherence (age, gender, race, ethnicity, number of blood pressure medications, and depressive symptoms measured by the 8-item Patient Health Questionnaire).

RESULTS

Between 2011 and 2013, we identified 123 patients who met eligibility criteria; 114 (92%) consented and 98 (86%) had usable pillbox data. The mean (SD) age was 64 years (9), 76% were women, 81% Hispanic, and 29% white. Fifty-nine percent had no PTSD symptoms, 20% had 1–2 symptoms, and 19% had 3–4 symptoms, consistent with a positive screen for PTSD.

The mean number of prescribed BP medications was 2.6 (0.9). Adherence was monitored for a mean of 56 (43) days. Median regimen adherence was 86% (interquartile range 58%-97%), and 41% of the sample was non-adherent (<80% of days). In unadjusted analysis, there was a graded association between PTSD symptoms and medication non-adherence (Figure). Sixty-eight percent of patients who screened positive for PTSD were non-adherent compared to 26% without any PTSD symptoms (*P*=0.001). In adjusted analyses, PTSD symptoms continued to be associated with non-adherence; those who screened positive for PTSD had 5.2 (95% CI 1.1–24.4) increased odds of non-adherence compared to those without PTSD symptoms (p=0.04; Table).

CONCLUSIONS

This study is the first to demonstrate that PTSD is an independent risk factor for non-adherence among patients with uncontrolled hypertension, and offers a potential mechanism by which PTSD is associated with cardiovascular disease. Limitations include its modest sample size, recruitment from a single urban practice, and brief assessment period. Given the prevalence of PTSD and its strong association with medication non-adherence, our

findings provide impetus to evaluate the benefit of enhanced screening and treatment for PTSD in medical settings to improve cardiovascular risk in these patients.

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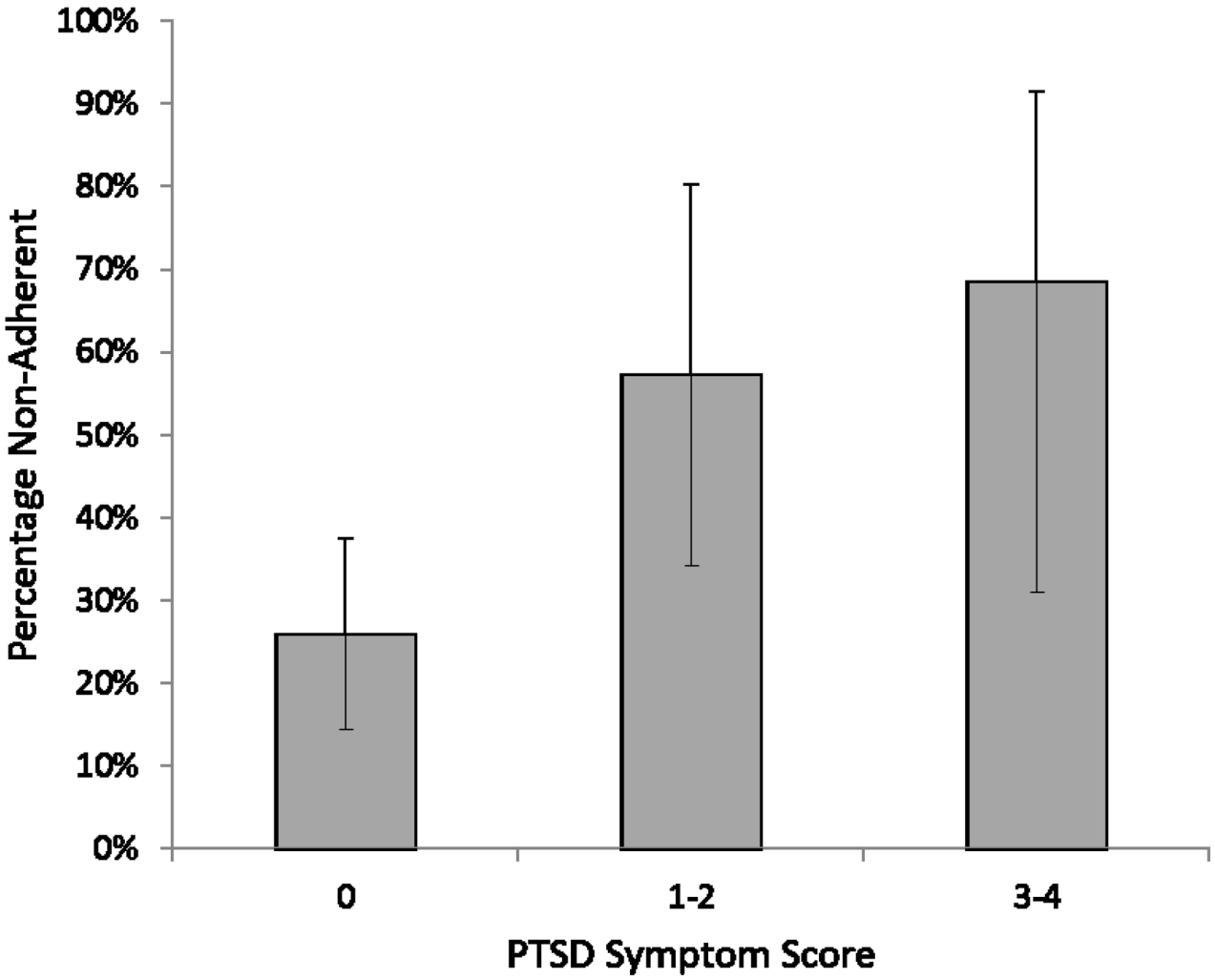

Figure.

Post-traumatic stress disorder (PTSD) symptoms and non-adherence to antihypertensive medications.

Non-adherence was defined as taking less than 80% of the antihypertensive regimen. Error bars represent 95% confidence intervals.

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Table

Unadjusted and Adjusted Association between Post-Traumatic Stress Disorder Symptoms and Non-Adherence to Blood Pressure Medications

Characteristic	Unadjusted Odds Ratio	95% Confidence Interval	P-value	Adjusted Odds Ratio	95% Confidence Interval	P-value
PC-PTSD score						
Reference 0	-	-	-	-	-	-
1–2	3.82	1.34–10.87	0.01	4.22	1.33–13.51	0.02
3–4	6.21	2.00–19.23	0.002	5.18	1.10–24.39	0.04
Age	1.10	0.91 – 1.00	0.05	0.96	0.91–1.01	0.14
Male	0.76	0.30 – 1.93	0.57	0.76	0.26–2.17	0.60
Hispanic	1.39	0.51 – 3.82	0.52	1.62	0.50–5.29	0.43
White	0.74	0.30 – 1.83	0.52	1.10	0.38–3.22	0.86
Number of blood pressure medications	1.60	1.01–2.54	0.05	1.66	0.99–2.78	0.06
Depressive symptoms	1.08	1.01 – 1.16	0.03	1.00	0.90–1.10	0.90

Abbreviations: PC-PTSD, Primary Care Post-Traumatic Stress Disorder screening questionnaire