

Sleep Patterns and Hypertension Using Actigraphy in the Hispanic Community Health Study/Study of Latinos

Alberto R. Ramos, MD, MSPH; Jia Weng, PhD; Douglas M. Wallace, MD; Megan R. Petrov, PhD; William K. Wohlgenuth, PhD; Daniela Sotres-Alvarez, DrPH; Jose S. Loreda, MD; Kathryn J. Reid, PhD; Phyllis C. Zee, MD, PhD; Yasmin Mossavar-Rahmani, PhD; and Sanjay R. Patel, MD

BACKGROUND: The aim of this study was to evaluate the association between actigraphy-based measures of sleep and prevalent hypertension in a sample of US Latinos.

METHODS: We analyzed data from 2,148 participants of the Sueño Sleep Ancillary Study of the Hispanic Community Health Study/Study of Latinos (HCHS/SOL), who underwent 1 week of wrist actigraphy to characterize sleep duration, sleep efficiency, sleep fragmentation index, and daytime naps (\geq two naps of 15 minutes). Insomnia was defined as an Insomnia Severity Index \geq 15. Hypertension was defined based on self-reported physician diagnosis. Survey linear regression was used to evaluate the association of sleep measures with hypertension prevalence. Sensitivity analyses excluded participants with an apnea-hypopnea index (AHI) \geq 15 events/h.

RESULTS: The mean age was 46.3 ± 11.6 years, and 65% of the sample consisted of women. The mean sleep duration was 6.7 ± 1.1 hours. Thirty-two percent of the sample had hypertension. After adjusting for age, sex, ethnic background, site, and AHI, each 10% reduction in sleep efficiency was associated with a 7.5% (95% CI, -12.9 to -2.2; $P = .0061$) greater hypertension prevalence, each 10% increase in sleep fragmentation index was associated with a 5.2% (95% CI, 1.4-8.9; $P = .0071$) greater hypertension prevalence, and frequent napping was associated with a 11.6% greater hypertension prevalence (95% CI, 5.5-17.7; $P = .0002$). In contrast, actigraphy-defined sleep duration ($P = .20$) and insomnia ($P = .17$) were not associated with hypertension. These findings persisted after excluding participants with an AHI \geq 15 events/h.

CONCLUSIONS: Independent of sleep-disordered breathing, we observed associations between reduced sleep continuity and daytime napping, but not short sleep duration, and prevalent hypertension.

CHEST 2017; ■(■):■-■

KEY WORDS: Hispanic; hypertension; insomnia; sleep duration; sleep quality

ABBREVIATIONS: AHI = apnea-hypopnea index; HCHS/SOL = Hispanic Community Health Study/Study of Latinos; SDB = sleep-disordered breathing

AFFILIATIONS: From the Department of Neurology (Drs Ramos and Wallace), University of Miami Miller School of Medicine; the Neurology Service (Dr Wallace and Wohlgenuth), and the Psychology Service (Dr Wohlgenuth), Bruce W. Carter Department of Veterans Affairs Medical Center, Miami, FL; the Division of Sleep and Circadian Disorders (Dr Weng), Brigham and Women's Hospital, Boston MA; the College of Nursing and Health Innovation (Dr Petrov), Arizona

State University, Phoenix, AZ; the Collaborative Studies Coordinating Center (Dr Sotres-Alvarez), Department of Biostatistics, Gillings School of Global Public Health, University of North Carolina, Chapel Hill, NC; the Division of Pulmonary and Critical Care Medicine (Dr Loreda), University of California San Diego, San Diego, CA; the Department of Neurology (Drs Reid and Zee), Northwestern University, Chicago, IL; the Department of Epidemiology and Population Health (Dr Mossavar-Rahmani), Albert Einstein College of Medicine, Bronx, NY; and the Division of Pulmonary, Allergy, and Critical Care Medicine (Dr Patel), University of Pittsburgh, Pittsburgh PA.

Hypertension affects approximately 26.4% of the adult population worldwide and is expected to affect 1.5 billion people by the year 2025.¹⁻⁴ Nearly 13.5% of all deaths associated with chronic disease and half of all strokes are attributed to hypertension.^{3,4} Of importance, self-reports of short and long sleep durations are associated with increased risk of early mortality,^{5,6} stroke, and hypertension.⁶⁻¹⁰ Similarly, insomnia, a common sleep disorder seen in up to 15% of the US adult population, is associated with hypertension in some but not all studies.¹¹ However, most studies do not account for the confounding influence of sleep-disordered breathing (SDB), a known cause of hypertension.¹² In addition, self-reported sleep has been found to correlate only modestly with objectively measured sleep.¹³⁻¹⁵ There is a paucity of studies evaluating sleep duration with actigraphy, which provides a better estimate of sleep duration and simultaneously allows evaluation of additional dimensions of sleep continuity (sleep efficiency and sleep fragmentation index), as well as daytime napping.^{2,16}

Methods

Population

Hispanic Community Health Study/Study of Latinos: The Hispanic Community Health Study/Study of Latinos (HCHS/SOL) is a multicenter community-based cohort study examining the prevalence of and risk factors for chronic disease among 16,145 Hispanic/Latino adults from four urban areas (Bronx NY, Miami FL, Chicago IL, San Diego CA). Demographics, socioeconomic status, lifestyle habits, and medical history were collected during baseline assessments from 2008 through 2011.²⁰ This examination included an assessment of SDB with an unattended sleep apnea study (ARES Unicorder 5.2; B-Alert) obtained at home for one night, from which the apnea-hypopnea index (AHI) was measured, as previously described.²¹

Analytic sample: Sueño Ancillary Study: This study analyzed data from the Sueño Ancillary Study, which was designed to obtain further in-depth information on sleep habits through questionnaires and actigraphy in a subsample of 2,252 HCHS/SOL participants aged 18 to 64 years without severe sleep disorders from the years 2010 to

FUNDING/SUPPORT: This study was supported by NHLBI [Grants HL098297 and HL127307]. In addition, the Hispanic Community Health Study/Study of Latinos was carried out as a collaborative study supported by contracts from NHLBI to the University of North Carolina [Grant N01-HC65233], University of Miami [Grant N01-HC65234], Albert Einstein College of Medicine [Grant N01-HC65235], Northwestern University [Grant N01-HC65236], and San Diego State University [Grant N01-HC65237].

CORRESPONDENCE TO: Alberto Ramos, MD, MSPH, Department of Neurology, University of Miami Miller School of Medicine, 1120 NW 14th St, Ste 1350, Miami, FL 33136; e-mail: aramos@med.miami.edu

Copyright © 2017 American College of Chest Physicians. Published by Elsevier Inc. All rights reserved.

DOI: <https://doi.org/10.1016/j.chest.2017.09.028>

This study evaluates the cross-sectional association between actigraphy-defined sleep measures and prevalent hypertension independent of SDB in a diverse and large sample of Latinos, a group with a greater than twofold risk of stroke and a large burden of vascular disease.^{3,17-19} Latinos are one of the fastest-growing minorities in the United States, which has vast implications for US morbidity and health-care costs. Therefore, it is imperative to identify and address Latino-specific health needs.^{6,17-19} Our primary hypothesis is that shorter sleep duration is associated with prevalent hypertension independent of SDB. Prior studies showed the strongest associations between self-reported short sleep and hypertension among women.^{4,10} Therefore, we further evaluated sex as a moderator between short sleep and hypertension; we hypothesized that an association was stronger for women. Our secondary hypothesis was that measures of poor sleep quality (increased sleep fragmentation, decreased sleep efficiency, daytime napping, and insomnia) would also be associated with prevalent hypertension.

2013.^{22,23} There were 2,189 eligible participants in Sueño; 33 were excluded because they did not have at least 5 valid days of actigraphy, and eight were excluded for lack of hypertension data, leaving 2,148 for basic age- and sex-adjusted analyses. For multivariable analyses, there were 34 people with a missing covariate value who were removed from analyses, primarily due to lack of information from the sleep study monitor to calculate AHI. Both the baseline HCHS/SOL and the Sueño assessments were approved by the institutional review boards at each of the participating sites, and all participants provided written informed consent (e-Appendix 1).

Dependent Variable: Prevalent Hypertension

Hypertension was based on the self-report of a physician diagnosis of hypertension at the time of the Sueño examination. The Sueño definition was consistent ($P < .0001$) with the HCHS/SOL baseline definition of hypertension, which was based on a systolic BP ≥ 140 mm Hg or a diastolic BP ≥ 90 mm Hg or the use of antihypertensive medication. During baseline assessments, BP was measured on the participant's right arm while seated and rested for 5 minutes using an automated sphygmomanometer (Omron HEM-907 XL, Omron Healthcare, Inc.). The cuff size was matched to the participant using the measure of his/her upper arm circumference. Three sets of 1-min spaced BP measurements were taken from each participant (99% completion rate).³

Main Exposures: Sleep Duration, Sleep Continuity, and Daytime Napping

Seven days of wrist actigraphy with an Actiwatch Spectrum (Philips Respironics) was used to estimate sleep.^{22,23} Participants wore the actigraph on the nondominant wrist. Activity and light data, along with a sleep diary for each day, were collected throughout this period in 30-s epochs. Rest-sleep periods were identified using a standardized protocol and validated scoring algorithm alongside polysomnography on an epoch by epoch basis.²²⁻²⁴ Five or more

Download English Version:

<https://daneshyari.com/en/article/8658092>

Download Persian Version:

<https://daneshyari.com/article/8658092>

[Daneshyari.com](https://daneshyari.com)