Response to Poor Sleep With Normal Sleep Duration: A Preventive Effect on Incident Hypertension

We thank Dr Kawada for his comments on our recent article published in Hypertension. Dr Kawada points out that in previous studies long sleep duration has been associated with cardiovascular risk, whereas in our study poor sleepers with normal sleep duration were somewhat protected from developing hypertension. However, these studies differ substantially both in terms of methods and definitions used. In our study, sleep duration was measured objectively, and all subjects were recorded with polysomnography for a fixed time period of 8 hours. The reference group in our study consisted of those individuals without sleep complaints who slept ≥6 hours. In contrast, the studies cited by Dr Kawada measured habitual sleep duration with self-reports, used individuals reporting 7 to 8 hours of sleep as the reference group, and defined those reporting <6 hours and ≥9 hours of sleep as short and long sleepers, respectively. In population-based samples, self-reports of habitual sleep duration moderately correlate with objectively measured sleep but are biased by systematic overreporting; therefore, the findings of these studies cannot be directly compared. Nevertheless, we tested whether the squared and cubic terms of objective sleep duration, treated as a continuous variable, showed a significant association with incident hypertension. We did not find a significant deviation from a linear relationship and, hence, no evidence of a U-shaped relationship between sleep duration and incident hypertension, a finding that is consistent with a previous study using objective sleep measures. Based on these further analyses, we are not surprised that poor sleep with normal sleep duration is not associated with an increased risk of hypertension. Whether the combination of poor sleep and normal sleep duration protects from developing hypertension requires further study, including testing at multiple follow-ups.

Another interesting issue raised by Dr Kawada is whether poor sleepers with normal sleep duration may change in sleep status over time and eventually be at risk for cardiovascular morbidity. In a previous study, we showed that =17% of poor sleepers become chronic insomniacs and that objective short sleep duration is a predictor of the development of full-blown chronic insomnia among poor sleepers; thus, it is unlikely that poor sleepers with normal sleep duration will become over time chronic insomniacs with short sleep duration. These findings further support that objective short sleep duration is a biological marker that predicts both the severity and the natural course of the disorder.

We agree with Dr Kawada that the use of polysomnographic measures provides strong validity for the findings reported in our study and that future longitudinal studies using longer and multiple follow-ups should further examine the relationship among the natural history of insomnia, objective sleep duration, and cardiovascular risk.

Sources of Funding
This research is funded in part by the National Institutes of Health grants RO1 51931, RO1 40916, and RO1 64415.

Disclosures
None.

Julio Fernandez-Mendoza
Alexandros N. Vgontzas
Sleep Research and Treatment Center, Department of Psychiatry
Pennsylvania State University College of Medicine
Hershey, PA

Duane Liao
Michele L. Shaffer
Department of Public Health Sciences
Pennsylvania State University College of Medicine
Hershey, PA

Antonio Vela-Bueno
Sleep Research and Treatment Center, Department of Psychiatry
Pennsylvania State University College of Medicine
Hershey, PA

Edward O. Bixler
Sleep Research and Treatment Center, Department of Psychiatry
Pennsylvania State University College of Medicine
Hershey, PA

Response to Poor Sleep With Normal Sleep Duration: A Preventive Effect on Incident Hypertension

Julio Fernandez-Mendoza, Alexandros N. Vgontzas, Duanping Liao, Michele L. Shaffer, Antonio Vela-Bueno, Marie Basta and Edward O. Bixler

Hypertension. 2013;61:e12; originally published online December 24, 2012;
doi: 10.1161/HYPERTENSIONAHA.111.00444

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://hyper.ahajournals.org/content/61/2/e12

An erratum has been published regarding this article. Please see the attached page for:
/content/61/5/e49.full.pdf

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Hypertension can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Hypertension is online at:
http://hyper.ahajournals.org/subscriptions/
Correction

In the *Hypertension* article by Fernandez-Mendoza et al (Fernandez-Mendoza J, Vgontzas AN, Bixler EO, Liao D. Response to Poor Sleep With Normal Sleep Duration: A Preventive Effect on Incident Hypertension. *Hypertension*. 2013;61:e12), a correction was needed.

Not all of the authors were listed in this Letter to the Editor response. The complete author listing is as follows:

**Julio Fernandez-Mendoza**

Alexandros N. Vgontzas  
*Sleep Research and Treatment Center, Department of Psychiatry*  
*Pennsylvania State University College of Medicine*  
*Hershey, PA*

**Duanping Liao**

Michele L. Shaffer  
*Department of Public Health Sciences*  
*Pennsylvania State University College of Medicine*  
*Hershey, PA*

**Antonio Vela-Bueno**

*Department of Psychiatry*  
*School of Medicine*  
*Autonomous University*  
*Madrid, Spain*

**Marie Basta**

*Department of Psychiatry*  
*School of Medicine*  
*University of Crete*  
*Crete, Greece*

**Edward O. Bixler**

*Sleep Research and Treatment Center, Department of Psychiatry*  
*Pennsylvania State University College of Medicine*  
*Hershey, PA*

This correction has been made to the current online version of the article, which is available at [http://hyper.ahajournals.org/content/61/2/e12.full](http://hyper.ahajournals.org/content/61/2/e12.full).