Editor's Note: Authors are invited to respond to Correspondence that cites their previously published work. Those responses appear after the related letter. In cases where there is no response, the author of the original article declined to respond or did not reply to our invitation.

Relationship Between Sleep Parameters and Lipid Profile With Special Reference to the Validity of Actigraphy

To the Editor:

I read with interest the article by Toyama et al.1 in a recent issue of CHEST (March 2013). They conducted a cross-sectional study to examine the relationship between sleep indicators and lipid profiles in 275 working men. OSA and sleep duration were judged by specific devices. Among them, I have some concerns about the device Actiwatch (Philips Respironics) and its ability to determine sleep duration.

First, the authors mentioned in the Materials and Methods section that sleep duration was estimated from analysis of actigraphy tracings in conjunction with a sleep diary. Unfortunately, they did not describe procedures, and they cited only one reference for the use of actigraphy to estimate sleep-wake time.2 There is a review on the usefulness of actigraphy,3 but systemic discrepancies between actigraphy and EEG-defined sleep also exist. For example, subjects generally become inactive in a sleep-induction period, which would relate to the underestimation of sleep-onset latency.4

Second, there are several commercially based actigraphs and different scoring methods that do not have the same performance for the detection of sleep-wake judgment.5 I have a query on the information of validation for Actiwatch, which was used by Toyama et al. Actigraphy is an accelerometer and it does not reflect sleep itself. The cutoff value of sensitivity for making sleep-wake judgment by actigraphy may improve accuracy in assessing the severity of OSA compared with polysomnography as a gold standard.

The authors described mean (SD) of sleep duration in their Table 1 as 6.12 (0.72) and 5.93 (0.86) in subjects without dyslipidemia and with dyslipidemia, respectively. They also categorized subjects into four groups according to sleep duration in their Table 2. Furthermore, sleep duration was also used for a stepwise linear regression model to predict several lipid profiles. I think that the stable estimates of sleep duration are important for their study, and I strongly recommend that the authors describe precisely the procedure of actigraphy tracings in conjunction with sleep diary.

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REFERENCES

Response

To the Editor:

We thank Dr Kawada for his thoughtful comments regarding our study.1 Dr Kawada expressed concern about our use of actigraphy to measure sleep duration. In our previous study of male employees of an urban wholesale company in Japan2 (cited as reference 30 in the study), we had more completely described the method of calculation of sleep duration. In that report, we stated, sleep duration was estimated from analysis of the wrist actigraphy tracing in conjunction with a sleep diary. The times at which the participant went to bed and got out of bed were obtained from the diary. Sleep onset was estimated by noting sustained cessation of wrist movement on the actigraphy tracing. The time of awakening was noted by the appearance of wrist movements on the actigraphy tracing. Sleep durations were the estimated length of time between the sleep onset and the final awakening.

In addition, the determinants of sleep at onset and the final awakening by actigraphy were visually inspected by two researchers who were accustomed to the actigraph.3 We know that combined with a validated method of monitoring respiratory events, the use of actigraphy may improve accuracy in assessing the severity of OSA compared with only using time spent in bed.4 However, the accuracy of actigraphy, as evaluated by Bland-Altman methods, declined in patients with more severe sleep apnea.5 Therefore, in these studies, we used the actigraph only to determine sleep onset and the time of awakening by visual inspection in addition to referring to the sleep diary1,2 because some of the study participants had severe OSA.

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