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LETTERS TO THE EDITOR

Oximetry data affect the quality of gold standard polysomnography

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In the October issue of the *Journal of Clinical Sleep Medicine*, Ioachimescu et al[1] presented "Performance of peripheral arterial tonometry–based testing for the diagnosis of obstructive sleep apnea in a large sleep clinic cohort," a study reporting simultaneous comparison of home sleep apnea testing using WatchPAT technology with polysomnography (PSG). The study reported the peripheral arterial tonometry (PAT) accuracy to be 53% with the bias toward overestimation apnea events. These findings differ significantly from all other published PAT apnea-hypopnea index (AHI) validation studies that reflect correlation of greater than 85%.[2–4]

In the October study, approximately 27% and 31% of participants had moderate and severe obstructive sleep apnea, respectively. The PSG median oxygen desaturation index (ODI) 3% was 2.5 events/h, whereas the PSG median AHI 3% was 18.4 events/h. This suggests that the majority (≈85%) of respiratory events were arousal hypopneas or apneas with no desaturation. This seems unusual for a population of mostly older adult males with obesity and with high probability of obstructive sleep apnea (based on Berlin Questionnaire and Epworth Sleepiness Scale). In addition, there is a significant disagreement between the PSG median ODI 4% reported to be 0.5, which by itself is unusually low for the studied population, and PAT median ODI 4% of 10.9. This suggests that the discrepancy between PSG AHI and PAT AHI relates to oximetry measurement and not a difference in the PAT scoring algorithm.

The PSG ODI 4% in this study is inconsistent with studies published previously. For instance, among 5304 PSG studies, Escourrou et al[5] reported a mean ODI of 23.0 among a cohort of patients with fewer obstructive sleep apnea comorbidities. Also, the mean AHI was 31 events/h, reflecting a ratio of ODI to AHI of 3:4. This suggests the results from Ioachimescu et al[1] are not typical, where the ratio of ODI to AHI was surprisingly 1:6.

As PSG is the gold standard for determining both a diagnosis and the severity of sleep-disordered breathing, here we question the accuracy of the PSG oximetry data that, consequently, may have resulted with considerable underestimation of hypopnea events and therefore PSG AHI. We are also aware of limitations in the performance of multiple use oximetry sensors, especially the clip-on variety suspectedly used in this study, which often translate to a smoothed SpO_2 signal with shallower desaturations.

Ioachimescu et al[1] concluded that the PAT home sleep apnea testing algorithm lacks accuracy and, in particular, overestimates AHI vs PSG. Alternatively, we assert that considering the highly suspect oximetry data, these data do not support that conclusion. We suggest that the PSG AHI was lower than expected, driven by the unusually low PSG ODI rather than overestimation of WatchPAT AHI.

CITATION

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DISCLOSURE STATEMENT

The author has seen and approved the manuscript. Dr. Cook is employed by Itamar Medical, the manufacturer of the WatchPAT device.