LETTERS TO THE EDITOR

Home portable monitoring for the diagnosis of sleep-disordered breathing in adolescents and adults with neuromuscular disorders: not yet ready for prime time

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I read with interest the article by Westenberg et al., entitled “Validation of home portable monitoring for the diagnosis of sleep-disordered breathing in adolescents and adults with neuromuscular disorders.” The effort of the authors to validate the home sleep apnea test (HSAT) in an adolescent population is laudable. However, this is in contradiction to American Academy of Sleep Medicine (AASM) guidelines: “CO2 monitoring is important in children in whom there is concern regarding nocturnal hypoventilation, such as children with neuromuscular disease, underlying lung disease, or obesity hypoventilation, and most home testing devices do not include a transcutaneous or end-tidal CO2 channel.”

If you plan to advance the use of HSAT in an adolescent population, it is ideal to exclude patients with neuromuscular disorder (NMD). The AASM Scoring Manual identifies separate respiratory rules for scoring of pediatric sleep studies. This includes an option to score a hypopnea if an event is associated with an arousal, rather than just a 3% oxygen desaturation, which requires electroencephalography monitoring. The pediatric respiratory rules also recommend monitoring hypoventilation in children during a diagnostic study, which requires carbon dioxide monitoring. Duchenne muscular dystrophy (DMD) (3 of 6 patients) sleep-related hypoventilation tends to precede daytime hypoventilation; is due to both decreased respiratory drive, and muscle weakness; and often coexists with obstructive sleep apnea from associated pharyngeal muscle weakness.

Their sample of pediatric population consisted of only 6 adolescent patients with NMD, which is insufficient to draw any conclusion. This would need a much larger clinical study. The bias in the apnea-hypopnea index (AHI) between polysomnography and HSAT was -10.8 ± 24.7 events/h, with HSAT consistently underestimating the AHI. The difference between Respiratory Disturbance Index (RDI)- polysomnography and RDI-HSAT was -7.4 ± 28.5 events/h. This is clinically significant as this can change the severity of the sleep apnea diagnosis and therefore management of these patients.

The authors found that HSAT has high specificity at all 3 predetermined cutoff values of AHI. But the sensitivity of 0.50 and 0.38 for AHI > 15 and AHI > 30 events/h, respectively, shows that this is not ready for prime time in an adolescent population in general and specifically in patients with NMD due to concerns with benefit-risk profile.

Their study shows that feasibility in adolescent patients was poorer, with only 1 of 6 successful recordings on the first try and 2 of 4 attempted repeats. Implementation of Portable Monitoring (PM) may still need further refinement to improve signal stability and additional studies would be needed that carefully evaluate their accuracy in the setting that these were originally developed for, in the child’s home, where the study would be unattended. This should be done concomitantly with a type II sleep study (polysomnography done at home) as the gold standard in comparison to HSAT.

The authors claim that “We found that HSAT using the Alice PDX monitor (device manufactured by Phillips) is feasible in a selected group of patients with NMD at risk for Sleep Disordered Breathing (SDB).” While HSAT in these populations may be feasible at home, device outputs may not be accurate to drive clinical management. Even in pandemic times, treating patients optimally is more essential than cost saving, as eventually this may result in repeat tests and delayed management.

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REFERENCES


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