Another view of phenotypic evaluation in obstructive sleep apnea

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TO THE EDITOR: The most efficient treatment to obstructive sleep apnea (OSA) is continuous positive airway pressure (CPAP), which produces pressure able to open the upper airway, thereby restoring the normal respiratory flow (2, 4). Wellman et al. (6) recently reported that the CPAP is a therapy directed for use only in patients with the abnormal anatomy trait in OSA. Therefore, they suggest a revised method to phenotypically evaluate patients with OSA, according to other parameters: passive $V_0$ (ventilation at a nasal pressure of 0 cmH2O), loop gain, arousal threshold, and upper airway gain.

In this article, the authors evaluated 13 patients treated with CPAP (3 healthy and 10 with OSA) and found a marked variability in phenotypic traits independent of their OSA severity. This study also demonstrated that the proposed evaluation method was fairly accurate, indicated by a significant positive correlation between apnea hypopnea index (AHI) and loop gain magnitude, and a negative correlation to passive $V_0$.

The main relevance of these findings was to create a new and reviewed model able to capture and analyze the huge individual variation in respiratory parameters in OSA patients, and for this innovative aspect the authors deserve congratulations. Despite this original methodology, we suggest that other issues should be considered. The analyses were conducted with 13 patients, including men and women, between the ages of 21 and 65 years. On the basis of previous reports that OSA is more common in men of an advanced age and men who are overweight (see Ref. 5, and references therein), we believe that the effects of age, sex, and weight should be considered in the analyses. Furthermore, to validate the method and its reproducibility, an increase in the sample size should be considered.

The subjects were classified with OSA when AHI > 10 events per hour. The respiratory parameters were evaluated during supine non-rapid eye movement sleep (NREM). As sleep apnea occurs primarily during REM sleep (1, 4), the phenotype of OSA patients would be better characterized by evaluating the respiratory events during this phase of sleep. Moreover, separating the sample according to AHI would provide a possible effect of OSA severity on the phenotypic parameters. Finally, it would be interesting to correlate these phenotypic traits with different sleep parameters, including sleep efficiency and latency.

Combining the standard diagnostic methods for OSA, such as polysomnography and clinical investigation, and the phenotypic trait evaluation proposed by Wellman et al. (6) with the modifications suggested above, could improve the ways to define the profile of each individual patient. This, in turn, would allow for better determination of the best CPAP pressure for each level of severity of OSA.

DISCLOSURES
No conflicts of interest, financial or otherwise, are declared by the authors.

AUTHOR CONTRIBUTIONS
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