Validation study of an innovative device to screen sleep respiratory disorders

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Introduction

A simple and reliable screening tool is a real need to couple the epidemiology of obstructive sleep apnea (OSA) with the resources available in sleep laboratories, particularly in patients with OSA and comorbidities who often do not have symptoms (i.e.: somnolence).

Methods

Airgo™ is an innovative device consisting of a comfortable elastic band and a microprocessor to be positioned in the lower chest, which continuously calculates tidal volume and respiratory rate. Three accelerometers accurately measure the body position.

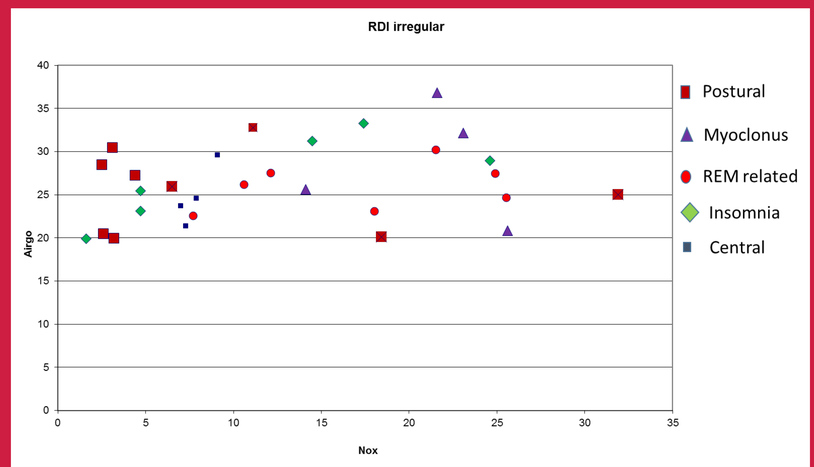
The occurrence of respiratory events during sleep is based on the phasic reduction of minute ventilation compared to last minute mean, and the automatic analysis discriminates central and obstructive events offering a respiratory disturbance index (RDI) at every 10% of ventilation reduction. We tested the device in 130 consecutive patients (24 females) simultaneously undergoing a cardiorespiratory monitoring (Nox T3).

Aims and objectives

To test the reliability of a simple screening tool (Airgo™) in allocating patients to mild, moderate or severe OSA group vs standard cardiorespiratory monitoring.

Performance of AirGo vs Nox T3

AirGo classification	Nr patients	Sensitivity	Specificity	PPV	NPV
Severe OSA	39	100%	95.6%	94.9%	100%
Moderate OSA	20	78.6%	86.9%	55%	95.2%
Low probability OSA	24	71,8%	98%	95,8%	84,7%
Postural OSA	28	100%	100%	100%	100%



Results

The mean age of pts (± SD) is 55.7±12.8 yrs, BMI 27.8±4.3 kg/m2, AHI 22,0±22.0 events/hr. The trend of Airgo™ RDI in the deciles 30-50% is the best descriptor of respiratory disorder.

Airgo™ correctly allocated to the severe group 37 out of 39 patients (PPV 95% NPV 100%) and appropriately scored 23 out of 24 patients with AHI < 10. In 30 pts Airgo™ showed an irregular trend, caused by a coexisting disorder (Figure). In the group identified as moderate OSA the RDI overestimates compared to NoxT3 and 9 out of 20 patients had AHI< 10.

Conclusion

Airgo™ is a promising screening tool to stratify the occurrence of respiratory sleep disorders, identifying pts with severe OSA, pts without RBD, pts with irregular breathing and with mild-to-moderate disease. The performance is excellent in discriminating postural OSA.

Reference

Antonelli A et al. Comparison between the Airgo™ device and a metabolic cart during rest and exercise.

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