Validation study of a new analysis software to screen sleep respiratory disorders

Apnoea / Hypopnea, Diagnosis, Monitoring

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Introduction: The preliminary results on the reliability of Airgo™, a new screening tool for respiratory sleep disorders, prompted an improvement in software analysis to properly assess the occurrence and the severity of respiratory sleep disorders.

Aim and objectives: To test the reliability of an improved software release in allocating patients to mild, moderate or severe obstructive sleep apnea (OSA) group vs standard cardiorespiratory monitoring (CRM).

Methods: Airgo™ is an innovative device consisting of a comfortable elastic band and a small box containing a microprocessor and 3 accelerometers. It is positioned over the lower chest and continuously calculates tidal volume and respiratory rate, detecting respiratory events during sleep and body position. We tested the device in 120 consecutive patients (21 F) simultaneously undergoing a CRM (Nox T3). The trend of AHI in the deciles 30-50% is the best descriptor of respiratory disorder.

Results: The mean age of pts (± SD) is 55.7±13 yrs, BMI 27.8±4.3 kg/m^2, AHI 22±22 events/hr. Airgo classified properly 27 severe OSA pts, 16 postural OSA (pOSA), 16/19 non-OSA pts (3 FP), 35/40 mild-to-moderate OSA (3 scored severe and 2 false negative) and 14/16 pts (2 false negative) with irregular breathing of non-OSA origin. In the OSA group the overall sensitivity is 97.5%, with 94% positive predictive value and 89% negative predictive value. The system provides advanced visualization techniques that assist the doctor in eliminating false negatives and in identifying periodic breathing patterns otherwise hidden.

Conclusions: Airgo™ is a promising screening tool to stratify the occurrence of respiratory sleep disorder, identifying pts with severe OSA, pts with postural OSA, pts with irregular breathing and with mild-to-moderate disease providing data visualization useful for phenotyping patients.