

Choice of Oximeter Affects Apnea-Hypopnea Index.

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Introduction

Current Medicare guidelines include an apnea-hypopnea index (AHI) \geq 15 events per hour, in which all hypopneas must be associated with 4% desaturation, to qualify for reimbursement for therapy with continuous positive airway pressure (CPAP). The present data demonstrate the effect of pulse oximeter differences on AHI.

Methods

Design: Prospective study, blinded analysis. *Setting:* Academic sleep disorder center. *Patients:* One hundred thirteen consecutive patients (84 men and 29 women) undergoing diagnostic sleep studies and being evaluated for CPAP based on the Medicare indications for reimbursement. *Interventions:* Patients had two of four commonly used oximeters with signal averaging times of 4 to 6 s placed on different digits of the same hand during nocturnal polysomnography.

Results

Apneas and candidate hypopneas (amplitude reduction, $> 30\%$) were scored from the nasal cannula airflow signal without reference to oximetry. Candidate hypopneas then were reclassified as hypopneas by each oximeter if they were associated with a 4% desaturation. Although the use of three oximeters resulted in a similar AHI (bias, < 1 event per hour), the fourth oximeter showed an overall increase in AHI of 3.7 events per hour. This caused 7 of 113 patients to have an AHI of ≥ 15 events per hour (meeting the Medicare criteria for treatment) by one oximeter but not when a different oximeter was used. More importantly, when our analysis was limited to those patients whose number of candidate hypopneas made them susceptible to the threshold value of 15 events per hour, 7 of 35 patients who did not meet the Medicare AHI standard for treatment by one oximeter were reclassified when a different oximeter was used.

Conclusions

In the present study, oximeter choice affected whether the AHI reached the critical cutoff of 15 events per hour, particularly in those with disease severity that was neither very mild nor very severe. As oximetry is not a technique that produces a generic result, there are significant limitations to basing the definition of hypopnea on a fixed percentage of desaturation in determining the eligibility for CPAP therapy.