

Influence of Pulse Oximeter Technology on Hypopnea Diagnosis using the Newly Proposed Definition of a Respiratory Hypopnea.

Whitman R.A., Garrison M.E., Oestriech P.J. *Sleep*. 2002;25:A509(727.R).

Introduction

New guidelines for scoring a respiratory hypopnea proposed by AASM¹ have recently been adopted by Medicare in consideration of coverage of nasal CPAP therapy, replacing the 30-apnea rule (Coverage Decision Memorandum for CPAP, October, 30, 2001). These guidelines require a measurable desaturation of 4% or greater in conjunction with a minimum of a 30% reduction in airflow or effort to qualify the respiratory event as a hypopnea. The aim of this study was to establish if the fidelity of different pulse oximeter technologies could influence the scoring of hypopneas.²

Methods

Twenty nine patients referred to the sleep disorders laboratory for evaluation of possible sleep disordered breathing were studied using three different oximeters, a Masimo Radical with SET V3 technology (M), a Nellcor N-395 (N3) and a Nellcor N-200 (N2). The N-200 was placed in Mode 2 configuration, which has a stated data averaging time of 2 to 3 seconds. The Radical was configured in the 2-second data averaging mode. The N-395 does not have a user-selectable averaging mode. All three oximeters were turned on simultaneously at the beginning of the study and turned off simultaneously at the termination of the study. The data from all three oximeters were downloaded into PROFOX oximetry analysis software (version PFWS 08/99). Two saturation indices, mean saturation and number of desaturations $\geq 4\%$ were extracted from the report and analyzed.

Results

There were no differences in mean saturation between N, N3 and N2 ($95.8 \pm 1.7\%$, $95.9 \pm 1.8\%$, $95.9 \pm 1.5\%$ respectively.) There was a large difference in the number of desaturations greater than or equal to 4% between the three oximeters. The mean number of desaturations were 81 ± 89 , 48 ± 55 and 31 ± 35 for M, N3 and N2 respectively. The Masimo Radical detected 69% more desaturations $\geq 4\%$ than the Nellcor N-395 and 161% more desaturations $\geq 4\%$ than the Nellcor N-200. The Nellcor N-395 identified 55% more desaturation $\geq 4\%$ than the Nellcor N-200.

Conclusions

In this population of patients, three different pulse oximeter technologies gave significantly different results for the number of desaturations $\geq 4\%$ while the overall mean saturation was the same for all oximeters. This difference between pulse oximetry technologies in detecting the degrees of desaturation from baseline could have an important impact on qualifying patients for nasal CPAP coverage under the new Medicare reimbursement rules.