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The Use of a Fully Automated Automatic Adaptive Servoventilation Algorithm in the Acute and Long-term Treatment of Central Sleep Apnea

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BACKGROUND: Central sleep apnea (CSA), in association with obstructive disordered breathing, occurs in patients using opioids long-term and those with congestive heart failure. In these patients, treatment with CPAP frequently fails. The current adaptive servoventilation (ASV) devices are promising for the treatment of complex sleep-disordered breathing. These devices use algorithms to automatically titrate expiratory and inspiratory pressures. We hypothesized that an ASV device operating automatically would significantly reduce the frequency of breathing events in patients with mixed sleep apnea during polysomnography and with 3 months of treatment.

METHODS: This was a prospective, multicenter, observational trial. Patients completed 3 nights of attended polysomnography, scored at an independent center. Twenty-seven patients with an apnea-hypopnea index (AHI) ≥ 15 and a central apnea index (CAI) ≥ 5/h underwent automated ASV titration without technician intervention. Twenty-six patients (96%) used ASV at home for 3 months.

RESULTS: Patients had an AHI of 55 ± 24 (mean ± SD) and CAI of 23 ± 18 at baseline. Overnight, ASV titration improved AHI, CAI, obstructive apnea, and arousal index significantly. Patients reported better sleep quality on ASV than CPAP. Over 3 months, ASV remained effective (median AHI 11 vs four during polysomnography). Mean adherence was 4.2 h per night. Epworth Sleepiness Scale decreased from 12.8 to 7.8 ($P = .001$).

CONCLUSIONS: The ASV device treated complex breathing disorders using automated algorithms. Compared with CPAP, patients reported improved sleep quality. Home use of ASV remained effective with acceptable adherence and improvements in daytime sleepiness.

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