

Why is it Important to Screen for Central Sleep Apnea?

From time to time we encounter an individual who claims screening for central sleep apnea is not necessary because it is a rare sleep disorder. Though the precise prevalence of central sleep apnea may be uncertain, some studies have suggested predominant central sleep apnea is seen in less than 10% of patients referred to a sleep laboratory and the prevalence of central sleep apnea is less than 1% of the population.¹ However, differential diagnosis is routine practice in medicine and accurate, proper differentiation of central sleep apnea from obstructive sleep apnea is both cost effective and a common sense approach when performing home sleep apnea recordings. Herein, we report an interesting case which clearly illustrates why it is important to screen for central sleep apnea.

The subject is a male healthcare professional aged 52 years diagnosed with moderate obstructive sleep apnea based on a Type 1 polysomnogram and prescribed a CPAP for treatment. He reported no other comorbid conditions. He requested two unattended follow-up tests: one a new baseline without CPAP and a second test the following night while wearing his CPAP. He agreed to use the BRAEBON MediByte Jr, a very simple to operate Type 3 device to record obstructive, central, and mixed apnea, hypopnea, positional apnea, snoring and flow limitation using three biosensors: an SpO₂ finger probe, a thoracic RIP effort belt, and a patented oronasal cannula. During the second night's recording, the MediByte Jr was connected to the CPAP circuit to record CPAP flow and CPAP pressure (at mask). Our experience has been that CPAP pressure at mask is about 0.5 - 1 cm H₂O less than CPAP pressure at source.

Night one was the baseline night with a total recording time was 321 minutes and CPAP was not used. The AHI was 24.1 and the data were validated by a registered polysomnographic technologist according to published guidelines² The overall AHI was consistent with moderate apnea reported during his previous test. However, of the 129 sleep disordered breathing events observed during the MediByte Jr recording, 59 events were central apneas, 7 were obstructive, 22 were mixed, and 41 were hypopneas. The central sleep apnea index was 11.0 at baseline. There were 38 desaturations of $\geq 4\%$ during the recording. Figure 1 shows an example of a central apnea event and Figure 2 displays graphical summary data for the entire night.

Night two was performed the next evening using a MediByte Jr to record both CPAP Flow and CPAP pressure. Total recording time was 318.5 minutes. Otherwise, the recording parameters and environment were identical. It is of particular interest that the overall AHI *increased* to 31.1 on CPAP during night two and the central sleep apnea index *increased* to 17.7 (from 11.0). This is not surprising given the complex nature of central sleep apnea. During the second night, the total number of apneas and hypopneas increased to 165 (from 129): 94 events were central apneas (from 59), 4 were obstructive, 26 were mixed, and 41 were hypopneas. The number of peripheral oxygen desaturations of $\geq 4\%$ increased to 97 events (from 38 the night before). Figure 3 shows recurring central apnea events and Figure 4 is a graphical summary of night two while wearing CPAP.

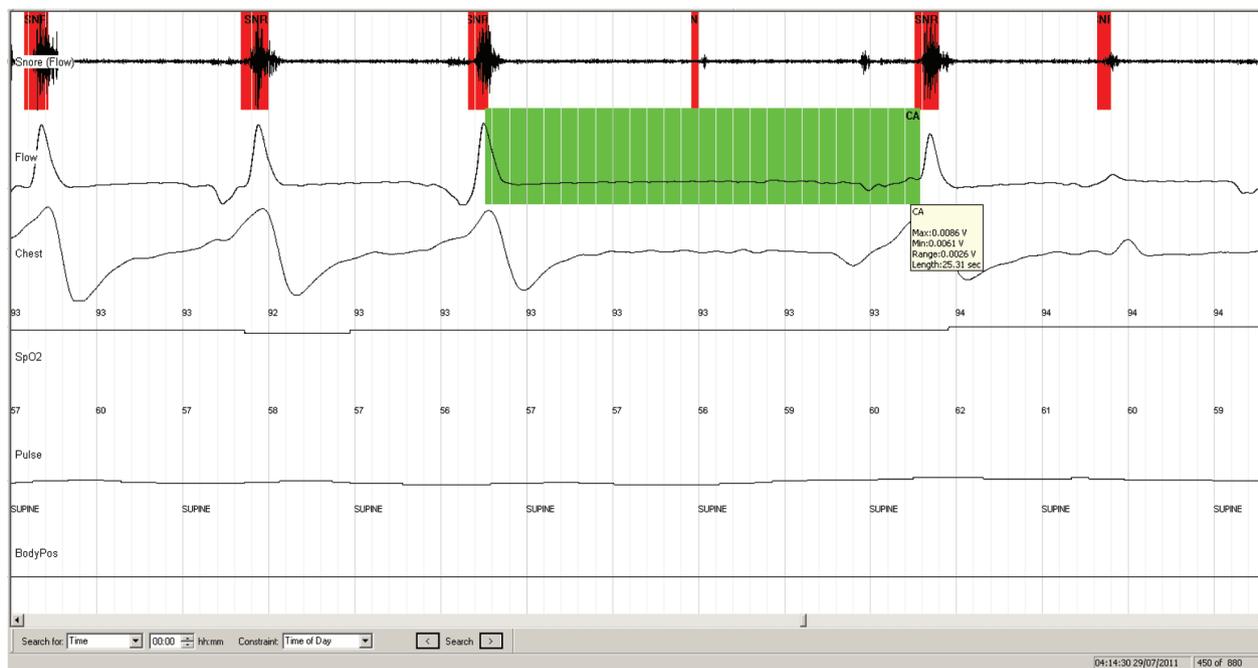


Fig. 1. Example of central apnea approximately 25 seconds in length recorded during night one using a MediByte Jr.

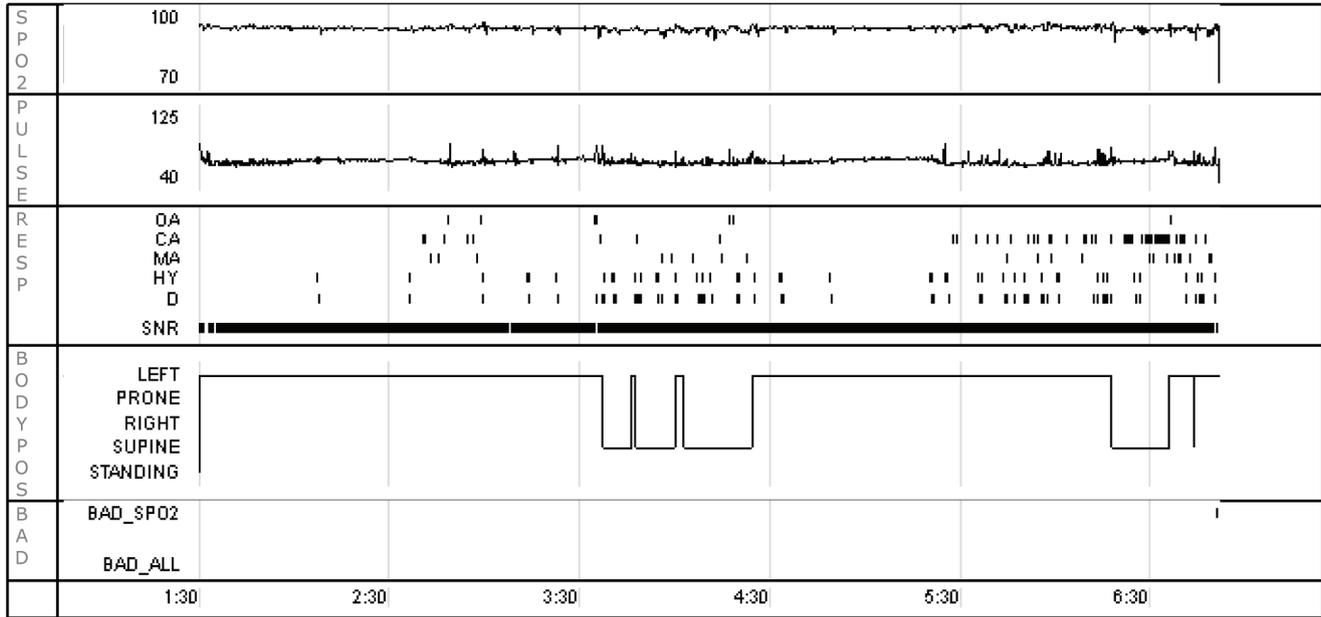


Fig. 2. Night one baseline data without CPAP.

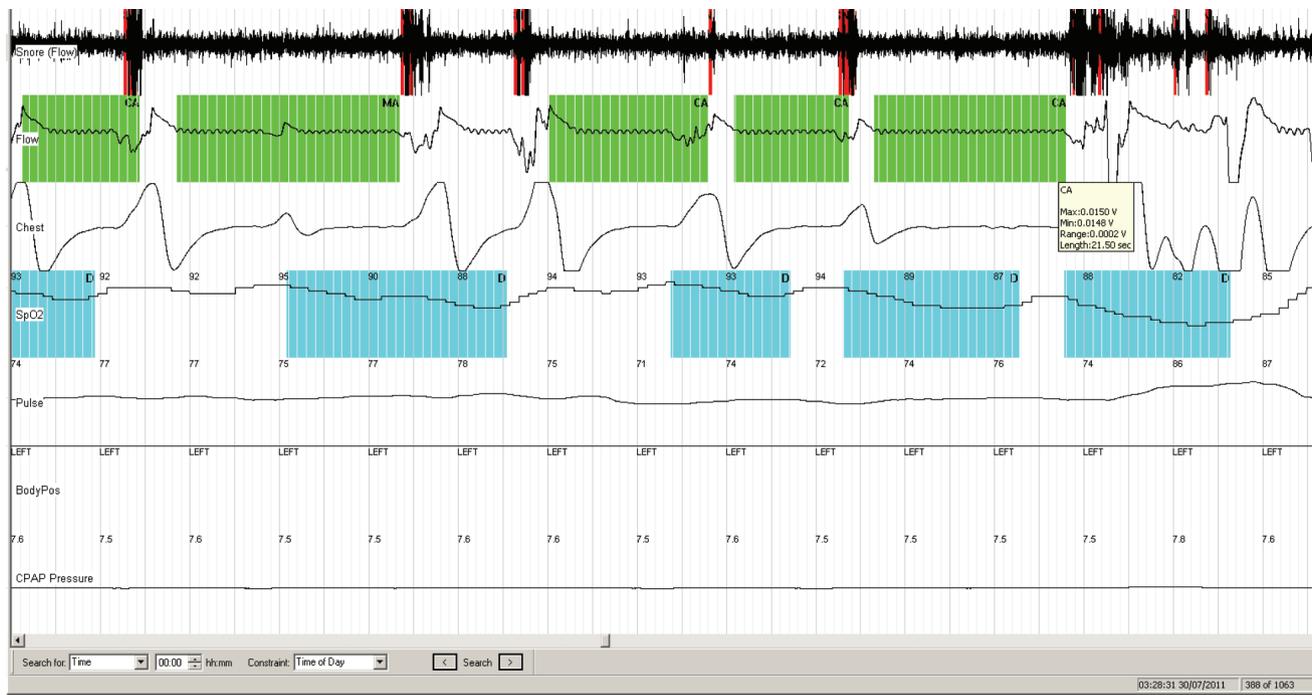


Fig. 3. Example of central sleep apnea during night two while using CPAP. The last central apnea event shown on the right is 21.50 seconds in length followed by a 10% SpO₂ desaturation to 81%. The high frequency oscillations on the Flow channel are indicative of the CPAP connection.

Summing it up

While the determination of central sleep apnea is usually straightforward, establishing appropriate therapy is more challenging. Central sleep apnea is often associated with other medical conditions, such as Cheyne-Stokes respiration, and treatment is usually more multifaceted than with obstructive sleep apnea.³ This case clearly illustrates that when evaluating sleep apnea it is absolutely essential that home sleep apnea

recording technology must be used which permits accurate differential diagnosis of central sleep apnea from obstructive sleep apnea. Had ventilatory effort not been recorded an accurate determination of central sleep apnea would not have been possible. Fortunately, sufficient parameters were recorded during the unattended test and the person was advised to return to the sleep specialist for consultation. This case also shows the utility of home sleep apnea testing

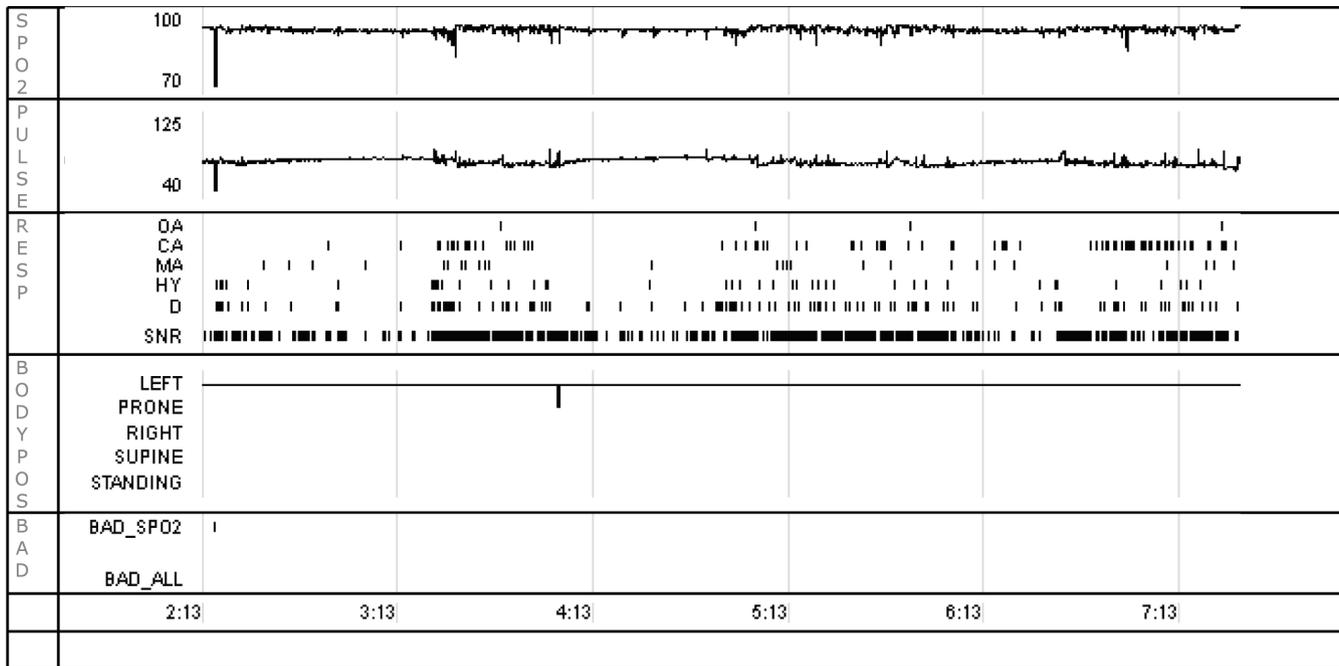


Fig. 4. Night two using CPAP. Comparison with baseline night (Figure 2) readily shows worsening SpO₂ and increased respiratory events while on CPAP in this case of central sleep apnea.

for periodic reassessment. The role of home sleep apnea testing will continue to evolve as it remains a cost-effective, convenient, and patient-preferred method to assess the varieties of sleep apnea and sleep disordered breathing in general.

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