OPEN ACCESS Freely available online

Journal of Sleep Disorders & Therapy

Commentary

Diagnosis of Sleep Apnea by Using Different Parameters

Laura Alia*

Department of Family Medicine and Public Health, University of California, Los Angeles, USA

DESCRIPTION

Sleep apnea is a sleep disorder that interferes with the breathing of a sleeping person. It is widespread in both the adult and adolescent populations. People who suffer from sleep apnea experience a period of light or no breathing during sleep. The former condition, in which breathing temporarily stops, is called apnea, and the latter condition, with periods of shallow breathing or diminished airflow, is called hypopnea. Clinical comorbidities can result from both disorders and are therefore detrimental to human well-being. Physiological symptoms of sleep apnea include snoring, gasping in the air during sleep, awakening with thirst, and generally poor sleep quality, as well as low attention, insomnia and decrease in cognitive skills, accidents, memory loss and depression. In addition to poor quality of life due to sleep deprivation and malaise, sleep apnea can cause serious problems such as diabetes, cardiovascular problems, high blood pressure, nervous system problems, and liver problems. Due to the worldwide prevalence of sleep apnea and the long-term direct and indirect problems it poses, it is important to diagnose and treat this condition.

There are three types of sleep apnea:

- Obstructive Sleep Apnea (OSA) is caused by a dysfunction of the upper airways. When the hard palate muscles in the back of the throat that support this soft palate relax, the soft palate blocks the passage of air into the airways. This leads to a short pause in breathing.
- Central Sleep Apnea (CSA) occurs when the brain is unable to generate or transmit signals that control the respiratory muscles. This leads to short durations of time when the person does not breathe at all.
- Complex sleep apnea syndrome presents with persistent central apnea, even after the obstructive event has been resolved with PAP therapy.

Clinical symptoms of sleep apnea include oxygen saturation, respiratory effort, and heart rate variability. The PSG test is the gold standard for diagnosing this condition. This test is conducted in a special sleep laboratory under the supervision of trained personnel. It takes time and the individual needs to be connected to a device that measures various biomedical and physiological parameters. This test monitors upper respiratory tract flow, respiratory effort, and biomedical and physiological parameters such as Electroencephalogram (EEG), Electrocardiogram (ECG), and Oxygen Saturation (SpO_2). EEG helps detect electrical activity and related disorders in the brain. This is measured on an EEG machine. ECG analyzes heartbeat rhythm and blood flow to the myocardium and is measured with an ECG machine or single-lead ECG. SpO_2 indicates the oxygen saturation in the blood. A pulse oximeter is used to measure SpO_2. In addition, thoracic and abdominal signals, as well as acoustic signals generated by breathing effort or snoring, can help detect sleep apnea.

Various parameters useful for diagnosing sleep apnea can be derived from the above signals. Analysis of ECG yields Heart Rate Variability (HRV), ECG-Derived Respiration (EDR) and Cardio-Pulmonary Coupling (CPC).

- HRV measures the variation in the time interval between continuous heartbeats, called the R-R interval. This includes paying special attention to signal quality, eliminating background noise, and using a sensitive R-wave detection algorithm. In addition, HRV is difficult to interpret in patients with atrial fibrillation and those with arrhythmias.
- EDR measures respiratory activity from ECG. Breathing efforts cause changes in the position of the ECG electrodes, which in turn affect the amplitude of the ECG signal. EDR is a surrogate respiration signal derived from the amplitude fluctuation of the ECG signal.
- CPC quantifies the degree of coherent coupling between HRV and fluctuations in R-wave amplitude caused by modulation of respiratory tidal volume. CPCs can be coupled at High or Low Frequencies (HFC, LFC). The former shows stable sleep and the latter is associated with sleep instability. A special property of LFC, the so-called increased LFC, can be used to detect periods of apnea and hypopnea.

Correspondence to: Laura Alia, Department of Family Medicine and Public Health, University of California, Los Angeles, USA, E-mail: laura.alia@ucsd.edu

Received: 01-Jul-2022; Manuscript No. JSDT-22-18570; **Editor assigned:** 04-Jul-2022; Pre QC No. JSDT-22-18570 (PQ); **Reviewed:** 18-Jul-2022; QC No. JSDT-22-18570; **Revised:** 25-Jul-2022; Manuscript No. JSDT-22-18570 (R); **Published:** 01-Aug-2022, DOI: 10.35248/2167-0277.22.11.374.

Citation: Alia L (2022) Diagnosis of Sleep Apnea by using Different Parameters. J Sleep Disord Ther. 11:374.