

Young Woman With Sleep Disordered Breathing in the Intensive Care Unit: A Case Report “Correct Diagnosis with PSG for sleep disordered breathing and epilepsy” “For neurologists, pulmonologists, anesthesiologists”

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ABSTRACT The objective of this case report is to propose an approach to sleep-disordered breathing in the intensive care unit (ICU) for clinicians and emergency medical doctors, especially neurologists, pulmonologists, anesthesiologists. 35-year old, female, obese (BMI: 39 kg/m²) and the paraplegic patient had been admitted to the Neurology Clinic 2 years ago with the complaints of apnea during day and night time, and contractions. The neurologist treated her with valproic acid. 2 years after the initiation of treatment, the patient was admitted to the emergency ward and then to ICU due to respiratory arrest. Polysomnography showed us the existence of very severe obstructive sleep apnea syndrome. Differential diagnosis of sleep-disordered breathing and epilepsy have been difficult for clinicians.

KEYWORDS Sleep Disordered Breathing, Epilepsy, Definitive diagnosis, PSG

Introduction

The objective of this case report is to propose an approach to sleep-disordered breathing in the intensive care unit (ICU) for clinicians and emergency medical doctors, especially neurologists, pulmonologists, anesthesiologists. Most patients with sleep-disordered breathing are not correctly diagnosed or treated. Accordingly, it is not uncommon for a patient to have this disease recognized for the first time while in the ICU. If we were to take a look at sleep physiology, we would see that sleep is a reversible activity performed during the night. Throughout the night, with intervals of 90-120 minutes REM (Rapid Eye Movement; dream stage) sleep follows NREM sleep (Non-Rapid Eye Movement; deep sleep stage) constituting an essential process

in human life. Obstructive Sleep Apnea Syndrome (OSAS) is the most important presentation of sleep-disordered breathings leading to sleep deprivation; it is a complex clinical condition where the passage of air through the upper airways either totally stops (apnea) or decreases (hypopnea) for 10 seconds or longer having detrimental consequences on all organs and systems but mainly on the brain and the heart. Polysomnography (PSG) is the golden standard for the diagnosis of OSAS [1,2,3]. Seizures appear due to limited abnormal electrical discharges namely epileptogenic foci, and it can have focal and generalized forms. These seizures can be diagnosed with an electroencephalogram (EEG) during sleep. However, there is an objective bidirectional relationship between OSAS and epilepsy. The guidance mechanisms of the deleterious effect of OSAS on epilepsy include sleep deprivation, sleep fragmentation, decreased cardiac output, cardiac arrhythmias, autonomic instability, increases in sympathetic activity and cerebral hypoxemia. Prior studies have shown abnormal sleep architecture in people with epilepsy. These abnormalities include declined total sleep and REM sleep time, prolonged REM latency, and also an extended number of arousals. As a result of these abnormalities have caused free of seizures [4,5].

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Case (History)

35-year old, female, obese (BMI: 39 kg/m²) and paraplegic (due to post-polio syndrome) patient had been admitted to the Neurology Clinic 2 years ago with the complaints of apnea during day and night time, and contractions. The neurologist treated her with valproic acid. 2 years after the initiation of treatment, the patient was admitted to the emergency ward and then to ICU due to respiratory arrest. Due to desaturation at night, she was consulted to pulmonology and then to the Sleep Disorder Center. Polysomnography showed us the existence of very severe obstructive sleep apnea syndrome (Apnea-Hypopnea Index: 106,8). After the resolution of atelectasis, which had occurred in ICU, the patient was given CPAP therapy (10 cmH₂O) and oxygen saturation of the patient normalized.

Discussion

OSAS is independently related to metabolic syndrome, hypertension, insulin resistance, impaired glucose tolerance and dyslipidemia that all carry cardiovascular risks. The treatment of individuals with similar conditions who do not have OSAS are managed at ICUs, and that is why a diagnosis of OSAS might not be considered while in ICU. OSAS does decrease respiratory drive and may worsen respiratory failure from another cause. Also, cardiac arrhythmias or profound hypoxemia may be seen while patients are monitored in the critical care unit during sleep. The occurrence of seizures can further aggravate abnormal sleep architecture [1-6]. Epilepsy may have a more direct effect on OSAS in some patients as promoted by a case report demonstrating the resolution of clinically significant OSAS after frontal lobe resection. There is also evidence that adults with temporal lobe epilepsy are more affected by abnormal sleep architecture compared to patients with frontal lobe epilepsy or generalized epilepsy [7-9]. This effect of epilepsy on sleep architecture is potentially aggravated by selection of antiepileptic drugs or neuromodulation therapy. In our case study; frontal lobe epilepsy was considered and treatment was started and continued by a neurologist for two years with valproic acid. Treating epilepsy patients with sedating agents such as benzodiazepines can reduce their upper airway muscle tone; other medications such as valproic acid can cause weight gain that might worsen OSAS [8-11].

Differential diagnosis of sleep-disordered breathing and epilepsy have been difficult for clinicians. In our patient for example, apnea episodes during night time had been mistaken for seizures. Furthermore, antiepileptic medication has contributed to weight gain. As a result of unrecognized apnea episodes both at home and at the hospital, the patient had to be admitted to ICU. Therefore, it is of extreme importance to definitively diagnose patients who have seizures or apnea episodes.

Abbreviations:

AHI (apnea-hypopnea index), BMI (body mass index), EEG (electroencephalogram), ICU (intensive care unit), NREM sleep (Non Rapid Eye Movement), OSAS (obstructive sleep apnea syndrome), PSG (polysomnography), REM (Rapid Eye Movement), VNS (vagal nerve stimulators).

Conflict of interest

The authors declare no conflict of interest.

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