

# The Relationship Between Sleep Apnea Syndrome and Epilepsy

## Uyku Apne Sendromu Epilepsi İlişkisi

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A 28-year-old male patient was referred to our outpatient clinic for sleep disorders with the complaints of snoring, witnessed apnea, and epileptic seizures while asleep approximately once a month, including the night before he presented. His medical history included current use of 3 antiepileptic drugs. He had no smoking or alcohol consumption habits. Body mass index was 31.1 kg/m<sup>2</sup> and Epworth Sleepiness Score was 7. A polysomnography (PSG) examination revealed 81% sleep activity and a sleep latency of 48 minutes. The distribution of sleep stages of rapid eye movement (REM), and non-REM stage 1, stage 2, and stage 3 was 17.9%, 7.6%, 47.5%, and 27%, respectively. During sleep in the supine position, intermittent and moderate snoring was recorded. In all, 50 counts of respiratory symptoms were observed during sleep: 15 were obstructive apnea, 9 were central apnea, and 26 were hypopnea. The apnea-hypopnea index (AHI) measurement was 8.1. The longest apnea duration was 17.5 seconds, the mean oxygen saturation during the night was 94%, and the minimum oxygen saturation was 89%. It was observed that respiratory symptoms increased in the supine position (AHI<sub>supine</sub>: 9.6, AHI<sub>leftside</sub>: 4.8). The sleep data recorded during the PSG and titration are listed in Table 1. No pathological finding was detected during an endoscopic examination of the patient's upper respiratory airways and all of the respiratory symptoms were eliminated with positive airway pressure (PAP) titration. An automatic PAP device was prescribed. A hypnogram of the PSG is shown in Figure 1a and the pressure change graphics of the titration can be seen in Figure 1b. During follow-up care over the next 2 years, triple epi-

lepsy treatment (Depakine [Sanofi-Aventis, Paris, France], Topomax [Janssen Pharmaceutica NV, Beerse, Belgium], Tegretol [Novartis Pharmaceuticals Corp., Basel, Switzerland]) was switched to monotherapy, the seizure interval dropped to once every 6 months, and the PAP treatment was continued. This case was reported in order to draw attention to the co-occurrence of epilepsy and sleep apnea syndrome and to the improvement in epilepsy symptoms achieved with sleep apnea treatment.

As the activity of inhibitory mechanisms is diminished during sleep, cortical stimulability increases and the emergence of epileptic seizures is facilitated. Seizures were encountered particularly in NREM stage 1 and stage 2. The presence of an underlying sleep disorder, which causes a decrease in cerebral blood flow, hypoxemia, and sleep deprivation, can increase the incidence and severity of seizures in epileptic patients.<sup>[1]</sup> In a study, PSG examination of epileptic patients displayed that 71% of patients had obstructive apnea syndrome.<sup>[2]</sup> It was demonstrated that obstructive sleep apnea syndrome was common in patients with drug-resistant epilepsy. Studies conducted on rats with resistant epilepsy (generated with lindane) have confirmed that sleep disorders increased the number of seizures.<sup>[3]</sup> A seizure that cannot be controlled with 2 or more antiepileptic agents administered in optimal doses is called drug-resistant epilepsy.<sup>[4]</sup> As our patient was on triple antiepileptic medication, he met the diagnostic criteria of drug-resistant epilepsy. A meta-analysis reported that obstructive sleep apnea syndrome was relatively common in

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**Table 1.** Sleep data of the polysomnography and titration night

	Polysomnography	Titration
Total sleep time (min)	441	448
Sleep efficiency (%)	81	92
REM (min)*/(%)	78.9 / 17.9	81 / 18
NonREM Stage 1 (min)* / (%)	33.5 / 7.6	18 / 4
NonREM Stage 2 (min)* / (%)	209.4 / 47.5	236 / 52.6
NonREM Stage 3 (min)* / (%)	119 / 27	113 / 25.2
AHI	8.1	0
AHISUPINE	9.6	0
AHILEFT-RIGHTSIDE	4.8-2.3	0
Obstructive sleep apnea count	15	0
Central sleep apnea count	9	0
Hypopnea count	26	0
Mean oxygen saturation	94	94
Minimum oxygen saturation	89	93
Longest period of apnea (s)	17.5	1.2

\*Sleep stages are presented in minutes and as a percentage of total sleep time. AHI: Apnea-hypopnea index; REM: Rapid eye movement.

epilepsy patients and a suitable treatment led to a decrease in seizure incidence.<sup>[5]</sup> Epilepsy and antiepileptic agents change sleep architecture, prolong sleep latency, and cause frequent awakenings and diurnation.

In our patient, we established significant control of the seizures and treated drug-resistant epilepsy. We conclude that epilepsy patients should be assessed regarding a regular sleep pattern and sleep-related respiratory disorders and should be treated accordingly.

#### Conflict of Interest

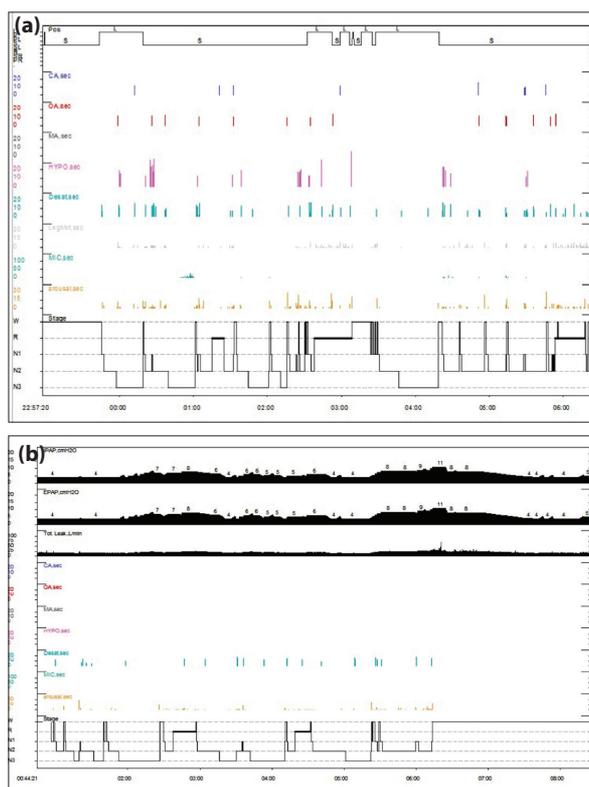
None declared.

#### Peer-review

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#### Authorship Contributions

Concept: A.C.P., H.I.K., F.I.; Design: A.C.P., H.I.K., F.I.; Data collection &/or processing: A.C.P., H.I.K., F.I.; Analysis and/or interpretation: H.I.K.; Literature search: F.I.; Writing: A.C.P., F.I.; Critical review: H.I.K.



**Fig. 1.** (a) Hypnogram of the polysomnography. (b) Pressure change graphics of titration.

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