The patient was a 49-year-old man with no significant past medical history, normal body mass index, and normal oral/nasal airway anatomy, who presented with a 4-month history of episodic loss of consciousness while working as a cemetery caretaker. The patient lost consciousness while using a riding lawnmower at the cemetery during his morning landscaping duties; this caused him to lean forward in his seat. The riding lawnmower would then hit a headstone, and the jarring impact caused him to “come to.” He experienced these episodes approximately 10 to 20 times a month. The patient denied associated jerking, posturing, or staring with these episodes. Prior to our evaluation, the patient was evaluated by an internist and found to have normal serum metabolite levels, complete blood count, and electrocardiogram.

The patient had two daily jobs. He worked as a cemetery caretaker from 06:00 to 14:30. His second job was as a bank janitor from 17:30 to 20:30. He returned home by 21:30 and went to bed at 22:30. Before going to bed, the patient watched television or used his personal computer to go onto the internet. Once in bed, his ability to get to sleep was often disrupted by noisy neighbors. This environmental disturbance made it difficult to get into stable sleep most nights. A typical week’s sleep log is shown in Fig. 1.

He denied witnessed snoring or apneas, leg jerking or cramping, lower extremity dysesthesias, cataplexy, sleep paralysis, and hypnagogic/hypnopompic hallucinations. The patient reported excessive daytime sleepiness and would fall asleep while sitting quietly or watching television. The patient drank approximately six 12-ounce cans of caffeinated soda per day, but none after 18:00. He took a refreshing 20-minute nap during his lunch break. On the weekends, he attempted to catch up on his sleep by sleeping later and taking naps during the day.

What is the diagnosis?
Behaviorally induced insufficient sleep syndrome, presenting with sleep attacks

DISCUSSION

Behaviorally induced insufficient sleep syndrome (ISS) is due to chronic sleep deprivation. Although its voluntary nature clearly differentiates it from the other disorders classified under *hypersomnias of central origin* in the second edition of the *International Classification of Sleep Disorders (ICSD-2)*, the consequences of insufficient sleep do involve CNS mechanisms. The abnormal sleep pattern must be almost daily for over 3 months. Individuals may complain of difficulty with attention and concentration, irritability, fatigue, and other physiologic responses to reduced sleep. Additional complaints associated with insufficient sleep in the *ICSD-2* include sleep paralysis (i.e., the inability to move for a few minutes after waking up) and hypnagogic hallucinations. Our patient’s physiologic response to reduced sleep was to experience sleep attacks in the morning hours, which were initially thought to be complex partial seizures, cardiogenic syncope, or malingering.

The insufficient sleep in behaviorally induced ISS is a consequence of volitional choices, social pressures, sleep environment, pre-sleep activities, and work-related factors. Resulting lack of sleep can lead to serious injury on the job or while driving, as in our patient. Patients may describe “catching up” with prolonged sleep periods on weekends or vacation. A detailed sleep history reveals a disparity between the patient’s need for sleep and the amount of sleep obtained. The significance of this disparity is often unappreciated by the patient.

ISS is common in adolescents and young adults; it must be distinguished from delayed sleep phase syndrome, which is also common in this age group. Delayed sleep phase syndrome is a delay in sleep time resulting in inability to fall asleep and to wake up at desired clock times. Our patient did not suffer from this and was able to easily adjust his sleep schedule when the underlying problem was brought to his attention. Patients often self-treat daytime sleepiness with caffeine and other stimulants. An American Academy of Sleep Medicine task force review recommended only limited use of these substances for the syndrome. Instead of chronic caffeine use, patients should be strongly encouraged to increase time in bed.

Laboratory testing is usually unnecessary; if performed, diagnostic polysomnography typically shows reduced sleep latency and increased sleep efficiency on polysomnography, and short sleep latency on multiple sleep latency test (MSLT) with < 2 sleep onset REM episodes (SOREMs). A successful therapeutic trial of longer sleep episodes supports the diagnosis of behaviorally induced insufficient sleep syndrome.

**CLINICAL PEARLS:**

1. Behaviorally induced insufficient sleep syndrome is due to chronic sleep deprivation and may result in difficulty with attention/concentration, irritability, fatigue, sleep paralysis, hypnagogic hallucinations, and other physiologic responses to reduced sleep—including sleep attacks.
2. The insufficient sleep in this syndrome is secondary to volitional choices, social pressures, sleep environment, pre-sleep activities, and work-related factors.
3. A detailed sleep history reveals a disparity between the patient’s need for sleep and the amount of sleep obtained. The significance of this disparity is often unappreciated by the patient.
4. Laboratory testing is usually unnecessary; if performed, diagnostic polysomnography typically shows reduced sleep latency and increased sleep efficiency on polysomnography, and short sleep latency on multiple sleep latency test (MSLT) with < 2 sleep onset REM episodes (SOREMs). A successful therapeutic trial of longer sleep episodes supports the diagnosis of behaviorally induced insufficient sleep syndrome.

**DISCLOSURE STATEMENT**

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**REFERENCES**