Dangerous Driver

Klark B. Turpen, M.D.¹; Mary H. Wagner, M.D., F.A.A.S.M.²¹Department of Medicine, University of Florida Pulmonary, Critical Care, and Sleep Medicine;²Department of Pediatrics, University of Florida Pulmonary and Sleep Medicine

A 16-year-old white male presents for evaluation of daytime sleepiness. He fell asleep while driving and ran off the road. He does not remember being sleepy before the event and was able to continue driving. The patient denies falling asleep during school, although mom has received reports otherwise. His grades are excellent. He goes to bed at midnight on weeknights, falls asleep within 30 minutes, and arises with difficulty at 6:30 am. On weekends he sleeps from 2 am to noon with a 10-minute sleep

latency. He denies leg restlessness, cataplexy, hypnagogic hallucinations, or sleep paralysis. He consumes 2-3 caffeinated beverages per day. He has no history of serious illness or trauma. A sleep diary was obtained (**Figure 1**). PSG and MSLT were performed (**Tables 1 and 2**).

QUESTION:

Does this patient have narcolepsy?

Figure 1—2 week sleep diary

Name: Patient R DOB: / / Health professional: Unit #:
 Date started: / / Comments:
 List medications: Flonase, Amoxicillin, Allegra

Midnight													Noon													Comments
Day	6p	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5		
Mon							↓																			Mt Dew x 2
Tues							↓																			Coke + Dr. Pepper
Wed							↓																			
Thur							↓																			Mt Dew
Fri							↓																			
Sat																										
Sun							↓																			
Mon							↓																			Mt Dew + Coke
Tues							↓																			Dr. Pepper + Tea
Wed							↓																			
Thur							↓																			Sweet tea x 2
Fri							↓																			Mt Dew
Sat																										
Sun							↓																			

Day	6p	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	Comments
Ex.																									

Key: ↑=out of bed ↓=in bed Filled in=asleep

Figure 2—Hypnogram demonstrating decreased TST with prolonged sleep latency and increased WASO **Table 1**—Diagnostic polysomnogram summary**Sleep Architecture**

Lights Out	10:29 pm
Total Sleep Time	291.0 min
Sleep Efficiency	64.0%
Sleep Latency	45.0 min
REM Latency	202.5 min

Sleep Stages **% of TST**

Stage N1/N2	63.2
Stage N3	22.5
Stage R	14.3

AHI 1.2**PLMI** 0**Table 2**—Results of the multiple sleep latency test

	Sleep Latency, min	REM
Nap 1	8.0	Yes
Nap 2	2.5	Yes
Nap 3	3.5	Yes
Nap 4	10.5	Yes
Nap 5	13	No

Mean Sleep Onset Latency = 7.5 min; SOREMPs = 4.

ANSWER:

The diagnosis of narcolepsy cannot be made in this patient although the findings of the MSLT meet some of the ICSD-2 criteria for narcolepsy.¹ Although the patient has daytime sleepiness, a mean sleep latency < 8 minutes, and 4 SOREMPs, the overnight sleep time was insufficient, being less than 6 hours.

DISCUSSION

The diagnosis of narcolepsy cannot be made with confidence in this situation. This patient had insufficient sleep prior to the MSLT, with a decreased sleep efficiency of 64% and a TST of 4.85 hours. The decreased sleep efficiency and decreased REM could account for the shortened sleep latency and 4 SOREMPs noted during the MSLT.

The patient was counseled to improve his sleep hygiene, given a short-acting benzodiazepine receptor agonist to improve sleep onset, counseled to move his sleep onset time gradually from midnight to 10:30 pm, and instructed not to drive until sleeping at least 8 hours per night.

Narcolepsy cannot be excluded, but the diagnosis cannot be made until his sleep duration is consistently longer. The onset of narcolepsy is typically in the second decade, with patients ages 15 to 25 years of age reporting symptoms.² The prevalence in adults in the US is estimated at 20 per 100,000.² However, daytime sleepiness due to insufficient sleep is more common. National Sleep Foundation "Sleep in America Poll" in 2006 revealed adolescents averaged 7.6 h of sleep, decreasing across the age group, with 12th graders averaging 6.9 h/night. Seventy-eight percent of adolescents felt they needed 8 hours of sleep, and 51% reported getting this much sleep. Twenty-eight percent of high school adolescents reported falling asleep in school or while doing homework; and 15% of driving 10th to 12th grade adolescents reported driving while drowsy at least once a week in the previous year. Five percent of those feeling drowsy reported falling asleep while driving. Thus, sufficient sleep is an important issue in this age group.

PEARLS

1. The 2005 AASM Practice Parameters³ state at least 6 hours of sleep must be recorded during the preceding PSG for the MSLT findings to be reliable.

2. Circadian rhythm sleep phase delay can make interpretation of the MSLT problematic, as the SOREMPs observed could be secondary to the phase delay with REM sleep pressure from the night prior.
3. Insufficient sleep is a common cause of excessive daytime sleepiness and can lead to a false positive MSLT for diagnosis of narcolepsy. A sleep log for 2 weeks prior to the MSLT to assess sleep-wake schedule should be obtained.
4. Adult criteria of a mean sleep latency $\leq$ 8 minutes for a diagnosis of narcolepsy in adults may not identify children with narcolepsy. There is limited normative MSLT data for these age groups. Carskadon and coworkers^{4,5} report the sleep latency of children and preadolescents appears to be significantly longer than adolescents.

REFERENCES

1. American Academy of Sleep Medicine: ICSD-2 International Classification of Sleep Disorders, 2nd ed. Diagnostic and Coding Manual. Westchester, IL: American Academy of Sleep Medicine, 2005.
2. The National Sleep Foundation 2006 Sleep in America Poll: http://www.sleepfoundation.org/sites/default/files/2006_summary_of_findings.pdf
3. Litner MR, Kushida C, Wise M, et al. Standards of Practice Committee of the American Academy of Sleep Medicine. Practice parameters for the clinical use of the multiple sleep latency test and the maintenance of wakefulness test. *Sleep* 2005;28:14-5.
4. Carskadon M. The second decade. In: Guleminault C. Sleeping and waking disorders- indications and techniques. Boston: Butterworth, 1982: 99-125.
5. Carskadon MA, Wolfson AR, Acebo C, Tzischinsky O, Seifer R. Adolescent sleep patterns, circadian timing, and sleepiness at a transition to early school days. *Sleep* 1998;21:871-81.

ACKNOWLEDGMENTS

This pearl was formulated from a clinical case that presented and was evaluated in the pediatric sleep clinic at the University of Florida.

SUBMISSION & CORRESPONDENCE INFORMATION

Submitted for publication April, 2011

Submitted in final revised form April, 2011

Accepted for publication April, 2011

Address correspondence to: Klark Turpen, 1756 SW 65th Drive, Gainesville, FL 32607; Tel: (502) 387-9630; Fax: (352) 392-0821; E-mail: klark_bennett21@hotmail.com

DISCLOSURE STATEMENT

This was not an industry supported study. The authors have indicated no financial conflicts of interest.