A 64-year-old stationery engraver presented with several months of twitching of his fingers and face occurring predominantly during sleep. The twitches would occur asymmetrically and were not associated with any gross motor activity. He could identify no precipitating factors preceding the development of his muscle twitches. His wife reported a history of snoring; however, the patient denied morning headaches or dry mouth. There were no symptoms of daytime sleepiness (Epworth Sleepiness Scale score was 4), restless legs syndrome, sleep-related limb movements, or dream enactment.

Polysomnography (PSG) demonstrated frequent short bursts of muscle activity throughout wakefulness, NREM, and REM sleep in both upper and lower extremity EMG leads, which were unassociated with arousals or breathing events (Figure 1). PSG was otherwise essentially normal, with an apnea-hypopnea index of 2 per hour, respiratory disturbance index of 4 per hour, and periodic limb movement index of 4 per hour. Our laboratory utilizes yoked anterior tibialis recording technique, and maintains all electrode impedances below 5 kΩ.

**SLEEP MEDICINE PEARLS**

**A 62-year-old Man with Facial and Finger Twitching**

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**QUESTION:** What is the polysomnographic finding shown in Figure 1?

A. REM sleep without atonia

B. Periodic limb movements of sleep

C. Alternating leg muscle activation during sleep

D. Excessive fragmentary myoclonus
Figure 1—Excessive muscle activity during Wake and NREM sleep.

There were brief bursts of muscle activity (most having measured duration under 150 msec) throughout NREM and REM sleep, as well as less during wakefulness, without clinical accompaniment. These EMG bursts are distinguished from the ECG QRS signal artifact, which is prominent in yoked anterior tibialis recording techniques.
ANSWER: D. Excessive fragmentary myoclonus

DISCUSSION

Excessive fragmentary myoclonus (EFM) is most commonly an incidental finding during PSG. Large prospective and retrospective studies have shown EFM to be present in a variable proportion of healthy controls (from 0% to 100%), although EFM has been described in a variety of different patient populations including Machado-Joseph disease, narcolepsy, and other sleep disturbances.1–4 EFM has been associated with increasing age, male gender, and lower oxyhemoglobin saturation levels, with highest frequency of EFM occurring during REM sleep.5 EFM is either asymptomatic without visible muscle movements, or when rarely symptomatic as in our patient, involves minor asynchronous and asymmetrical twitching of the fingers, toes, or corners of the mouth, without movement across a joint space. No treatment is necessary, but when EFM symptoms disturb sleep quality, carbamazepine has been reportedly effective.5 Since EFM is invariably a benign finding of limited clinical significance, it must be differentiated from REM sleep without atonia (RSWA), the electrophysiologic substrate of REM sleep behavior disorder. EFM bursts are usually < 150 msec in duration and occur at least 5 times per minute throughout 20 minutes in overall duration throughout wake and NREM as well as REM sleep stages, whereas RSWA transient/phasic muscle activity bursts are usually significantly > 150 msec (approximately 500 msec in sleep apnea patients and 1.1 seconds in RBD patients) and are confined to REM sleep stage (although frequent NREM periodic limb movements are often seen in RBD patients). However, AASM scoring standards hold that EFM burst duration may also be longer than 150 msec when visible twitching is present,6 and variability in the frequency of EFM identification in various normative cohorts may result from variable electrode impedance during recording.5 Maintaining electrode impedances below 5 kΩ during polysomnography recording is recommended by the AASM,7 and maintaining electrode impedances below 10 kΩ has been suggested to minimize artifacts that may be confused with EFM.8 ECG QRS signal artifact is prominent in our samples above given yoked anterior tibialis recording technique, which leads to prominent ECG artifact, despite adequate electrode impedances due to differential amplification of the opposite cardiac polarity between the left and right legs, together with relatively long interelectrode distances.9 Also, RSWA often corresponds to grossly visible limb movements, whereas EFM shows either no visible movements or limited facial muscle or finger twitches on video PSG review. Hypnic jerks may also be considered in patients with EFM; however, hypnic jerks most often occur synchronously at sleep onset and do not occur during all sleep stages.10

Our patient was reassured about the benign nature of EFM, and no further treatment was necessary in his case.

SLEEP MEDICINE PEARLS

1. EFM is primarily an incidental finding on PSG without clinical significance.
2. Rarely, EFM may be symptomatic requiring patient reassurance.
3. EFM must be distinguished from RSWA, the neurophysiologic substrate of REM sleep behavior disorder.

ABBREVIATIONS

EFM, excessive fragmentary myoclonus
EMG, electromyogram
PSG, polysomnography
RSWA, REM sleep without atonia

CITATION


REFERENCES


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