

증례를 통해 알아보는 수면 질환 (2): 기면증, 사건 수면 및 수면 중 운동장애



송파멜라

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Learning Objectives

Learn classification of sleep disorders

Review case of Narcolepsy

Review cases of Parasomnia

Review cases of Sleep Related Movement Disorders

To learn remarkable features of each sleep disorders

ICSD-3 classification (International Classification of Sleep Disorders)

Insomnia

Sleep Related Breathing Disorders

Central Disorders of Hypersomnolence

Circadian Rhythm Sleep-Wake Disorders

Parasomnias

Sleep Related Movement Disorders

Other Sleep Disorder

ICSD-3 classification (International Classification of Sleep Disorders)

Insomnia

Sleep Related Breathing Disorders

Central Disorders of Hypersomnolence

Narcolepsy Type 1

Narcolepsy Type 2

Circadian Rhythm Sleep-Wake Disorders

Parasomnias

Sleep Related Movement Disorders

Other Sleep Disorder

ICSD-3 classification (International Classification of Sleep Disorders)

Insomnia

Sleep Related Breathing Disorders

Central Disorders of Hypersomnolence

Circadian Rhythm Sleep-Wake Disorders

Parasomnias

NREM-related Parasomnias

Confusional Arousals

Sleepwalking

Sleep Terrors

Sleep Related Eating Disorder

REM-related Parasomnias

REM Sleep Behavior Disorder

Recurrent Isolated Sleep Paralysis

Nightmare disorder

Sleep Related Movement Disorders

Other Sleep Disorder

ICSD-3 classification (International Classification of Sleep Disorders)

Insomnia

Sleep Related Breathing Disorders

Central Disorders of Hypersomnolence

Circadian Rhythm Sleep-Wake Disorders

Parasomnias

Sleep Related Movement Disorders

Restless Legs Syndrome

Periodic Limb Movement Disorder

Sleep Related Leg Cramps

Sleep Related Bruxism

Sleep related Rhythmic Movement Disorder

Other Sleep Disorder

Case – 1**F/33**

2001 년 부터 주간 졸림증이 심하여 수면검사를 시행함.

낮에 졸림증으로 5분 ~ 30분 정도 낮잠을 자면

이후 1-2시간 정도 깨어 있다.

최근 운전 중 신호대기에서 계속 깜박깜박 졸게 되었다.

In bed: 23:00

Sleep Latency: 1 min

Awake: 09:00

Cataplexy: (+) 웃을 때 물건을 놓치기도 한다.

한국형 주간졸음척도 (KESS)				
단순한 피곤함과 다르게 다음의 상황에서 얼마나 깜박 졸거나 혹은 잠들어버릴 것 같습니까? 이것은 최근에 일상생활을 참고하시기 바랍니다. 비록 최근에 이런 상황에 처하지 않았다 하더라도, 그 상황에서 얼마나 영향을 받을지 생각해 보십시오. 각 상황에서 가장 적절한 숫자를 선택하여 한 개씩만 표시하시기 바랍니다.	깜박 졸 가능성			
	전혀 0	조금 1	상당히 2	매우 많 이 3
앉아서 책 (신문, 잡지, 서류 등)을 읽을 때				3
TV 볼 때				3
공공장소 (모임, 극장 등)에서 가만히 앉아 있을 때				3
정차 없이 1시간 동안 운행 중인 차 (자동차, 버스, 열차)에 승객으로 앉아 있을 때				3
오후에 주위상황이 허락되어 쉬려고 누워 있을 때				3
앉아서 상대방과 이야기할 때				3
반주를 곁들이지 않은 점심식사 후 조용히 앉아 있을 때				3
교통 혼잡으로 몇 분 동안 멈춰선 차 안에서			2	
>10 is considered indicative of excessive daytime sleepiness				
>15 is common in untreated narcolepsy patients				
Johns, 1994, Cho, sleep breath 2014				

Ullanlinna Narcolepsy Scale

Ullanlinna Narcolepsy Scale

1. When laughing, becoming glad or angry or in an exciting situation, have the following symptoms suddenly occurred?

	Never	1-5 times during Lifetime	Monthly	Weekly	Daily or Almost Daily
Knees Unlocking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mouth Opening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Head Nodding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Falling Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How fast do you usually fall asleep in the evening?

>40 min 31-40 min 21-30 min 10-20 min <10 min

3. Do you sleep during the day (take naps)?

☐ No need ☐ I wanted but cannot sleep ☐ Twice weekly or less
☐ On 3-5 days weekly ☐ Daily or almost daily

4. Do you fall asleep unintentionally during the day?

	Never	Monthly or less	Weekly	Daily	Several times Daily
Situation					
Reading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Travelling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Unusual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Scale ranging : 0 to 4

Total scores : 0 to 44

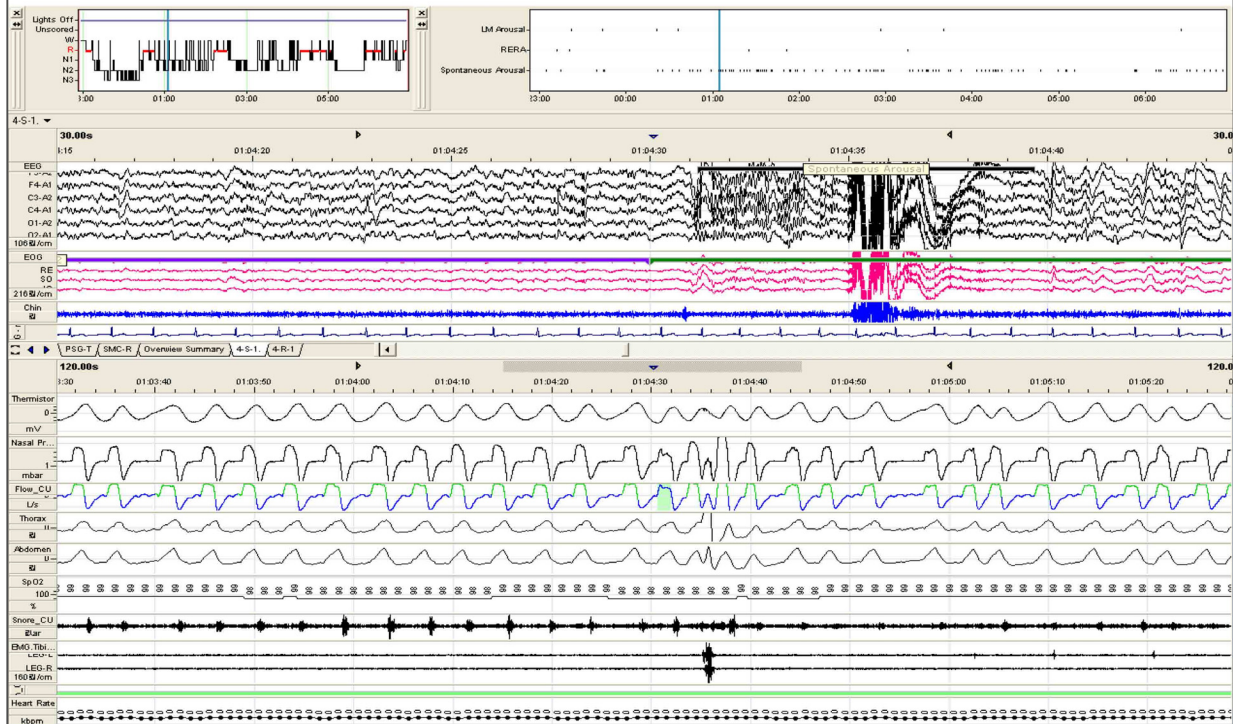
Higher score

: narcoleptic tendencies

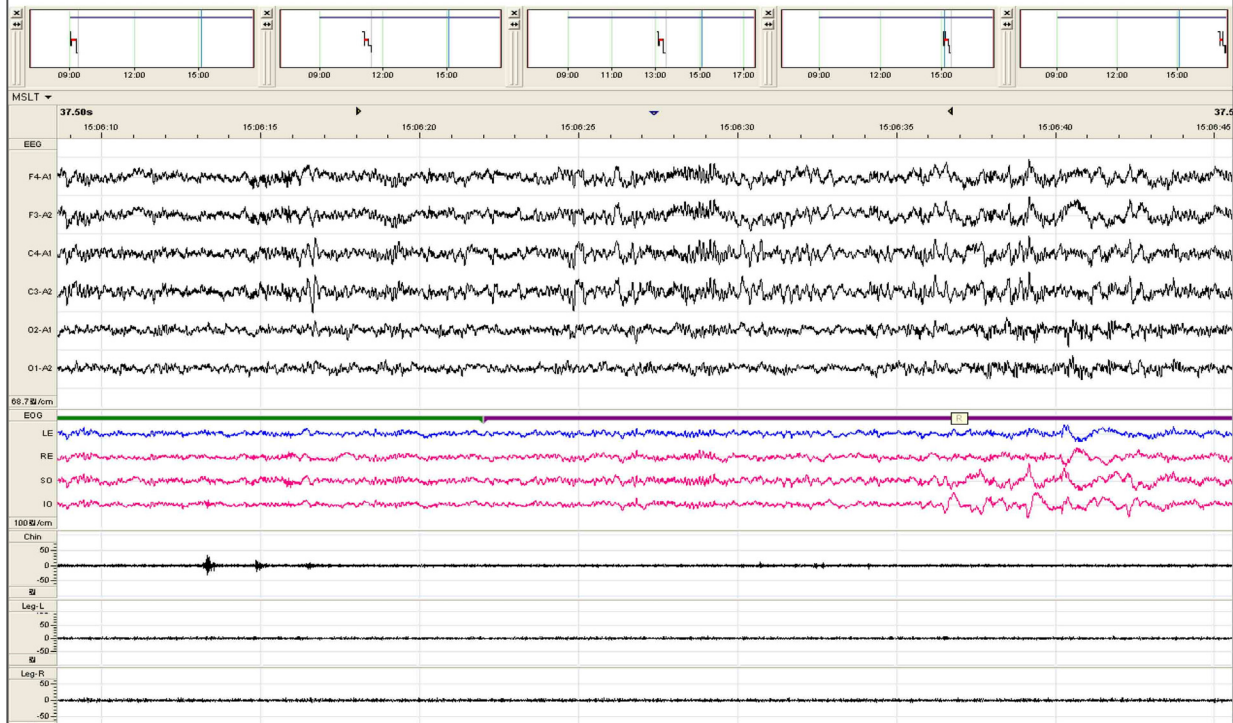
: cutoff 14 have high sensitivity and specificity for narcolepsy

Hublin et al.

Spontaneous arousal



MSLT (mean sleep latency: 3 min , SOREM 5회, mean REM latency 54 sec)



Daytime naps	ESS	Sleep latency	REM latency	Sleep stage
1st trial	23	1 min	1 min 30 sec	N1, 2, R
2nd trial	-	4 min	1 min	N1, 2, R
3rd trial	-	3 min	1 min	N1, 2, R
4th trial	-	2 min	30sec	N1, 2, R
5th trial	-	5 min	30sec	N1, 2, R
Mean sleep latency		3 min		
Number of sleep-onset REM (SOREM)		5		
Mean REM sleep latency		54 sec		

ICSD – 3 Diagnostic Criteria Narcolepsy Type 1



Criteria A and B must be met

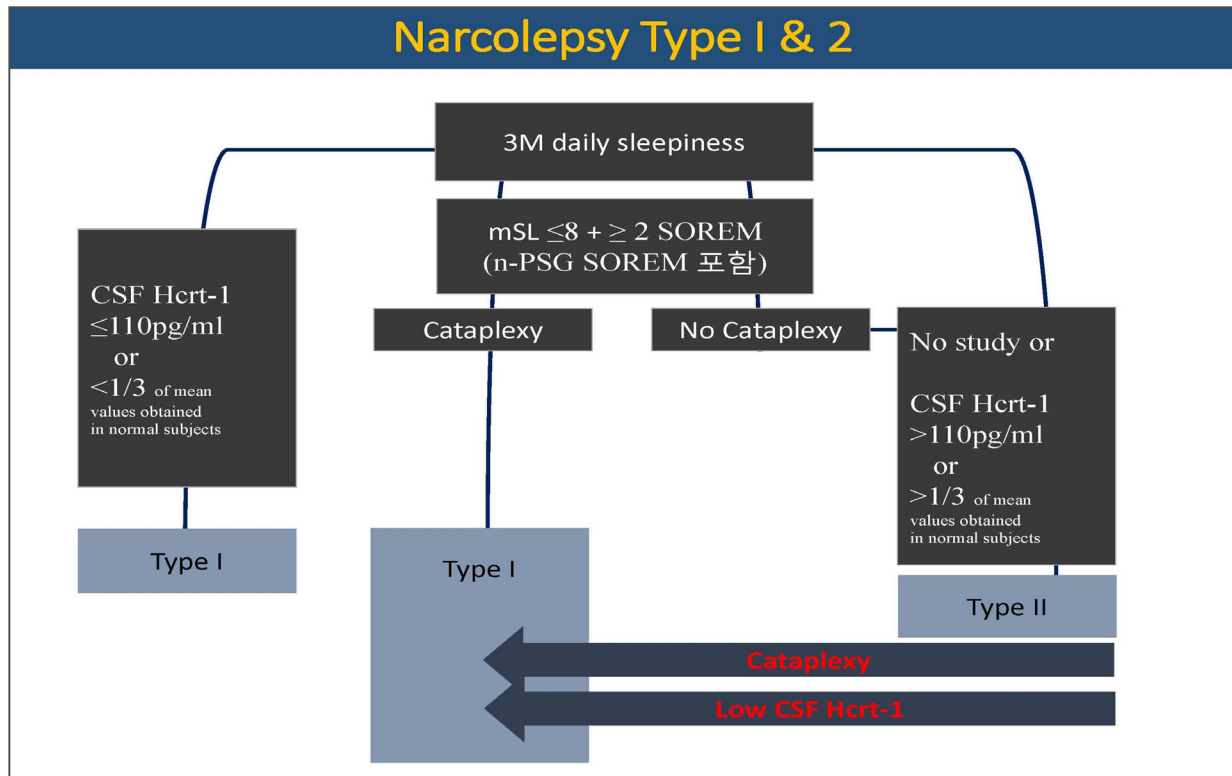
- A. The patient has daily periods of irrepressible need to sleep or daytime lapses into sleep occurring for at least three months**
- B. The presence of **one or both** of the following:**
 - 1. Cataplexy (as defined under Essential Features)**
and a mean sleep latency of ≤ 8 minutes
and 2 or more sleep onset REM periods (SOREMP) on a MSLT
performed according to standard techniques.
A SOREMP (within 15 minutes of sleep onset) on the preceding nocturnal polysomnogram may replace one of the SOREMPs on the MSLT
 - 2. CSF hypocretin-1 concentrations measured by immunoreactivity**
either $\leq 110\text{pg/ml}$ or $< 1/3$ of mean values obtained in normal subjects with the same assay.
- 1. In young children, narcolepsy may sometimes present as excessively long night sleep or as resumption of previously discontinued daytime napping.
- 2. If narcolepsy type I is strongly suspected clinically but the MSLT criteria of B1 are not met, a possible strategy is to repeat the MSLT.

ICSD – 3 Diagnostic Criteria Narcolepsy Type 2



Criteria A and B must be met

- A. The patient has daily periods of irrepressible need to sleep or daytime lapses into sleep occurring for at least three months**
- B. A mean sleep latency of ≤ 8 minutes and 2 or more sleep onset REM periods (SOREMP) on a MSLT performed according to standard techniques. A SOREMP (within 15 minutes of sleep onset) on the preceding nocturnal polysomnogram may replace one of the SOREMPs on the MSLT**
- C. Cataplexy is absent.**
- D. Either CSF hypocretin-1 concentration has not been measured**
or CSF hypocretin-1 concentration measured by immunoreactivity is
either $> 110\text{ pg/mL}$ or $> 1/3$ of mean values obtained in normal subjects with the same assay
- E. The hypersomnolence and/or MSLT findings are not better explained by other causes such as insufficient sleep, obstructive sleep apnea, delayed sleep phase disorder, or the effect of medication or substances or their withdrawal.**
- 1. If cataplexy develops later, then the disorder should be reclassified as narcolepsy type 1.
- 2. If the CSF Hcrt-1 concentration is tested at a later stage and found to be either $\leq 110\text{ pg/mL}$ or $< 1/3$ of mean values obtained in normal subjects with the same assay, then the disorder should be reclassified as narcolepsy type 1.



Case – 2

M/7

1년 전부터 수면 중 자주 깬다고 함.

엄마가 옆에 지켜보면, 잠에서 깨고 두리번 거리다가 다시 잔다.

웅얼거리기도, 잠자리를 바꾸면서 다시 잠들기도 한다고 하였다.

별 걱정 없이 지켜보았다고 함

2달 전 자다가 깨서 눈을 반쯤 뜨고 걸어 다니다가

옆에 엄마에게 “같이 나가자고” 웅얼거리는 듯 말을 하고

다시 잠들었다고 함.

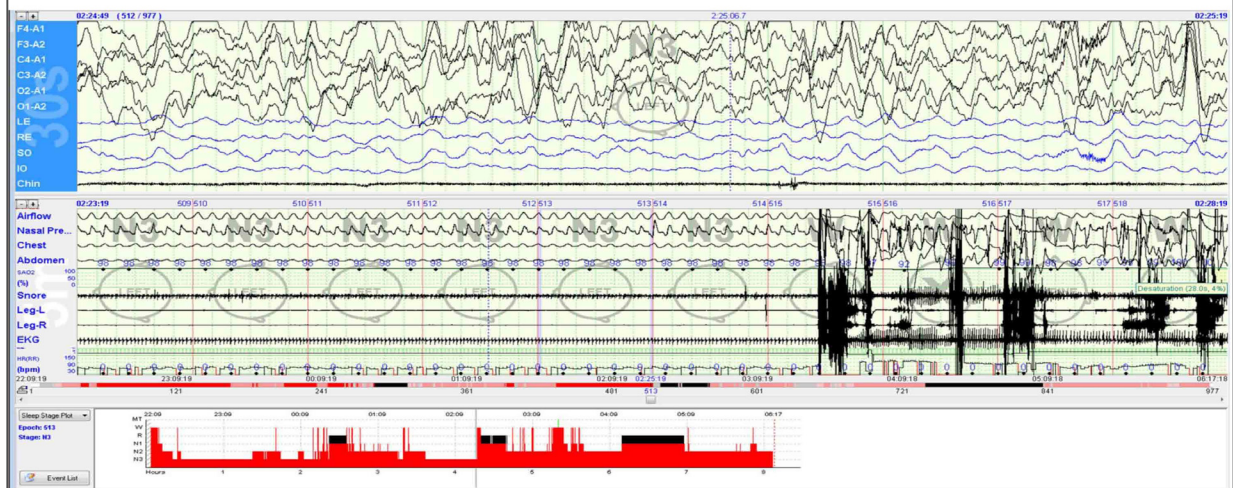
수면 중 깨서 두리번 거리는 증상은

한 달에 1번 정도 관찰된다고 함.

다음날 환자는 수면 중 사건을 기억하지 못하다고 하였다.



Overnight polysomnography
: N3 sleep stage



Parasomnia

Non REM parasomnia (Disorders of arousal)

Confusional arousal

Sleep walking (clinical history +)

Sleep terrors

Sleep related eating disorders (SRED)

Confusional arousals

Episodes of abrupt awakening associated with confusion and disorientation

Prevalence	Lifetime prevalence	: 18.5%
	Children 3 to 13 yrs of age	: 17.3%
	Older than 15 yrs of age	: 2.9-4.2%

When: first half of sleep, deeper NREM sleep stages (N3)

Duration: typically few minutes -> terminated by reinitiation of sleep

Treatment: In most cases, patients outgrow from it.

Sleepwalking

Sleep walking consists displacement taking place out of bed

Prevalence	Lifetime prevalence	: 18.3% (peak age at 12 years)
Incidence	Children 6 to 16 yrs of age	: 40%
	Older than 15 yrs of age	: 2.9-4.2%

When: first half of sleep, deeper NREM sleep stages (N3 sleep stage)

Duration: 1-5 minutes

Treatment: In most cases, patients outgrow from it.

Anticipatory awakenings – several minutes before

Case – 3

F/40

3개월 전부터

수면 중 무엇인가를 계속 먹고는 아침이면 기억하지 못한다고 한다.
아침이면 식탁에 음식들이 흩어져 있으며,
냉동기에 얼린 소고기를 익히지 않고 배어 먹는 적도 있다고 한다.

남편은 환자가 부엌에서 음식 먹는 것을 목격하기도 하였다고 한다.
배고프냐고 물으니
“배가 고파서 먹는다” 라고 대답도 했다고 한다.
하지만, 다음날 남편이 물어보면 기억나지 않는다고 한다.

Sleep related eating disorders (SRED)

- involuntary eating and drinking during arousals from sleep

Consumption of peculiar forms of food or inedible or toxic substances.

Sleep related injurious while in pursuit of food or while cooking food.

Weight gain, various metabolic problems

Prevalence: 8.7~16.7% of patients with eating disorders

When: NREM sleep stages, Nightly eating, including multiple episodes nightly

Commonly associated with sleepwalking and RLS

Precipitating factors: Zolpidem

Other benzodiazepines, benzodiazepine receptor agonists, mirtazapine, risperidone, quetiapine, lithium carbonate, anticholinergics, and various other psychotropic agents)

Memory: partial recall ,may have no recall of having eaten during the night

F/40

3개월 전부터

수면 중 무엇인가를 계속 먹고는 아침이면 기억하지 못한다고 한다.

아침이면 식탁에 음식들이 흩어져 있으며,

냉동기에 얼린 소고기를 익히지 않고 배어 먹는 적도 있다고 한다.

남편은 환자가 부엌에서 음식 먹는 것을 목격하기도 하였다고 한다.

배고프냐고 물으니

“배가 고파서 먹는다” 라고 대답도 했다고 한다.

하지만, 다음날 남편이 물어보면 기억나지 않는다고 한다.

What to ask? 최근 수면제 복용을 하였습니까?

섭식장애가 있습니까?

Polysomnography?

Treatment Options for Disorders of Arousal

Component	Confusional arousal	Somnambulism	SRED	Sleep Terrors
Environmental safety	○	○	○	○
Scheduled anticipatory awakening	○	○		○
Behavioral management	Reassurance of benign nature Avoid precipitants: sleep deprivation alcohol CNS depressants	Avoid precipitants: sleep deprivation Lithium Nonbenzodiazepines receptor agnoists		Reassurance of benign nature Relaxation therapy Hypnosis/autogenic training Psychotherpay
Pharmacologic management	Imipramine Clomipramine Clonazepam	Benzodiazepines Clonazepam Diazepam Triazolam Imipramine Melatonin Paroxetine	Topiramate Dopamine agonists SSRI	Paroxetine Clonazepam Trazodone Hydroxytryptophan Imipramine/Clomipramine

Case – 4**M/10**

3개월 전부터 자다가 깨서 무섭다고 엄마에게 안아달라고 하고 곧 다시 잠이 든다고 함.

주로 새벽에 엄마를 찾는다고 하였으며,
왜 그러냐고 물어보면 “누군가에게 쫓기는 꿈을 꾸었다” 라고 말했다고 함.

Diagnosis: Nightmare

Nightmares

Frightening dreams that often awaken the patient from sleep
And can be accompanied by agitation.

Nightmares are very common in children

- 60% to 75% of children

There is generally full alertness upon awakening from a nightmare
and intact recall of the dream experience.

Tend to occur in the early hours of the morning.

Treatment: reassurance

Case - 5

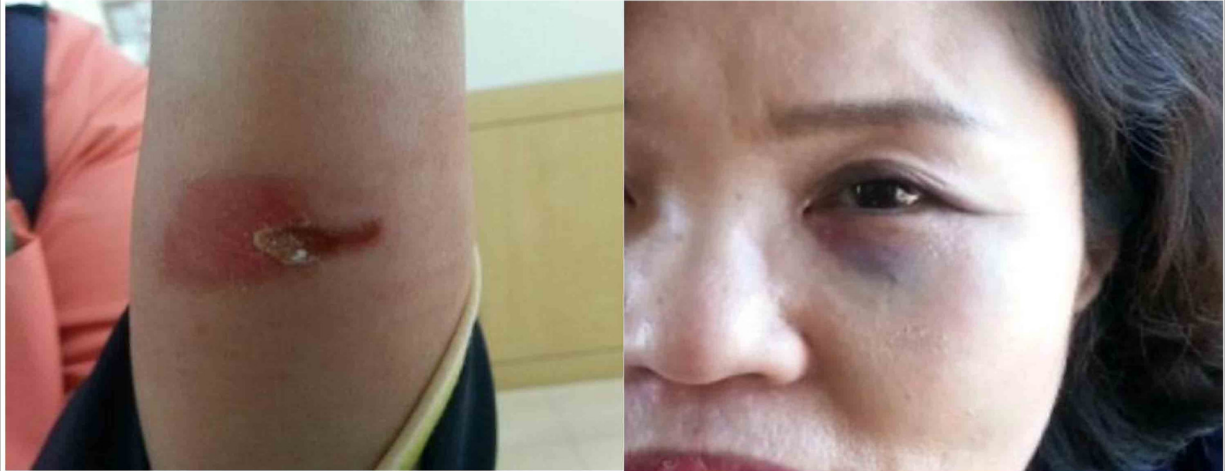
F/63

3년 전부터 잠꼬대가 있어 왔다고 함.

증상은 점점 나빠지고 종종 소리지르면서 옆차기도 하고,
침대에서 떨어지고 하였다고 함.

최근 자고 깨서 거울을 보니 눈에 멍이 들어 있었다고 함.

아침에는 사건을 기억하지 못한다고 함.



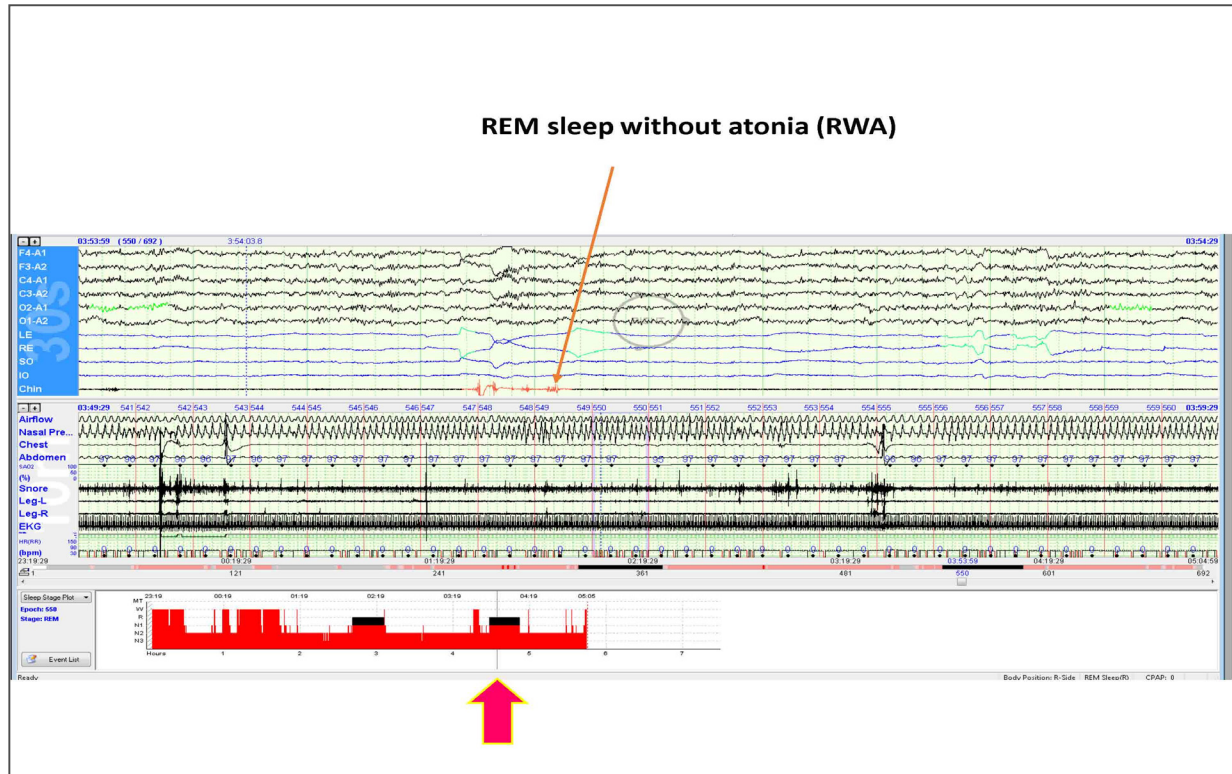
F/63

3년 전부터 잠꼬대가 있어 왔다고 함.
증상은 점점 나빠지고 종종 소리지르면서 옆차기도 하고,
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최근 자고 깨서 거울을 보니 눈에 멍이 들어 있었다고 함.

아침에는 사건을 기억하지 못한다고 함.

증상이 있을 때 깨워보면 누군가와 싸우는 꿈을 꾸었다고 함.
-> parasomnia – REM related.





ICSD – 3 Diagnostic Criteria RBD



Criteria A-D must be met

Repeated episodes of sleep related vocalization and/or complex motor behaviors.

B. These behaviors are documented by polysomnography to occur during REM sleep or, based on clinical history of dream enactment, are presumed to occur during REM sleep.

C. Polysomnographic recording demonstrates REM sleep without atonia (RWA)

D. The disturbance is not better explained by another sleep disorder, mental disorder, medication, or substance use.

Case – 6

F/34

“잠들기가 어렵다”

20대부터 불면증으로 개인병원 수면제 zolpidem 복용하지만, 여전히 잠들기 어렵다.

그 동안 잠들려고 자리에 누우면 다리가
저릿저릿, 이상하게 느껴졌으며,
매일 잠들기 전 이런 불편 감이 지속되고 있다.
따뜻하게 찜질을 하거나 발을 올리면 조금 호전되고,
종종 남편이 주물러 주면 호전되었다.
심 한날은 왔다 갔다 걸어나니 기도 한다.

Learning Objectives

In bed time: 11pm

Sleep latency: 40분 ~ 2시간 (빨리 잠드는 날도 있다)

Awake during sleep: 0-2/night

Awake: 7 am

TST: 7시간

WASO: 30분

Est. sleep efficiency: 93%

Nap (-)

Excessive daytime sleepiness

by Epworth Sleepiness Scale ESS: 4

PLMS: 잘 모른다 함.

IRLSSG (International Restless Legs Syndrome Study Group)**4 3 2 1**

- | | | |
|----|---------------------------------------------------------------------------------------------------------|---|
| 1 | 전반적으로, 하지 불안 증후군으로 인한 팔, 다리의 불쾌감 을 어떻게 평가하시겠습니까? | ✓ |
| 2 | 전반적으로, 하지 불안 증후군 때문에 움직여야 하는 필요성 을 어떻게 평가하시겠습니까? | ✓ |
| 3 | 전반적으로, 하지 불안증후군으로 인한 팔 혹은 다리의 불쾌감은 팔이나 다리를 움직임으로써 얼마나 줄어든었습니까? | ✓ |
| 4 | 하지 불안 증후군 증상으로 인해 수면장애는 얼마나 심했습니까? | ✓ |
| 5 | 하지 불안 증후군 증상으로 인해 낮에 느끼는 피곤함과 졸림 은 얼마나 심했습니까? | ✓ |
| 6 | 하지 불안 증후군은 대체로 얼마나 심했습니까? | ✓ |
| 7 | 하지 불안 증후군 증상을 얼마나 자주 경험했습니까? | ✓ |
| 8 | 하지 불안 증후군 증상이 있을 때 증상은 평균적으로 얼마나 심했습니까? | ✓ |
| 9 | 전반적으로 하지 불안 증후군 증상이 일상적인 활동 (예를 들면; 만족스런 가족관계, 가정생활, 사회생활, 학교생활 또는 직장 생활)을 하는데 미친 영향은 얼마나 심했습니까? | ✓ |
| 10 | 하지 불안 증후군 증상으로 인한 기분장애 (예를 들면; 화남, 우울, 슬픔, 불안, 예민함 등)가 얼마나 심했습니까? | ✓ |

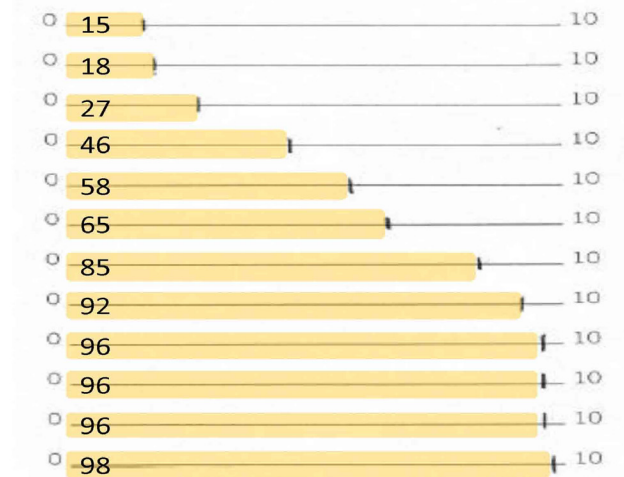
Total 21

4: 매우 심했다, 3: 심했다, 2: 보통이었다, 1: 가벼웠다, 0: 없었다.

Very severe: 31-40, Severe: **21-30**, **Moderate**: 11-20, Mild: 1-10, None: 0 points**Suggested Immobilization Test (SIT)**

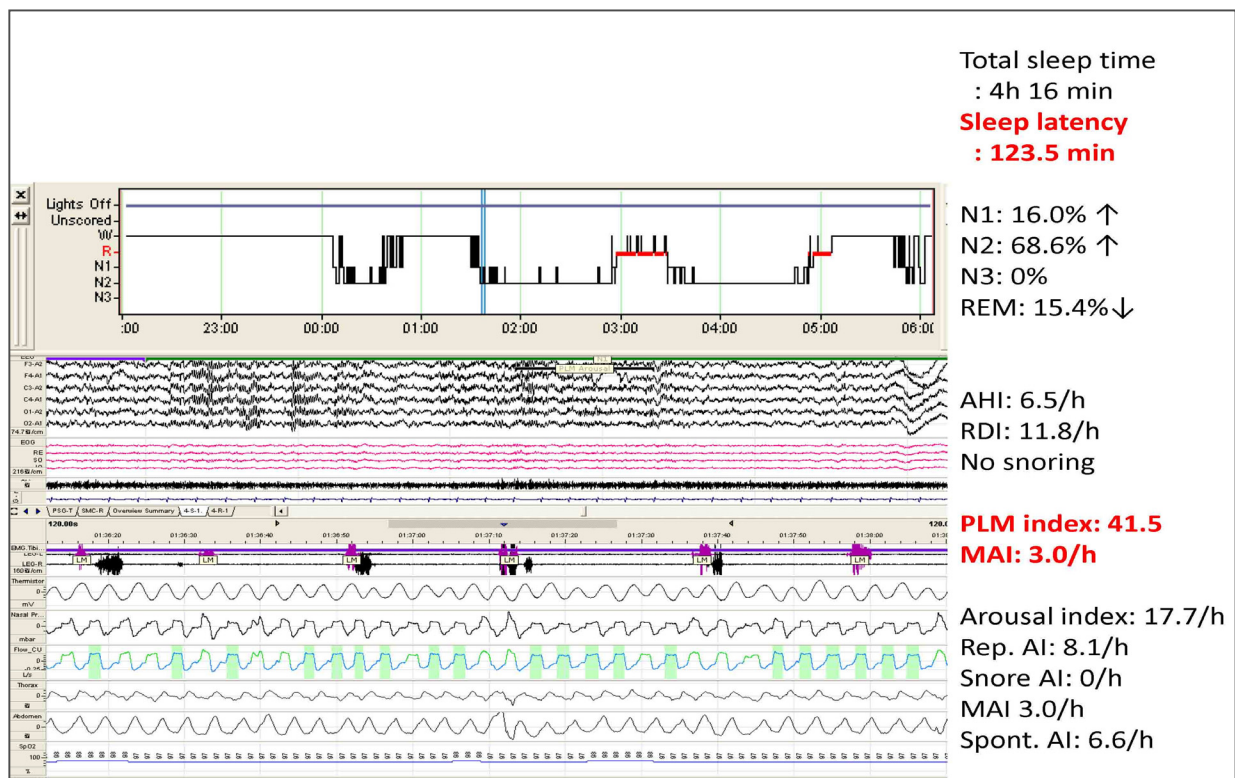
Mean discomfort score: 63.5

* MDS 11점 이상 = RLS (sensitivity: 82%, specificity: 84%)





SMC sleep clinic



ICSD – 3 Diagnostic Criteria RLS



Criteria A-C must be met

- A. An urge to move the legs, usually accompanied by or thought to be caused by uncomfortable and unpleasant sensations in the legs. These symptoms must:**
1. Begin or worsen during periods of rest or inactivity such as lying down or sitting
 2. Be partially or totally relieved by movement, such as walking or stretching, at least as long as the activity continues, and
 3. Occur exclusively or predominantly in the evening or night rather than during the day
- B. The above features are not solely accounted for as symptoms of another medical or a behavioral condition (e.g., leg cramps, positional discomfort, myalgia, venous stasis, leg edema, arthritis, habitual foot tapping).**
- C. The symptoms of RLS cause concern, distress, sleep disturbance, or impairment in mental, physical, social, occupational, educational, behavioral, or other important areas of functioning**

* PLMs, a family history of RLS, and response to dopaminergic therapy are supportive of the diagnosis

Case – 7

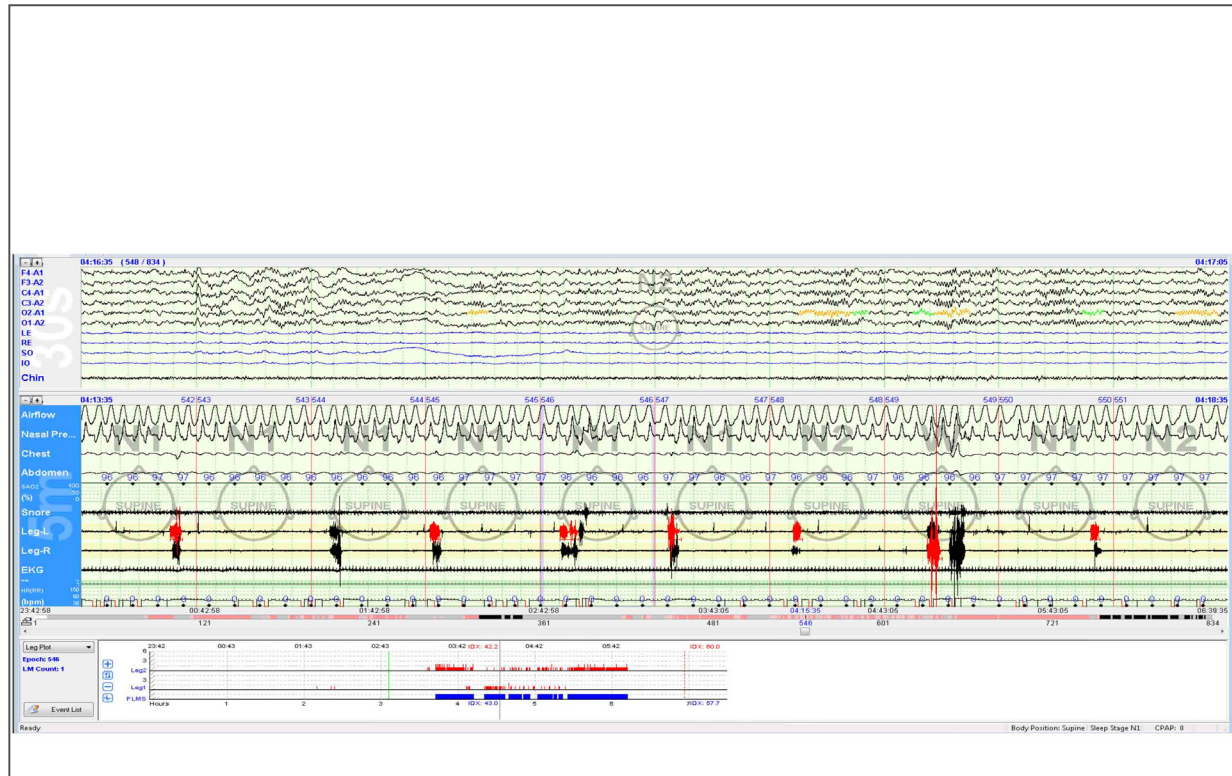
F/62

10년 전부터 잠들기 전에 양쪽 다리가
시린 증상으로 잠들기 어려웠다고 함.

이 와 동반하여 수면 중 다리가 “붕어 뛰듯이” 뛴다고 함.

Diagnosis: Sleep related movement disorders
Periodic limb movement in sleep (PLMS)





ICSD – 3 Diagnostic Criteria PLMS

Criteria A-D must be met



A. Polysomnography demonstrates PLMS, as defined in the most recent version of the American Academy of Sleep Medicine (AASM) Manual for the Scoring of Sleep and Associated Events.

B. The frequency is > 5/hour in children or > 15/hour in adults.

C. The PLMS cause clinically significant sleep disturbance or impairment in mental, physical, social, occupational, educational, behavioral, or other important areas of functioning.

D. The PLMS and the symptoms are not better explained by another current sleep disorder, medical or neurological disorder, or mental disorder (e.g., PLMS occurring with apneas or hypopneas should not be scored).^{4,5}

Non-pharmacological therapy

Good sleep hygiene
Mental activity (video games)
Restriction of alcohol, caffeine, nicotine
Alter sleep patterns (sleep-wake schedule)
Low body resistance training, aerobic exercise
Pneumatic compression to the thigh and leg during sleep
Consider bupropion for RLS patients with depression

Pharmacological therapy

- Dopaminergic agents
 - Levodopa
 - Dopamine agonist
 - non-ergot derivative (Ropinirole, **pramipexole**, rotigotine)
 - Ergot derivative (Bromocriptine, Pergolide, Cabergoline)
- Anticonvulsants (Gabapentin, Pregabalin, Valproic acid)
- Opioids (oxycodone, morphine, tramadol, codeine)
- Benzodiazepines (Clonazepam)
- Iron

ICSD-3 classification (International Classification of Sleep Disorders)

Insomnia

Sleep Related Breathing Disorders

Central Disorders of Hypersomnolence

Circadian Rhythm Sleep-Wake Disorders

Parasomnias

Sleep Related Movement Disorders

Other Sleep Disorder

경청해 주셔서 감사합니다.