Case Number 6
Narcolepsy & Cataplexy

Paula Gauci & Tara Giacchino
Reviewed by: Dr. Malcolm Vella

Case summary:

Demographic details:
Mrs AT, Female, Serbian, Self-employed.

A 35-year-old woman from Serbia presented to the neurology department with a 20 year history of excessive daytime sleepiness and recurrent episodes of dropping to the floor whilst still retaining consciousness. These episodes were brought on by laughing or strong emotions.

Presenting complaint:

Daily excessive daytime somnolence – 20 years
Occasional loss of facial tone brought on by strong emotions – 20 years
Occasional drop attacks brought on by strong emotions – 20 years

History of presenting complaint:

The patient dates her symptoms of excessive daytime sleepiness back to when she was 15 years old and would find it difficult to remain awake during lessons at school. She describes the symptoms as an intense feeling of needing to sleep that would almost always result in her napping for approximately 5 to 20 minutes, after which she would wake up feeling refreshed. This sleepiness occurs daily and is not related to the quantity or quality of her sleep the night before. The fact that it occurs without warning has a negative impact on her life; sometimes she would be driving and would have to stop the car at the side of the road as she would not be able to resist the urge to sleep. This is very worrying to the patient considering she has two young children. The patient also complains of sudden loss of muscle tone during moments of heightened emotion, especially when she is laughing with friends. This symptom also dates back to when she was 15 years old, however is much less frequent lately. When it does occur, it usually affects her facial muscles only, she feels her face begin to droop and she is told that she suddenly becomes expressionless. Rarely, it has affected her whole body tone resulting in her dropping to the floor. These episodes usually last for approximately 30 seconds and are never associated with loss of consciousness. The impact of these symptoms on her life is not as great as those of excessive daytime sleepiness, as she can usually tell when it is going to happen and can warn others around her. The patient has never experienced any hypnagogic or hypnopompic hallucinations and does not recall any episode of sleep paralysis.

Past medical and surgical history:

No significant medical or surgical history of note.

Drug history:

Patient is on no current treatment.

A Serbian doctor had prescribed amphetamines but the patient never actually took them because of fear of dependency.

Family history:

The patient recalls her maternal grandfather having similar symptoms of excessive daytime sleepiness – he was a bus driver and would often need to park his bus at the side of the road to take a nap. However, he was never formally investigated and/or diagnosed.

Social history:

The patient is married with 2 children; a 5-year-old son and an 11-month-old daughter. She smokes and drinks alcohol only occasionally during the weekends. She is self-employed.

Systemic inquiry:

- General Health: Patient is well in general with no remarkable findings on systemic enquiry
- Cardiovascular System: Nil to note
- Respiratory System: Nil to note
- Gastrointestinal System: Nil to note
- Genitourinary System: Nil to note
- Central Nervous System: Nil to note
- Musculoskeletal System: Nil to note
- Endocrine System: Nil to note

Differential diagnosis:[1]

- Narcolepsy with associated cataplexy
- Epilepsy
- Insomnia and other sleep disorders
- Psychiatric illnesses: major depressive disorder, bipolar disorder, psychotic disorder
- Idiopathic hypersomnia
- Conversion disorder
- Malingering

Diagnostic procedures:

The following investigations were carried out in the past:

Test: CT Brain.
Justification for test: To exclude a space occupying lesion or any pathology in the region of the hypothalamus.
Result: Normal CT Scan.
Conclusion: No brain pathology present.

Test: MRI.
Justification for the test: To exclude any neurological pathology in the region of the hypothalamus.
Result: Normal MRI.
Conclusion: No neurological pathology present.

Test: EEG.
Justification for the test: To exclude any abnormal electrical activity in the brain.
Result: Normal EEG.
Conclusion: Normal brain electricity.

Test: Polysomnography.
Justification for the test: To exclude SOREMPs (sleep-onset rapid eye movement periods) and a mean sleep latency of less than 8 minutes which would strongly suggest narcolepsy.
Result: Normal parameters measured.
Conclusion: Normal sleep patterns.

Test: ECG.
Justification for the test: To exclude any arrhythmias.
Result: No abnormalities detected.
Conclusion: Normal heart rhythm.

Therapy:

Drugs:

Drug	Dosage	Frequency	Type	Reason
Modafinil	200 mg	1 - 0 - 0	Psychoanaleptic, centrally acting sympathomimetic[2]	Promotes wakefulness[2]
Methylphenidate Hydrochloride	10 mg	1 - 0 - 1	Psychostimulant	Effective for treatment of daytime sleepiness due to narcolepsy[3]
Selegiline	5 mg	1 - 1 - 0	MAO Inhibitor	Effective treatment for all narcoleptic symptoms[3]
Fluoxetine	20 mg	0 - 0 - 1	SSRI	Effective treatment for cataplexy, sleep paralysis and hypangogic hallucinations[3]

Non-pharmacological treatment[3]

- Scheduled naps to overcome daytime sleepiness.
- Following a diet including light or vegetarian meals throughout the day and avoidance of heavy meals before important activities.
- Making family, friends and colleagues aware of the condition to avoid being labeled as lazy or not interested.

Diagnosis:

The patient's diagnosis is that of narcolepsy with associated cataplexy. Narcolepsy (also known as Gélineau's syndrome) is a rare sleep disorder that affects 0.02% of the population. Patients present in their teenage years or young adulthood with excessive daytime sleepiness that cannot be resisted and that may occur under inappropriate circumstances[4]. Narcolepsy often forms part of a tetrad of clinical features[5]:

- Excessive day time sleepiness with sleep attacks that usually last approximately 15 to 20 minutes, from which the patient wakes up feeling refreshed.
- Cataplexy: sudden loss of muscle tone with retained consciousness that is provoked by heightened emotions.
- Sleep-onset and/or sleep-offset paralysis: an inability to move or speak when falling asleep or waking up respectively.
- Hypnagogic and/or hypnopompic hallucinations: hallucinations occurring whilst falling asleep or waking up respectively. The hallucinations are typically visual or auditory.

However, the most common clinical feature associated with narcolepsy is cataplexy. In fact, the patient reported symptoms of the latter disorder but denied any symptoms of sleep paralysis and hallucinations. The performed tests ruled out other causes of the patient's symptoms.

There is a genetic basis behind the disorder and an apparent association with the HLA DQB1*0602 allele that predisposes individuals to the disorder[4], therefore the fact that the patient's grandfather very likely suffered from the same condition further strengthens the diagnosis.

Final treatment and follow ups:

The patient was started on Modafinil with excellent outcome. She was advised to regularly attend follow-up appointments at Neurology Outpatients in order to monitor her condition and identify potential drug side effects.

She was given precautions as regards dangerous activities and driving.

Fact Box 6:

Gianluca Fava

Title: Narcolepsy
Also known as: Hypnolepsy, Gelineau syndrome

Narcolepsy is a neurological disorder that affects the ability to control and regulate sleep-wake cycles. It is characterised by a disturbance in nocturnal sleep, particularly chronic intense sleepiness and recurrent daytime sleep attacks[6,7]. The exact cause of narcolepsy is not fully understood, but a reduction in the levels of hypocretin has been linked to this disorder. The precise mechanism leading to a decreased production of this protein in the brain is yet unknown but may have several contributing factors[8].

Risk factors:[8,9,10]

- Age: Narcolepsy may appear at any age. Usually symptoms appear during adolescence or young adulthood and are rare before age 5.
- Sex: Narcolepsy affects both men and women.
- Heredity: Low hypocretin levels may be linked to certain genes.
- Autoimmune disorders: Low hypocretin levels may be linked to an autoimmune disorder involving the hypothalamic neurons that produce it.
- Brain injuries: Low hypocretin levels may be a result of brain tumours, strokes or trauma.
- Infections.
- Heavy metals.
- Pesticides and herbicides.
- Smoking and secondhand smoke.

Signs and Symptoms:[7,8,11]

- Excessive daytime sleepiness (EDS): Periods of extreme drowsiness during the day which consist of a strong urge to sleep and are often followed by a sleep attack. These usually last less than 30 minutes can be brought about suddenly by strong emotions, periods of inactivity and meals. Such patients complain of mental cloudiness, lack of energy and extreme exhaustion, problems in focusing and concentration, memory lapses and depression.
- Cataplexy: Sudden loss of muscle tone leading to feelings of weakness and a loss of voluntary muscle control. May range from slurred speech to weakening and buckling of the knees and total body collapse. Most attacks last no longer than 30 seconds and may be missed but may last for several minutes during which time the person is paralysed. Cataplexy may be triggered by strong emotions.
- Hallucinations: Vivid dreams which may occur while dozing, falling asleep or waking up. All senses may be involved.
- Sleep paralysis: Temporary inability to move or speak while falling asleep or waking up. These episodes are usually brief lasting a few seconds or minutes but may be frightening experiences.

Testing and diagnosis: [7,8,12]

- Physical examination.
- Exhaustive medical history.
- ECG: Measuring electrical activity of the heart.
- EEG: Measuring electrical activity of the brain.
- Polysomnography (PSG): This overnight sleep study records brain activity, eye movements, heart

rate and blood pressure. It helps to determine how quickly the patient falls asleep, how often the patient wakes up during the night and how long it takes for the patient to go into rapid eye movement (REM) sleep after falling asleep.

- Multiple sleep latency test (MSLT): This daytime sleep study measures how sleepy a patient is. The patient is required to nap for 20 minutes every 2 hours throughout the day for a total of four or five times during which brain activity is monitored. This test measures how long it takes for the patient to reach various stages of sleep and how quickly the patient falls asleep during the day after a night's sleep.
- Hypocretin test: A lumbar puncture is done to measure the hypocretin levels in the cerebrospinal fluid surrounding the spinal cord.

Treatment:[8,13]

There is no known cure for narcolepsy as of yet and thus treatment aims to control symptoms. This involves:

- Emotional counseling and lifestyle changes: This includes planning naps to decrease the frequency of sudden sleep attacks, possibly after meals. Patients should also eat light during the day and avoid heavy meals before important activities. Bosses and supervisors should be informed about the condition. Patients may also not be allowed to drive and operate certain machinery.
- Stimulant drugs: These may help the patient to stay awake. Armodafinil is usually used but other stimulants may be used, namely dextroamphetamine and methylphenidate.
- Antidepressant medication: This may help to reduce the frequency of hallucinations and episodes of sleep paralysis and cataplexy. Such medication includes selective norepinephrine reuptake inhibitors (SNRIs) such as venlafaxine; selective serotonin reuptake inhibitors (SSRIs) such as fluoxetine, paroxetine and citalopram; and tricyclic antidepressants such as protriptyline and imipramine.
- Sodium oxybate for nighttime use.

References:

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