Narcolepsy

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What is Narcolepsy?
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- Uncommon sleep disorder
- Usually begins in adolescence or young adults and may persist throughout life
- Marked by recurring attacks of sleep during normal waking hours as well as by cataplexy, sleep paralysis, and hallucinations
- Considered to be a disorder of the normal boundaries between the sleeping and the waking states of sleep
- Now believed that this could result from disease processes affecting the brain mechanisms that regulate REM sleep
- Normal individuals sleep for 90 minutes before going into the REM phase. Narcoleptics skip the typical 90 minute phase and go straight into REM.
- Narcoleptic episodes generally last anywhere from a few seconds up to a few minutes. In rare cases, some episodes could last up to an hour or longer.

Sleep Cycle

- For adults a normal nights sleep is about 8 hours composed of 4-6 separate sleep cycles
- Brain Waves
  - Alpha
  - Beta
  - Theta
  - Delta

Alpha Waves

Beta Waves
Sleep Cycle

Non-Rapid Eye Movement (NREM)
- Stage 1
  - Relaxation
  - Alpha
- Stage 2
  - Easily Aroused
  - Sleep Spindles
- Stage 3
  - Muscle Relaxation
  - Vital Signs Decline
  - Theta and Delta Waves
- Stage 4
  - Vital Signs=lowest
  - Slow-wave sleep
  - Delta Waves

Rapid Eye Movement
- Paradoxical Sleep
- Longer
- Frequent
- Dreams
- Recurrence?
Symptoms

- **Excessive Daytime Sleepiness**: first to become clinically apparent. It interferes with the normal activities on a daily basis. There is a persistent sense of mental cloudiness, lack of energy, depressed mood, extreme exhaustion or memory loss. It will create difficulty for an individual to maintain concentration at school or work.
- **Cataplexy**: This is a sudden loss of muscle tone that will lead to weakness and loss of voluntary muscle control during REM sleep.
- **Sleep Paralysis**: This is the temporary inability to move or speak while falling asleep or waking up. Sleep paralysis keeps us from acting out our dreams.
- **Hypnogogic**: These are hallucinations or dreamlike events that will happen at the beginning of sleep.

Possible Causes

- Unknown
- Infections
- Exposure to toxins
- Dietary Factors
- Stress
- Hormonal Change
- Alteration of sleep pattern
Possible Causes

- Abnormalities in the Brain
  - Chromosome 6
  - HLA Complex

Narcolepsy Study in Dogs
Narcolepsy Study in Dogs

- Mignot’s study
  - Dogs
  - Genetics
  - Chromosome 12
  - Hypocretin/Orexin (HO)
    - Hypothalamus
    - Cataplexy

Goat with Narcolepsy
**Research**

- Narcoleptic mice
- Lack the gene for HO
- Interaction of the HO system and the brain

**Incidence**

- Approximately 200,000 Americans have Narcolepsy
- Only 50,000 are diagnosed
- Estimated 150,000 Americans are still undiagnosed
Diagnosis

- Clinical examination
- Thorough medical history
- Electroencephalogram (EEG)
- Specialized Test
  - Polysomnogram (PSG)
    - Night Time
  - Multiple Sleep Latency Test (MSLT)
    - Day Time

Treatments

- Central Nervous System Stimulants:
  - Amphetamines
    - Methylphenidate (Ritalin)
    - Dextroamphetamine
    - Methamphetamine
    - Pemoline
  - Xyrem – FDA approved drug to treat narcolepsy

- Antidepressant Drugs
  - Tricyclics
  - Selective Serotonin Reuptake Inhibitors (SSRI)

- Counseling for depression
- Drug Therapy
- Behavioral Therapy
3 Main Points

- Narcolepsy is a chronic neurological disorder where the brain is unable to regulate the sleep-wake cycle normally.
- Narcolepsy is a very serious disorder that affects all aspects of a narcoleptic’s life. Someone with narcolepsy lives with the fear that at any moment he/she may have an episode and pass out in that very spot.
- It is not known what exactly causes narcolepsy, but research is still being done on dogs, mice, and human corpses to determine if there is in fact a relationship between the HO system and the brain regions that affect the sleep-wake cycle.

Acknowledgments

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