Getting a Good Night’s Rest: Sleep and Parkinson’s Disease

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Substantia Nigra (SN) Acts As A Fountain of Movement

- We have 400,000 SN Dopamine cells
- We lose 2400 a year
- If we lose 70% we will develop PD

- Let’s keep our Dopamine cells
Dopamine – Sleep Connection

- Dopamine and orexin cells regulate our wake-sleep cycle too
- Let’s stay awake now for the sleep part
Sleep Disturbances in PD

- Sleep Apnea(s)
- Insomnia
- REM Behavioral Disorder
- Restless Leg Syndrome
- Periodic Leg Movements
- Excessive Daytime Sleepiness
- Sudden Sleep Attacks
- Sleep-related body pain and rigidity
Sleep Apnea(s)

- One or more pauses in breathing or shallow breaths while sleeping
  - 10+ second episodes
  - Repeated episodes throughout night
  - Must awaken to start breathing again
- Often results in snoring
- 20% of PD patients experience sleep apnea
  - versus 5% in other populations
Sleep Apnea(s)

Risk factors

- Gender (male)
- Obesity
- Age (older)
- Smoking
- Family history
- Alcohol use

Non-Obstructed Airway

Obstructed Airway

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Sleep Apnea(s)

Treatment

• Lifestyle changes
  – Weight reduction
  – Reduction of alcohol
  – Reduction of smoking

• Mouthpieces
• CPAP, BiPAP, ViPAP
Sleep Apneas

• **ACTION # 1:** Determine if you snore or stop breathing in sleep
  - Ask your bed partner
  - Use a sleep app to record
  - Attend a sleep study

• Your bed partner will take you to your doctor
Obstructive Sleep Apnea

(C) Stimulator - OFF

- EOG_L
- EOG_R
- C3-A2
- C4-A1
- O1-A2
- O2-A1
- EMG_chin
- EKG
- EMG_Leg
- Snore
- P_nasal
- Air flow
- Chest
- Abd
- SaO_2

The Victory Summit® – San Antonio, TX | November 14, 2015
Central Sleep Apnea
Complex Sleep Apnea !!!

- CPAP does not help
  - 15% of all apneas
- Need BiPAP or ViPAP
Insomnia

- Persistent difficulty falling or staying asleep
  - Sleep fragmentation
- May cause
  - Nighttime confusion
  - Difficulty moving in bed
  - Vivid dreams
  - Hallucinations
  - Increased urinary frequency
Insomnia

- May also cause
  - Decrease in deep sleep
  - Fragmented sleep
  - Excessive daytime sleepiness

- Present in 30% of Parkinson’s population
  - Unknown percentage in caregivers
Insomnia

Treatment

• Practice good sleep hygiene
  – Keep a regular bedtime and wake time
  – Get sunlight exposure daily
  – Exercise daily, earlier in the day
  – Limit caffeine and alcohol in evenings
  – Empty bladder before going to bed
  – Establish a pre-sleep ritual (reading, bath)
Insomnia

Treatment

• Exercise and gentle stretching before bed
• Relaxation therapy (meditation)
• Medications
  – Hypnotic medications
  – Benzodiazepine
  – Sedating antidepressant
  – Melatonin
Sleep is A Natural Bliss

• **Action #2:** Make your bed your friend, not your enemy
  - Use satin sheets and pajamas to move easier
  - Use the bedroom for sleep and sex, only
  - Keep bedroom dark and quiet (no TV)
  - Keep bedroom at comfortable temperature(s)
Sleep Structures

Young adults

Elderly
REM Behavioral Disorder (RBD)

- Acting out dreams while in REM sleep
  - Fighting, falling, walking
  - May be aggressive, injurious and dangerous
- REM = dreaming stage of sleep
- Sleep paralysis in REM sleep usually keeps us from acting out our dreams
REM Behavioral Disorder (RBD)

- RBD can start up to 15 years before the motor signs of Parkinson’s
- Up to 47% of people with PD have RBD
- Can be diagnosed via sleep study

Treatment

- Clonazepam
  - Small doses help in 80%-90% of cases
- Melatonin
REM Behavioral Disorder

**Treatment**

- Separate bed for care partner
- Pad floor near bed for safety
- Move other furniture away from bed

**Action #3:** If you hit your spouse in sleep – tell your doctor
Restless Leg Syndrome

- Uncomfortable urge to move legs or arms
- Worsen during periods of inactivity/rest
- Cannot fall asleep because of sensations
- Worsen at night
- Relieved by movement

Treatment

- Ask doctor to check Iron and Ferritin
- Dopamine Agonists
Periodic Leg Movements

Horizontal EOG
Vertical EOG
C3-A2
C4-A1
O1-A2
O2-A1
Mental/submental EMG
Left TA muscle
Right TA muscle
Thermocouple
Nasal pressure cannula
Thoracic/abdominal resp. effort

30 sec
Periodic Leg Movements

• Leg extension in a “jerk” or “kick” during sleep
• Movements occur in periodic intervals with 20 – 40 seconds between each kick

Treatment

• Dopaminergic meds
• Gabapentin
• Opioids
• Benzodiazepines
Excessive Daytime Sleepiness

• Dopamine and Orexin are wake promotors
• Orexin (Hypocretin) was found to be low in Parkinson’s, too
• Sleep attacks are often seen in PD

Treatment

• Good sleep hygiene
• Reduce dopamine agonists
Sudden Sleep Attacks

• Dopamine Agonists side effects in 6% of people with Parkinson’s

• Action #5: Limit daytime naps to 30 – 40 minutes
Why are Dopamine Neurons So Fragile?

- There are only 400,000.
- One Dopamine neuron has 1,000,000 synapses and 13 feet long of dendrites
- They require a lot of energy and a lot of mitochondria work
Energy comes from FOOD.

- Braak hypothesis – and prion-like molecules climbing the vagal nerve...

- **Action #6**: Eat well and fight constipation
Physical Activity

News from a California study:

• Exercise until you SWEAT helps PD.
• Muscles release ketones and 100 other substances - extra food for the weak Dopamine neurons
Tom Isaacs Tour of England
Question # 1:

• Parkinson’s patients sleep on average 5 – 6 hours at night and awaken 2 times more often than the general population

• True or False?
Answer #1:

- Parkinson's patients sleep on average 5 – 6 hours at night and awaken 2 times more often than the general population

• True or False?
Question # 2

• Sleep Apnea is seen in what percentage of people with Parkinson’s?
  – 5%
  – 10%
  – 20%
  – 40%
Answer # 2

- Sleep Apnea is seen in what percentage of people with Parkinson’s?
  - 5%
  - 10%
  - 20%
  - 40%
Question # 3

- What percentage of our 400,000 dopamine Substantia Nigra cells need to be nonfunctional in order to produce the first motor signs in Parkinson’s?
  - 10%
  - 40%
  - 70%
  - 90%
Question # 3

• What percentage of our 400,000 dopamine Substantia Nigra cells need to be nonfunctional in order to produce the first motor signs in Parkinson’s?
  – 10%
  – 40%
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  – 90%
Question # 4

What are the possible early non-motor symptoms that we can observe in Parkinson’s patients?

- A  loss of smell
- B  constipation
- C  depression
- D  REM Behavioral Disorder
- E  Body pains
- F  All of the above
Question # 4

What are the possible early non-motor symptoms that we can observe in Parkinson’s patients?

• A  loss of smell
• B  constipation
• C  depression
• D  REM Behavioral Disorder
• E  Body pains
• F  All of the above
Question # 5

What can I do to sleep better??

• A. I will walk and exercise as much as I can
• B. I will be positive
• C. I like chamomile tea with honey at night
• D. I like feet massages
• E. I am not afraid
• F. I will do all of the above and more
Question # 5

What can I do to sleep better??

• A. I will walk and exercise as much as I can
• B. I will be positive
• C. I like chamomile tea with honey at night
• D. I like feet massages
• E. I am not afraid
• F. I will do all of the above and more
Sleep in Parkinson’s

- Dr. James Parkinson, 1817 “SHAKING PALSY”:
  - “Sleep becomes much disturbed. The tremulous motion of the limbs occur during sleep, and augment until they awaken the patient, and frequently with much aggravation and alarm.”
The Forgotten Glial Cells:

We need them all to fight Parkinson’s
Action Items

- **Determine** if you have any sleep disorders by asking your bed partner, using app’s or attending a sleep study
- Make **your bed your friend**, not your enemy
- Practice good **sleep hygiene**
- **Talk to your doctor** about your present sleep disorders
- **Exercise** in the first half of the day – outside if possible for daily daylight intake needs
It is time for your questions.