2022 SAMBA ANNUAL MEETING
MAY 11 – 14 2022

# Parkinson's Disease and Ambulatory Anesthesia

Mary Ann Vann MD, FASA
Boston, MA

1

## Parkinson's Disease Info

- Most often in patients older than 50 ~~60~~
- 1-2% of all adults older than 65
- 13/100K people in US
- 60K new cases each year
- More men than women

- **PROGRESSIVE**



2

## Parkinson's Disease Info

Risk factors/causes

- Genetics
- Head Injuries
- Exposure to pesticides/heavy metals
  - AGENT ORANGE -- VETERANS



3

## Parkinson's Disease: Progression

- Stage 1: Tremor, posture, facial expressions
- Stage 2: + Rigidity, difficulty walking
- Stage 3: + Loss of balance, slowness, falls
- Stage 4: +Walks with walker, can't live alone
- Stage 5: +Wheelchair or bedridden, hallucinations or delusions

Unified Parkinson's Disease Rating Scale (UPDRS)



4

## Parkinson's Disease: Manifestations

- Muscle **rigidity**
- **Tremor at rest**
- Bradykinesia
- **Postural instability** >> gait disturbance
- **Orthostatic Hypotension**
- **Neurocognitive dysfunction**: Depression, sleep disorders
- Dementia
- **Difficulty swallowing**
- Leading **cause of death** is **Aspiration Pneumonia**



5

## Parkinson's Disease: Pathology

- Due to decreased levels of Dopamine in the brain (basal ganglia)
- Less dopamine = enhanced excitatory effects of AcetylCholine
- Need to increase dopamine levels but there are adverse peripheral effects



6

## Parkinson's Ds. Medications

- Dopamine Precursors
- Dopamine Agonists
- Monoamine Oxidase Inhibitors
- Catechol-O-methyltransferase (COMT) inhibitors
- AntiCholinergics
- Prolactin Inhibitors



7

## Levodopa/Carbidopa combinations

**Usual First Line treatment + Most commonly prescribed**

- Levodopa, converted to Dopamine after crossing BB barrier
- Carbidopa does not cross BBB, inhibits decarboxylating enzyme in periphery
  - *GI ABSORPTION (no IV)**
  - *Short acting
  - *Schedule NOT interval



8

## Levodopa/Carbidopa: Side effects

- Decreased myocardial NE stores
- Peripheral vasoconstriction
- → **Orthostatic Hypotension**
- Patients may become desensitized to levodopa over time
- Dyskinesia



9

## Dyskinesia

- Chorea-like movement induced by Levodopa
- Case reports
  - 20mg **Ketamine** relieved tremor, attenuated dyskinesia
  - Dyskinesia disappeared after **midazolam** during conscious sedation (1 mg after dyskinesia increased during procedure done w Midaz 1.5mg sedation)
  - 2 (1990s) - **Propofol** reported to worsen dyskinesia



10

## Parkinsons Ds: Alternate Dosing

Levodopa/Carbidopa gel for infusion into the jejunum

- Endoscopically placed NJ tube – Dosing trial
- Permanent Percutaneous Endoscopic Jejunostomy Tube with Pump
- Improved Quality of Life: More time without symptoms (**ON** Time), with less Dyskinesia
- Perioperative management????
- If infusion D/Ced for period of time, need neurologic consult for replacement therapy****

Drug Des Devel Ther. 2020



11

## Parkinson's Ds: 2nd Line Treatments

- Progression of disease****
- To treat side effects of Levodopa/Carbidopa
- Younger patients, alternate treatments



12

## Parkinson's Medications

Dopamine Agonists

- Pramipexole
- Ropinole
- **Rotigotine (patch)****
- Bromocryptine
- ***Apomorphine - Rescue**
  - Short acting
  - Injected subcutaneously
  - Now also sublingual film
  - Nausea and Vomiting

Marketed to patients for improvement during OFF periods



13

## Parkinson's Medications

MAO – B Inhibitors

- Selegine
- Rasagiline
  - (MAO-B) less degradation of DA in brain, increased sympathetic outflow

COMT Inhibitors (decrease breakdown of DA)

- Entacapone
- Tolcapone

**Amantidine** **



14

## Parkinson's Ds: Newest Drugs

- Inhaled LevoDopa (Inbrija): Improved patients' movement during **OFF** periods – used in addition to regular meds
  - Up to 5x/day
- Safinamide (Xadago) MAO-B
- Istradefylline (Nourianz) acts on the adenosine receptor, which modulates the dopaminergic system, but is not directly dopaminergic
  - Prolongs action of Levodopa/carbidopa



15

## Parkinson's Ds: Perioperative Medication Management

- Patient should take **scheduled doses** prior to surgery and any missed dose immediately after surgery
- Always **BRING MEDICATION WITH THEM**



16

## Parkinson's Disease + Anesthesia

**Increased risk of perioperative events**

- Levodopa ½ life short, no meds for 6-12 hours can affect **ventilation**
  - Respiratory failure due to weakness and rigidity
- Autonomic dysfunction: salivation, dysphagia, aspiration risk, hypotension
- Higher risk of postop confusion, hallucinations
- ? Ability to follow instructions on medications pre and post-op



17

## Parkinson's Ds: Anesthesia Drugs

Avoid/ Caution:

- Metoclopramide, prochlorperazine (anti dopaminergic)
- Haldol (worsens symptoms)
- Fentanyl, Remifentanil (rigidity)



18

## Parkinson's Disease + Anesthesia

# Is Regional Better?



19

## Patient Selection

Is your facility prepared to care for a patient with severe Parkinson's symptoms due to discontinuation of medications?

- Intubation, ventilation
- Administration of rescue medications
- Transfer



20

## Real Case

- 66 year old man presents for Colonoscopy at the Endoscopy center (in medical office bldg)
- He takes **2*** Anti-Parkinson's medications
- He arrives at 12:45 for 1:30pm case
- I meet him in the procedure room
- He has not taken ANY Parkinson's medications since the evening before



21

## Real Case

### What are the issues?

- Is he Eligible for anesthesia at this location?
- What is his current physical state?
- What are our options?



22

## Real Case

- What are the issues?
  - He is ineligible by the patient selection criteria
  - He also did not receive proper medication instructions
  - He feels weak
  - Risks of hypoventilation and aspiration
  - Moderate sedation is NOT a good option
- Patient brought his medications with him



23

## Real Case

### What happened?

- Delayed case, patient took his medications
- Patient felt better
- Nurse described him as a "different person"
- Colonoscopy was done 2 hours late



24

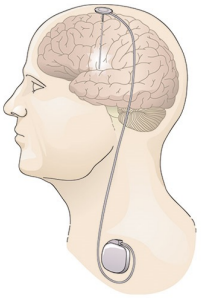
## DBS for Parkinson's Ds

What is it?

- Intracranial electrode(s), fixed to skull
- Extension Cable
- Implanted Pulse Generator (usually located in chest or abdomen)
- **To correct the chemical imbalance**



25



NIH National Institute of Neurological Disorders and Stroke



26

## Perioperative Management of DBS

- Preop CXR to trace leads
- Risk to patient if leads conduct electrical current, etc. to brain
- **Turn off stimulator (*may cause akinesis*)**
- Electrocautery: Bipolar, dispersal pad placement
- Defibrillators and AICDs: away from neurostimulator, lowest energy, careful with magnet
- Turn On **ASAP**

BJA 2009



27

## Perioperative Manageme

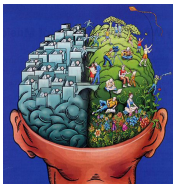
- Preop CXR to trace lead
- Risk to patient if l rent, etc. to brain
- Turn off *tremor*)
- Ele ersal pad placement
- S: away from neurostimulator, eful with magnet
- Tu P

Continue regular medications

BJA 2009



28



**Thank you!!**



29



30