Dystonia in PD:  
-- unwanted spasms

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Financial Disclosures:

Salary & Grant Support: NIH, Washington U., American Parkinson Disease Association (APDA), Greater St. Louis Chapter of the APDA, McDonnell Center for Higher Brain Function, Barnes-Jewish Hospital Foundation, Huntington Disease Society of America, CHDI, Fixel Foundation, Oertli Fund, MJ Fox Foundation, Murphy Fund, U Michigan, U Toronto


Speaker’s Bureau: none

Equity & Consulting Agreements: none
Outline of Talk

- What is dystonia?
- Relationship to early PD
- Response to PD treatment
- How to treat dystonia in PD
DYSTONIA

• A syndrome of sustained or intermittent muscle contractions causing abnormal movements, postures or both.

Albanese A et al, Mov Disord 2013
Cranial Dystonia

mean age onset: 52
72 % female

Weiss E et al, Mov Disord 2006
Lower facial dystonia
Cervical dystonia
75% female; mean age onset: 45
60% with tremor

Sensory Trick

Weiss E et al, Mov Disord 2006; Norris SA et al Mov Dis 2016
Hand dystonia

Mean age onset: 40; 55% female

Weiss E et al, Mov Disord 2006
Dystonia: gait

15194, age onset: 8
Dystonia: legs ➔ swimming

15194, age onset: 8, not DYT1
Dystonia in PD

• Early manifestation of PD
• Related to medication
PD: Limb posture
PD: flexed neck
PD: foot dystonia
Genetics

• Dystonia more likely in young onset PD

• More likely in early onset genetic PD
  parkin: autosomal recessive, juvenile onset, chromosome 6

Drug responses in PD: dystonia

OFF period dystonia

Diphasic/end of dose

Peak dose

OFF period dystonia

L-dopa

OFF period dystonia

diphasic
Dystonia: Medication Effects

Dystonia

Dyskinesia

Off meds

On meds
Dystonia: Medication Effects

Peak dose: Blepharospasm

Off meds               On meds
Dystonia: Medication Effects

End of Dose dystonia: feet
PD: OFF dystonia - hand
Controlled release levodopa & Rytary
MAOB Inhibition: Selegiline, Rasagiline, Safinamide

Periphery | Brain
---|---
3-OMD | 3-OMD

\[
\text{COMT} \quad \text{COMT}
\]

levodopa | levodopa

\[
\text{AADC} \quad \text{AADC}
\]

dopamine | dopamine

\[
\text{MAOB} \quad \text{MAOB}
\]

DOPAC | 3-MT

\[
\text{COMT} \quad \text{COMT}
\]

HVA

Blood-brain barrier
COMT Inhibition: entacapone, tolcapone
Levodopa Gel via PEG

Olanow et al, 2013
Abbruzzese et al, 2012
L-dopa $\rightarrow$ dopamine

Presynaptic neuron

Dopamine

Synapse

Postsynaptic neuron

Dopamine

Dopamine Receptor
Dopamine Agonists

• Orthostasis
• Psychosis
• Compulsive behaviors
• Daytime sleepiness
daytime somnolence/insomnia
• GI upset

• Bromocriptine
• Pramipexole
• Ropinirole
• Rotigotine
  – Transcutaneous administration
• Apomorphine
  – Rapid action
  – Injection
  – Nausea & vomiting
Botulinum toxin injections
Botulinum treatment of Cervical Dystonia
Deep Brain Stimulation Targets

Pallidal DBS for dystonia

https://youtu.be/kAIMTW0iP4w
Microelectrode targeting
Effects of DBS

Pre-Op: off    Post-Op: on
Collaborators

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