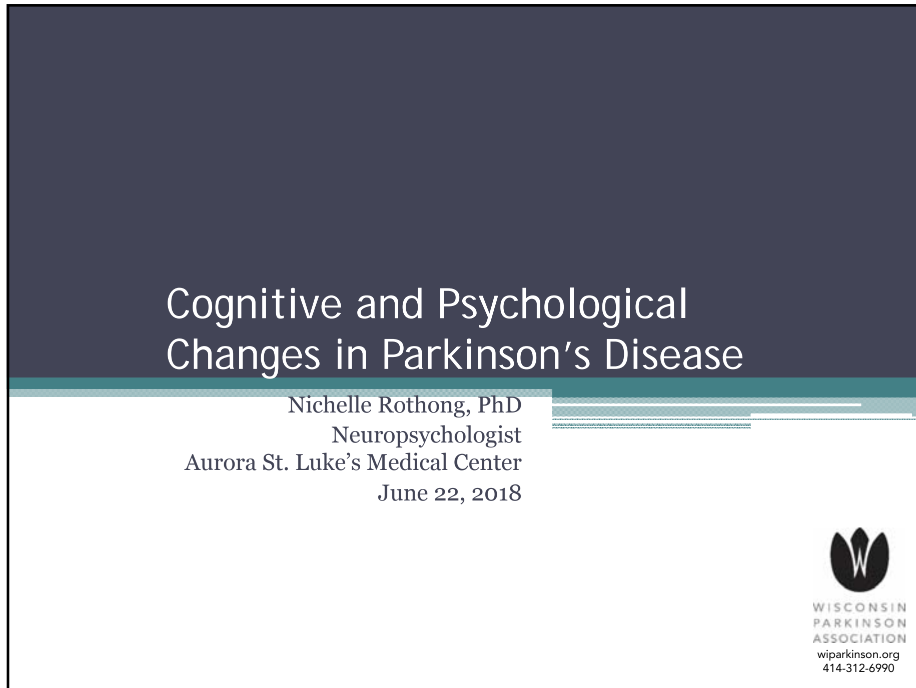
WISCONSIN
PARKINSON
ASSOCIATION
Parkinson Disease
SYMPOSIUM
a community education program on Parkinson disease
Gold Sponsors:
abbvie
Medtronic
US WorldMeds
MOVING FORWARD TOGETHER | wiparkinson.org | 414-312-6990


Cognitive and Psychological Changes in Parkinson's Disease
Nichelle Rothong, PhD
Neuropsychologist
Aurora St. Luke's Medical Center
June 22, 2018
WISCONSIN
PARKINSON
ASSOCIATION
wiparkinson.org
414-312-6990

Agenda

- Background information on Parkinson's disease (PD)
- Cognitive changes in PD
- Psychological changes in PD

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Parkinson's disease (PD)

- Chronic, progressive neurodegenerative movement disorder
- Frontal-subcortical dysfunction
- Cardinal symptoms:
  - Resting tremor
  - Bradykinesia
  - Rigidity

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Prevalence and incidence

- PD affects 100-200 per 100,000 individuals
- Annual incidence rate is estimated to be 15 per 100,000
- Incidence increases with age
- More common in men

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Non-motor symptoms

- Cognitive difficulties
  - PD-Mild Cognitive Impairment (PD-MCI)
  - PD-Dementia (PDD)
- Psychiatric problems
- Sleep disturbance
- Pain
- Sensory disturbance
- Autonomic dysfunction

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Potential factors contributing to cognitive dysfunction in PD

- Age
- Cognitive reserve
- Genetics
- Lewy based pathology (Lewy bodies and Lewy neurites)
- Alzheimer's disease pathology
- Vascular disease, cerebral amyloid angiopathy, and hippocampal sclerosis

Cognitive changes in PD

- The most characteristic cognitive deficits in PD are in the domains of
  - Attention/working memory
  - Visuospatial function
  - Memory
  - Executive functions

Attention/working memory

- Attention: focus
- Concentration: prolonged/sustained focus
- Working memory: ability to hold information in mind and manipulate it

- Significant fluctuations in attention are commonly observed in established PDD
- Complex attention deficits
- Working memory is typically impaired

Processing speed

- Speed at which an individual processes information

- Commonly impaired in PD

Language

- Expressive
- Receptive

- Core language functions typically intact
- Hypophonia and dysarthria are common
- Diminished speech output

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Visuospatial/constructional function

- Ability to perceive visuospatial material in the environment
- Ability to draw/construct material

- Visuospatial/constructional deficits are usually seen in established PDD

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Memory

- Explicit and implicit memory
- Verbal and visual/visuospatial memory

- At the onset of PDD, memory deficits are less severe than those observed in Alzheimer's disease
- Memory dysfunction in PD usually presents with a pattern of retrieval limitations

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Executive functions

- Higher level cognitive functions associated with frontal lobe functioning and frontal subcortical circuitry

- Executive functions are commonly compromised in PDD
- Executive dysfunction may contribute to memory difficulties in PD

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

PD-Mild Cognitive Impairment

- MCI is common in individuals with PD without dementia
  - Approximately 27% of individuals with PD meet criteria for PD-MCI
- Predicts the development of dementia
- Associated with increasing age, disease duration, and disease severity

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Diagnostic criteria for PD-MCI

- Inclusion criteria
  - PD diagnosis
  - Gradual decline in cognitive functioning
  - Cognitive deficits on formal neuropsychological testing or a scale of global cognitive abilities
  - Cognitive deficits are not sufficient to significantly interfere with functional independence

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Diagnostic criteria for PD-MCI

- Exclusion criteria
  - Diagnosis of PDD
  - Other primary explanations for cognitive impairment
  - Other PD-associated comorbid conditions that can potentially influence cognitive testing

Diagnostic criteria for PD-MCI

- Abbreviated assessment
  - Impairment on a scale of global cognitive abilities validated for use in PD

    or
  - Impairment on at least two tests, when a limited battery of neuropsychological tests is performed

Diagnostic criteria for PD-MCI

- Comprehensive assessment
  - Neuropsychological testing that includes two tests from five cognitive domains
  - Impairment on at least two neuropsychological tests
  - Impairment on testing can be defined a few different ways

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Subtype classification of PD-MCI

- Clinical profile of PD-MCI is varied
- PD-MCI single-domain
- PD-MCI multiple-domain
- Most common subtype is non-amnestic, single domain impairment

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

PD-MCI

- Predictors for PDD:
  - Non-amnestic, single domain MCI
  - Executive functioning limitations
  - Visuospatial deficits
  - Language weaknesses
  - Memory limitations

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Parkinson's disease dementia (PDD)

- 50% of individuals with PD develop dementia after 10 years
- More than 80% develop dementia after 20 years
- Mean age at PDD diagnosis is approximately 71.6 years old

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Risk factors for PDD

- Age is the greatest risk factor for developing PDD
- Other risk factors include
  - Severity of motor dysfunction
  - Disease duration
  - Facial masking at presentation
  - Past/comorbid depression
  - Male sex
  - Lower education level/SES
  - Cerebrovascular disease
  - Levodopa side effects

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Diagnostic Criteria for PDD

- Core features
  - PD diagnosis
  - Dementia syndrome with insidious onset and slow progression, developing within the context of established PD, as evidenced by:
    - Impairment in >1 cognitive domain
    - Decline from premorbid functioning level
    - Functional impairment

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Diagnostic Criteria for PDD

- Associated clinical features
  - Cognitive features
    - Impairment in attention, visuospatial functions, memory, executive functions
    - Core language functions largely preserved, though word finding difficulties and deficits comprehending complex sentences may be observed

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Diagnostic Criteria for PDD

- Associated clinical features
  - Behavioral features
    - Changes in mood or personality
    - Hallucinations
    - Delusions
    - Apathy
    - Excessive daytime sleepiness

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Diagnostic Criteria for PDD

- Features which make PDD diagnosis uncertain or may rule it out
  - Time interval between the development of motor and cognitive symptoms unknown
  - Co-existence of any other abnormality which may independently cause cognitive impairment
  - Delirium

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Managing cognitive changes

- Thorough medical and psychiatric workup to explore other potential contributors to cognitive difficulties
- Medication review
- Pharmacological and psychological treatment
- Future planning
- Family support and caregiving resources

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Psychological changes

Mood disturbance

- Affective disorders frequently predate onset of motor symptoms
- Depression occurs in 40-50% of individuals with PD; similar rate for anxiety
- Manic and hypomanic symptoms are not well characterized in PD
- Drug-induced or fluctuating mood states may correlated with "on-off" periods

Depression

- Persistent and pervasive low mood
- Reduced enjoyment from previously enjoyable activities
- Decline in interest level
- Significant pessimism
- Negative thinking
- Hopelessness and helplessness
- Guilt
- Tearfulness
- Suicidal ideation

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Hallucinations and delusions

- Hallucinations are common in PD
- Hallucinations in non-demented individuals with PD are a strong predictor of subsequent dementia
- Visual hallucinations are approximately twice as common as auditory hallucinations
- Delusions are less common

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Apathy

- Rates of apathy have been found to range from 17% in non-demented PD individuals to 54% of individuals with PDD
- Symptoms include deceased spontaneity, loss of motivation, reduced interest, diminished effortful behavior

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Impulse Control Disorders (ICDs)

- Dopaminergic medication-related ICDs
- ICDs have been found to have a frequency of approximately 14% in PD
- Behaviors may include
  - Excessive gambling
  - Compulsive shopping
  - Hypersexuality
  - Compulsive eating
  - Overuse of dopaminergic medications
  - Hoarding
  - Impulsive smoking
  - Kleptomania

WISCONSIN PARKINSON ASSOCIATION
wiparkinson.org
414-312-6990

Managing psychological changes

- Antidepressants
- Psychotherapy (e.g., CBT)
- Exercise
- Sleep hygiene
- Peer support groups
- Caregiver support

References

- Cosgrove, J., et al. (2015). Cognitive impairment in Parkinson's disease. *Postgraduate Medical Journal, 91*: 212-220.
- Dubois, B., & Pillon, B. (1997). Cognitive deficits in Parkinson's disease. *Journal of Neurology, 244*: 2-8.
- Emre, M., et al. (2007). Clinical diagnostic criteria for dementia associated with Parkinson's disease. *Movement Disorders, 22*(12): 1689-1707.
- Galvin, J. E. (2006). Cognitive change in Parkinson disease. *Alzheimer Disease and Associated Disorders, 20*(4): 302-310.
- Hely, M.A., et al. (2008). The Sydney multicenter study of Parkinson's disease: the inevitability of dementia at 20 years. *Movement Disorders, 23*(6): 837-844.
- Stucky, K. J., et al. (Eds.). (2014). *In Neuropsychology Study Guide & Board Review.* New York, NY: Oxford University Press.
- Litvan, I., et al. (2012). Diagnostic criteria for Mild Cognitive Impairment in Parkinson's disease: Movement Disorder Society task force guidelines. *Movement Disorders, 27*(3): 349-356.
- Marsh, L. (2013). Depression and Parkinson's disease: Current knowledge. *Current Neurology and Neuroscience Reports, 13*(12): 409.
- Mayo Foundation for Medical Education and Research. (2018). Parkinson's disease. https://www.mayoclinic.org/diseases-conditions/parkinsons-disease/diagnosis-treatment/drc-20376062
- Voon, V., et al. (2011). Impulse control disorders in Parkinson's disease: Recent advances. *Current Opinion in Neurology, 24*(4): 324-330.