



Cognitive and Neuropsychiatric Issues in Parkinson's Disease

Making yourself your best

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Objectives

1. Cognition and Parkinson's Disease
2. Neuropsychiatric symptoms in Parkinson's Disease
3. Health Promotion: Exercise, Social Support, Intellectual Stimulation

Cognition and Parkinson's Disease

What is Cognition?

- Mind: The element of a person that enables them to be **aware** of the world and their experiences, to think, and to feel; the faculty of consciousness and thought.
- Psychology: The scientific study of the **human mind** and its functions, especially those affecting behavior in a given context.
- Cognition: Acquisition of **knowledge** and **understanding** through thought, experience, and the **senses** resulting in a **perception, sensation, notion** or intuition.

http://www.oxforddictionaries.com/us/definition/american_english/psychology

<http://longislandneuro.com/patient-education/nervous-system>

Benton & Sivan (2007) Clinical Neuropsychology: A Brief History in Mercury, Kehoe, Tschan, Disease A Month.

http://farm1.static.flickr.com/143/338766516_caef660b50_m.jpg

Neuropsychology:

The measurement of the cognitive domains (executive functioning, language, visuospatial and memory) in the context of normative expectations (e.g. age).

The study of the relationship between behavior, emotion, and cognition on the one hand, and variations in **brain** function produced by genetics, injury, disease, medications, etc. on the other hand

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Cognitive Changes in Parkinson's Disease

- Specific cognitive deficits can be observed in 30-40%
- However, there is extensive individual variation in the patterning of cognitive symptoms with some people showing no identifiable deficits
- These cognitive deficits do not constitute dementia

Cognitive Changes

Simple attention	Spared
Executive Functioning	Impaired*
Psychomotor Speed	Slowed
Language	Spared†
Memory	Impaired free recall
Visuospatial	Impaired

*This domain can impact emotional expression and behavior

†This domain is impacted by expressive communication issues

Cognitive Changes: Executive Functioning

Concentration

Self-regulation/Maintenance of focus

Slowed thinking (*bradyphrenia*)

Mental flexibility

Multi-tasking

Planning organizing, sequencing

Problem Solving

Effecting closure between tasks (interference)

Apathy

Initiation (can be mistaken for laziness, depression)

Persistence/follow through

Impulse Control Disorders (obsessive compulsive behaviors)

Cognitive Changes: Language (spared)

Issues interfering with language

Hypophonia (reduced volume)

Micrographia (reduced handwriting size)
and tremor related changes

Monotone

Huskiness of voice

Festination (similar to stuttering)

Dysarthria (slurred speech)

Slow speech pattern

Slowness of thought in conversations

Learning and Memory in Parkinson's Disease

- Learning: process of acquiring new information
- Memory: persistence of learning that can be retrieved at a later time
 - Direct Recall (immediate and delayed)
 - Recognition (delayed)
- Memory in Parkinson's Disease
 - People will learn information but immediate recall may be less than delayed recall
 - Delayed recognition will be normal

Cognitive Changes: Visual

Negotiating orientation in space

Visuospatial –mental and manual

Understanding facial emotion



Facial Expression and Emotions

“Every person unconsciously learns to ‘read’ the outward expressions of other people and apply past experience to determine what these outward signs indicate about what the other person is feeling” (author unknown)



Cognitive Changes: Visual – Expression/Capacity to recognize emotions

“When the eyes say one thing, and the tongue another, a practiced man relies on the language of the first.” – Ralph Waldo Emerson

Anosognosia: Impaired self-awareness of deficits

- Preserved insight: Historically patients with Parkinson's Disease have appeared to have good insight, at least to deficits such as memory
- Changed in self-awareness have been reported in subcortical disease such as Parkinson's Disease
 - Range from a patient not noticing that their arm is not swinging when walking to dyskinesias (abnormal involuntary movements) that can be distressing to observers
 - Patients might rate their functioning as higher than caregivers would rate it
 - Includes hypophonia (reduced voice volume)
- Less negative reaction to errors
- Impulse control disorders: Impaired self-awareness does not result in impulse control disorders (e.g. pathological gambling, excessive spending, and hypersexuality). Here the person knows intellectually that what they are doing is wrong, however, they are unable to resist the urge to do so.



Disease Progression

Presymptomatic, MCI, Dementia



Mild Cognitive Impairment (MCI)

- First described by Ron Petersen MD PhD at the Mayo Clinic
- Memory (Cognitive Performance typically 1.5 standard deviations below age and education matched normal.
- Memory loss (Cognitive Performance) causes an inconvenience but doesn't interfere with ADLs. MCI subjects are functioning independently in the community.
- MCI carries 15-18% risk of conversion to dementia
- Now can be any cognitive domain (i.e. executive, language, visuospatial, memory) and is classified as follows: Amnestic MCI, nonAmnestic MCI, Multidomain Amnestic MCI, Multidomain nonAmnestic MCI

Mild Cognitive Impairment (MCI)

aka DSM V Mild Neurocognitive Disorder

- **Modest** cognitive decline from previous level of performance in one or more cognitive domain (complex attention, executive functioning, learning and memory, language, perceptual-motor or social cognition) based on:
 - Concern by patient, collateral, the clinician that there has been a **mild** decline in cognitive function
 - **Modest** impairment in cognitive performance documented by neuropsychological other quantifiable clinical assessment
- **Preservation** of independence in functional abilities (i.e. complex instrumental activities of daily living (e.g. paying bills, managing medications are preserved although greater effort, compensatory strategies, or accommodations may be required)).
- Patient does not have an acute confusional state (delirium)
- Cognitive deficits are not better explained by another mental disorder
- Specify: without behavioral disturbance
 - with behavioral disturbance (e.g. psychotic symptoms, mood disturbance, apathy etc.)

Dementia

aka DSM V Major Neurocognitive Disorder

- **Significant** cognitive decline from previous level of performance in one or more cognitive domain (complex attention, executive functioning, learning and memory, language, perceptual-motor or social cognition) based on:
 - Concern by patient, collateral, the clinician that there has been a **significant** decline in cognitive function
 - **Substantial** impairment in cognitive performance documented by neuropsychological other quantifiable clinical assessment
- **Interference** with functional abilities at minimum requiring assistance (i.e. complex instrumental activities of daily living e.g. paying bills, managing medications)
- Patient does not have an acute confusional state (delirium)
- Cognitive deficits are not better explained by another mental disorder
- Specify: Mild – difficulties with complex instrumental activities
Moderate – difficulties with basic activities (feeding, dressing)
Severe -- fully dependent

Lewy Body Dementia

- second most frequent cause of dementia (12%)
- associated with abnormal clumps of a protein called alpha-synuclein
- 2 Types
 - Parkinson's Dementia
 - Dementia with Lewy Bodies

Lewy Body Dementia (LBD)

In the healthy brain, alpha-synuclein has important roles in neurons (nerve cells), at synapses, where brain cells communicate with each other. In LBD, alpha-synuclein forms into clumps inside neurons, causing them to die

<https://www.nia.nih.gov/alzheimers/publication/lewy-body-dementia/basics-lewy-body-dementia>

Parkinson's Disease Dementia vs. Lewy Body Dementia

- Parkinson's Disease Dementia: Dementia develops after an established motor disorder, we call the disease PDD
- Dementia with Lewy Bodies: Dementia develops prior to or at the same time as the motor disorder, we call the disease DLB.
- Continuum? Despite differences in the initial sequence of symptoms, the underlying brain changes are very similar leading some researchers to believe they are on a continuum of a similar disease process

Dementia with Lewy Bodies

- Core Features:
 - Fluctuating cognition
 - Recurrent visual hallucinations
 - Parkinsonism
- Suggestive Features
 - REM Behavior Disorder (RBD, dream enactment)
 - Abnormal result on brain scan (PET, SPECT)
- Diagnosis
 - Probable: 2 core and 1 or more suggestive
 - Possible: 1 core and 1 or more suggestive



Dementia with Lewy Body (Differential Diagnosis)



Cognition and Parkinson's Disease

- Cognitive changes in Parkinson's Disease
- Mild Cognitive Impairment
- Dementia

Neuropsychiatric Symptoms in Parkinson's Disease

Influence on cognition and the brain's
interpretation of the world around it

Neuropsychiatric Symptoms: Anxiety

- Anxiety --faulty activation of fight or flight system at times when there is no fear causing stimuli present.
 - Your behaviors are mostly under your control, but anxiety can make it extremely hard to control habits and behavioral desires
- Anxiety disorders include: panic disorder, agoraphobia, specific phobia, social anxiety disorder or phobia, and generalized anxiety disorder
- Involves awareness of 2 components
 - Physiological sensation (palpitation, sweating)
 - Awareness of being nervous and frightened
- Shame can increase anxiety

Neuropsychiatric Symptoms: Anxiety

- 60% of patients with Parkinson's experience anxiety.
- Anxiety may predate symptoms and diagnosis of Parkinson's by some 10 years and can compromise attention/concentration!
- Anxiety is very treatable!

Anxiety Changes How People Perceive the World

- Produces confusion and distortion of perception, not only of time and space but also of persons and the meanings and events.
- Can interfere with learning by lower concentration, reducing recall and impairing the ability to relate one item to another, i.e. to make associations
- Selectivity of attention: anxious people select certain things in their environment and overlook others in their effort to prove that they are justified in considering the situation frightening.
- Rumination (“moping behavior”)
 - need or desire to be alone with your own thoughts and to "deal with your anxiety" without the help of others, without engaging in fun life activities. Feeling fatigue from the stress—wanting to be alone to get better. Your thoughts are your enemy.
- **Agoraphobia** -- fear of being unable to escape--someone that refuses to leave their own and a few very select environments (like work).
- **Other Behaviors of Anxiety**
 - Negative self-talk (i.e. "I am going crazy" or "I am going to embarrass myself.")
 - Feeling as though you are going crazy.
 - Convincing yourself something is wrong with you.
 - Sleep disturbances.
 - Changes in posture or activity as a result of anxiety.

Neuropsychiatric Symptoms: Major Depression DSM 5

- Experiencing symptoms almost every day for at least two weeks.
- More intense than the normal fluctuations in mood that all of us experience in our daily lives.
- You must experience at least five symptoms total from the list below.
 - At least one of these:
 - Depressed mood most of the day, almost every day, indicated by your own subjective report or by the report of others. This mood might be characterized by sadness, emptiness, or hopelessness.
 - Markedly diminished interest or pleasure in all or almost all activities most of the day nearly every day.
 - And three to four of these:
 - Significant **weight** loss when not dieting or weight gain.
 - Inability to **sleep** or oversleeping nearly every day.
 - Psychomotor agitation or retardation nearly every day.
 - Fatigue or **loss of energy** nearly every day.
 - Feelings of **worthlessness** or excessive or inappropriate **guilt** (which may be delusional) nearly every day.
 - Diminished ability to think or **concentrate, or indecisiveness**, nearly every day.
 - Recurrent **thoughts of death** (not just fear of dying), recurrent **suicidal** ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

Neuropsychiatric Symptoms: Depression

- 40% of Parkinson's patients
- Depression affects cognition:
 - Slowed processing of information
 - Retrieval memory problems (impaired recall)
 - Amplify executive dysfunction
- Suicidal ideation – lower than the general public
- Depression is very treatable!

Depression Changes How People Perceive the World

- People with depression often say that they experience the world differently from others.
- “time seems to drag on” and this altered perception of time may lead to feelings of helplessness, or the feeling that one is not in control of their lives
- cannot differentiate between low and high fat concentrations
- reduced sensitivity to visual contrast compared with healthy controls.
- Disordered sleep, reduced energy
- Reduced sex drive

BrainFacts.org 18 Dec 2013

Parkinson's Disease Psychosis -- Definitions

- DSM 5: Psychotic Disorder Due to Another Medical Condition
 - Prominent hallucinations or delusions
 - Pathophysiological evidence is direct consequence of a medical condition
 - Not better explained by other mental disorder or during a delirium
 - Disturbance causes significant distress or impairment in social, occupational or other areas of functioning
 - Specify if hallucinations or delusions are prominent

Parkinson's Disease Psychosis -- Hallucination

- Hallucination: abnormal perceptions without a physical stimulus that can involve any sensory modality and may be simple or complex in form
- Delusion: false, fixed idiosyncratic beliefs that are maintained despite evidence to the contrary
 - Parkinson's Disease: Visual hallucinations, well formed, of people or animal, reoccurring content, retained insight into the hallucinations, are not frightening, and may not require treatment
 - Parkinson's Disease Dementia or Dementia of the Lewy Body (DLB) Type: hallucinations and persecutory delusions (persecution, theft, phantom boarders, television characters in room, spousal infidelity), lack insight, find the hallucinations frightening, may have behavior changes (e.g. sundowning, agitation), and require treatment
 - Capgras' syndrome (delusional misidentification syndrome): occurs in DLB only



Neuropsychiatric Symptoms

Influence on cognition and the brain's interpretation of the world around it

- Anxiety
- Depression
- Psychosis



Health Promotion

Exercise, Social Support, Intellectual Stimulation



Exercise

Social Self Management

- Masking of the face limits the person's ability to communicate emotions and intentions to others
- Social networks play a crucial role to the overall well-being of those with chronic diseases
- 3 year study to examine social comfort while supporting physical and mental well-being for quality of life (Tickle-Degnen et al, 2014)



Body Language Shapes Who You Are

- TED talks: Social Psychologist Amy Cuddy PhD



Support Groups

Michael Rezak MD PhD
Chief, Neurosciences
Director of Movement Disorders

“Don’t let the Parkinson’s Disease
control you, control the Parkinson’s
Disease.”

Summary

1. Cognition and Parkinson's Disease
2. Neuropsychiatric symptoms in Parkinson's Disease
3. Health Promotion: Exercise, Social Support, Intellectual Stimulation