

**TOPIC:** Physical Therapy and Parkinson's: an Evidence Based Approach

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**LOCATION:** Willamalane Adult Activity Center. 215 West C. St., Springfield

**SPONSOR:** Parkinson's Alternative Support Group

## **LECTURE OUTLINE**

### **HISTORY**

- 1.) First described by James Parkinson, physician in London 1817
- 2.) Description: ".....involuntary tremulous motion, with lessened muscular power, in parts no in action and even when supported; with a propensity to bend the trunk forwards, and to pass from a walking to a running pace, the senses and intellects being uninjured." <sup>2</sup>
- 3.) Parkinson's (aka paralysis agitans....Disease of the basal ganglia)

### **SYMPTOMTOLOGY: quite variable.**

- 1.) Rhythmical tremor at rest
- 2.) Flexed "Stooped Posture"
- 3.) Unique increase in muscle tone or rigidity (i.e. "cogwheel" or "lead pipe" rigidity)
- 4.) Gait: Festinant or "Festinating Gait" (i.e. shuffling)
- 5.) Slowness in execution of movement (bradykinesia)
- 6.) Difficulty in initiation of movement
- 7.) Difficulty stopping gait: may only stop when come into contact w/ an object or a wall.
- 8.) Facial expression: "mask-like" w infrequent blinking and lack of expression.
- 9.) Decreased volume of speech
- 10.) Autonomic Nervous System changes (postural dizziness, excessive perspiration, greasy skin, heat sensations.
- 11.) Mental changes (25%) involving short term memory loss, problem solving (bradycognition), loss of enthusiasm, passivity, dependency.

### **BRAIN/CELLULAR DESCRIPTION**

- 1.) Substantia nigra: decreased secretion of Dopamine
- 2.) 1950's: 90% of dopamine is localized in basal ganglia (less than 0.5% of brain) (Arvid Carlsson)
- 3.) Decreased dopamine, norepinephrine and serotonin (Oleh Hornykiewicz)  
→ first disease associated with a deficiency of a specific neurotransmitter.  
Neurotransmitter (chemical transmission of information)
- 4.) This discovery stimulated search for neurotransmitter deficiencies in other disorders of the brain (i.e. depression, schizophrenia, dementia)
- 5.) L-DOPA - (Walter Birkmayer & Hornykiewicz) gave L-Dopa (L-3,4 hydroxyphenylalanine).  
Amino acid the precursor to dopamine (crosses blood brain barrier) dopamine does not.  
Observed brief periods of remission – new treatment. Initially hoped to solve, but did not.  
Helps control some of symptoms
- 6.) As many as 90% of the dopaminergic neurons degenerate.
- 7.) Treatment: Fetal cells
- 8.) Thalamotomy: reduces the tremor and rigidity, but no improvement in bradykinesia or gait.
- 9.) Pharmacology: all used to treat rigidity, bradykinesia, tremor, and depression.

### **PHYSICAL THERAPY**

- 1.) Parkinson's often not treated until advanced stage of disease or after sustaining hip fracture secondary to a fall.
- 2.) Primary purpose to reduce disabilities by improving the patient's ability to function.

### **PHYSICAL THERAPY EVALUATION**

- 1.) Identifying impairments that are a DIRECT RESULT OF A DISEASE.
  - a. Rigidity
  - b. Dyskinesia (tremor, choreiform movements)
  - c. Akinesia
  - d. Postural dysfunction/postural control problems/decreased awareness
  - e. Impaired motor program
- 2.) Impairments: musculoskeletal INDIRECT
  - a. muscle length –flexibility
  - b. joint mobility
- 3.) Impairments w/ multiple causes
  - a. Decreased Balance
  - b. Decreased Reaction Time
  - c. Difficulty combining more than 1 movement
  - d. Physical Disabilities:
    - i. Bed Mobility: unable to move in bed well
    - ii. Transfers: unable to safely sit to stand, supine to sit,
    - iii. Gait dysfunction
    - iv. Eating problems
    - v. Swallowing problems
    - vi. Speaking problems.
  - e. Bony Changes: Osteoporosis
  - f. Circulatory Changes: venous pooling

### **PHYSICAL THERAPY INTERVENTION**

- 1.) Relaxation techniques
- 2.) Breathing Exercises
- 3.) Manual Therapy: Restore joint mobility, muscle length
- 4.) ROM Exercise: Maintain & improve mobility achieved with manual therapy
- 5.) Weight Shifting Exercise
- 6.) Trunk mobility: lateral sidebending mobility CRITICAL for “righting reactions” in balance.
- 7.) Trunk mobility: respiratory/vital capacity
- 8.) Trunk mobility: rotation critical for power generation in locomotion, step length, & reciprocal arm swing
- 9.) Balance Responses
- 10.) Gait Activities
- 11.) Multi-joint Exercise due to rapid fatigue

### **REALISTIC GOAL SETTING**

- 1.) Temporary reduction in rigidity with relaxation techniques

### **CONCLUSION:**

Physical Therapy management in conjunction with pharmacologic management can provide the greatest possibility of maintaining functional ability as long as possible.<sup>4</sup>

### **REFERENCES:**

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