NR507NP Week 7 CNS: Sensory and Motor Disorders

NEURODEGENERATIVE DISORDERS

1. Neurodegenerative Disorders Affecting **Motor Function**
    a. **Parkinson's**: Loss of dopaminergic neurons leading to
        i. Tremors
        ii. Rigidity
        iii. Bradykinesia
        iv. **Pathophys:** Loss of dopaminergic neurons in substantia nigra pars compacta ◊ less dopamine ◊ symptoms.
            1. Lewy bodies form in substantia nigra ◊ further degeneration.
            2. Mitochondrial dysfunction ◊ neuronal damage and neuronal deficiencies.
            3. Inflammation from microglia activation ◊ cytokines ◊ degeneration.
        v. **Risk Factors:**
            1. Genetic (both autosomal dominant, and autosomal recessive)
            2. Environmental: Exposure to toxins (pesticides and heavy metals)
        vi. **CMs:**
            1. <u>Motor</u>
                a. Tremor ◊ "pill rolling" b/w thumb and fingers at rest.
                b. Bradykinesia ◊ Slowness
                c. Rigidity
                d. Postural Instability ◊ evaluate through "pull-test" (Romberg)
                e. Gait disturbance ◊ shuffling, reduced arm swinging
            2. <u>Non-motor</u>
                a. Cognitive impairment
                b. Mood disorders
                c. Sleep disturbances
                d. Autonomic dysfunction
                e. Sensory symptoms
                f. Speech/Swallowing difficulties
        vii. **Clinical Course**
            1. Prodromal (5-15yrs before diagnosis)
                a. Constipation, hyposomnia, sleep disorder, depression
            2. Clinical onset (1-5yrs)
                a. Tremors, rigid, bradykinesia
            3. Late stage (5-15yrs)
        viii. **Diagnosis**

1. History and Family Hx
2. Physical exam
3. Med challenge
    a. Levodopa ◊ improvement
4. Exclude other conditions
    a. Stroke, tumor, med-induced Parkinson's
5. Specialist referral

ix. **Treatment**

1. Meds
    a. Levodopa is converted to dopamine in brain and supplements reduced levels. Often combined with Carbidopa to reduce side effects.
    b. Dopamine agonists (Ropinerole) can mimic dopamine effects in brain.
    c. MAOI (selegiline) can help reduce breakdown of dopamine.
    d. Anticholinergics can help reduce tremor, but have side effects.
2. Deep Brain Stim ◊ reduces tremors
3. PT/ST
4. Alternative ◊ toga, tai-chi, meditation to COMPLIMENT treatment.

b. **Amyotrophic Lateral Sclerosis (ALS)**: Targets motor neurons in spinal cord and brain.
    i. Muscle weakness and atrophy
c. **Huntington's:** Degeneration of nerve cells in basal ganglia

i. Uncontrolled movements and emotional disturbances.

d. **Multiple Sclerosis:** Autoimmune disorder that damages the myelin sheath in CNS.
    i. Wide range of symptoms
e. **Myasthenia Gravis**: Autoimmune disorder that impacts communication between nerves and muscles.
    i. Muscle weakness and fatigue

2. Neurodegenerative Disorders Affecting **Cognitive Function** (types of dementia)
    a. **Alzheimer's:** Most common form that is marked by accumulation of amyloid plaques and tau tangles in brain ◊ neuronal death.
        i. Progressive memory loss
        ii. Confusion
        iii. Changes in behaviors/personality
        iv. **Pathophys** of Alzheimer's: accumulation of amyloid-beta plaques and tau protein tangles in brain, particularly in hippocampus and cortex.