Parkinson's Disease

Degeneration of the dopaminergic neurons in the substantia nigra (part of the basal ganglia) resulting in rigidity, tremor, bradykinesia and postural instability.

Clinical features – quadriad

- **Rigidity** - increased resistance to muscle stress (lead pipe rigidity); tone broken up by tremor (cogwheel rigidity); festinating gait
- **Tremor** - 4-6Hz; resting; pill-rolling
- **Bradykinesia** - slow shuffling gait with flexed trunk; slow monotonous speech; expressionless face; reduced blink rate; micrographia
- **Postural instability** - falls

Differential diagnosis of Parkinsonism

- Parkinson's disease
- Parkinson's plus syndromes
    - Multi-system atrophy (cerebellar signs; autonomic problems)
    - Progressive supranuclear palsy (vertical gaze palsy; axial rigidity)
    - Corticobulbar degeneration (apraxia; dementia; aphasia)
    - Lewy body dementia (dementia with some parkinsonian features)
- Other causes
    - Iatrogenic e.g. secondary to neuroleptic drugs
    - Wilson's disease
    - Communicating hydrocephalus
    - Supratentorial tumours

Investigation

Parkinson's disease is a clinical diagnosis – however, investigations may be required if the diagnosis is unclear

- MRI (to exclude rare secondary causes of parkinsonism)
- SPECT (to differentiate Parkinson's disease from other causes of tremor)
- Serum ceruloplasmin or 24 hour urinary copper excretion (to exclude Wilson's disease)

Management

<u>Pharmacological</u>

Low potency:

- **Monoamine oxidase B inhibitors** (e.g. selegiline)
    - For mild symptoms (no functional disability)

Moderate potency:

- **Dopamine agonists** (e.g. ropinirole, pramipexole)
    - For moderate symptoms (most at diagnosis)
    - Take several weeks to work
    - Notable side effects: sleep attacks, impulse control disorders

High potency:

- **Levodopa** (e.g. madopar, sinemet)
    - For severe symptoms/elderly
    - Given with peripheral decarboxylase inhibitor (e.g. carbidopa) to prevent peripheral conversion to dopamine
    - Notable side effects: *on-off/wearing off phenomenon* (switch between mobility and immobility that occurs before the next dose is due after prolonged levodopa use); dyskinesias

Adjuncts to levodopa:

- Monoamine oxidase B inhibitors - improve on time
- Entacapone (COMT inhibitor) - improve on time
- Apomorphine (subcutaneous) - for motor fluctuations
- Amantadine (glutamate antagonist) - reduces dyskinesia

<u>Non-pharmacological</u>

- Multidisciplinary approach: neurologist, physiotherapist, occupational therapist, specialist nurse, GP, speech and language therapist
- Supervised exercise
- Home modifications
- Consider associated conditions: dementia, depression, psychosis, sleep disturbance