Recent Trends in Parkinsonism Treatment

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Outline

• Introduction
• History
• Epidemiology
• Symptoms
• Risk Factors
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Parkinson's Awareness
Introduction

- Parkinsonism is a neurodegenerative disease
- Classified as a motor movement disorder
- Caused by a decrease in the neurotransmitter
  
  *Dopamine* or an excess of ACh.
History

- Parkinsonism or Parkinson's disease named after English apothecary James Parkinson, who made a detailed description of the disease in his essay: "An Essay on the Shaking Palsy" (1817)
- Interestingly, an earlier description was made by Leonardo da Vinci.
Epidemiology

• There is a large variety of different prevalence rates for PD across the globe.
• However some trends are observed such as a lower incidence in Africa and Asia.
Epidemiology

- Libya (Benghazi) has a low prevalence rate of PD (31.4/100,000).
- Egypt has a much higher prevalence rate of 102/100,000.
Symptoms of Parkinsonism

• Primarily divided into primary and secondary
• Primary symptoms are TRAP
  – Tremors
  – Rigidity
  – Akinesia
  – Postural Instability
Symptoms of Parkinsonism

- Secondary symptoms include
  - Constipation
  - Micrographia
  - Microphonia
  - Masked face
  - Dysphagia
  - Dimentia
Risk Factors

• The vast majority of Parkinsonism cases are idiopathic (are of unknown cause).
• However there are a few predisposing factors such as:
  • Age, Gender, Vitamins
  • Genetics
  • Trauma
Treatment of Parkinson's Disease

Recent Trends in Treatment

Conventional Treatments

Thalamotomy

Pallidotomy

Deep Brain Stimulation

Stem Cells

Neuroprotective Treatment
L-Dopa

- Probably, the best known treatment is L-dopa (Levodopa).
- This drug works by giving the precursor of dopamine whose lack causes Parkinson’s disease.
- It crosses the BBB and enters the brain to be converted to dopamine.
L-Dopa Metabolism

- **AADC**
  - L-Dopa
  - Dopamine

- **COMT**
  - 3-O-methyldopa

** BBB 

- **MAO**
  - 3,4-dihydroxy-phenylacetic acid
  - Dopamine

- **COMT**
  - 3-methoxytyramine
  - homovanillic acid
L-Dopa

- While levodopa is useful in the treatment of the symptoms of Parkinsonism, there are various side-effects.
- First of all, of the amount administered, only 1-5% actually reaches the brain. The rest is metabolized in other locations producing side effects. (Hence given with Carbidopa)
- Also, after prolonged use, L-dopa produces inhibition for the body’s endogenous L-dopa and hence worsens Parkinson’s.
L-Dopa

- Levodopa also exhibits the **ON-OFF** phenomenon in which patients under the effect of the drug, suddenly lose control of their movements (PD movements).
- It lasted for minutes up to two hours.
- Then they would regain control again.
D2-Agonists

• Dopamine Agonists are also used such as ropinirole, piribedil, cabergoline and apomorphine.
• Moderately effective however same problem as L-dopa in that there is peripheral metabolism of the drug.
• Also prolonged use of DA agonists $\rightarrow$ decreased sensitivity of the receptors $\rightarrow$ aggravate PD