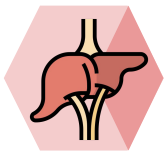
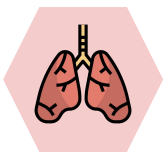
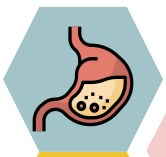
Medicine
TEAM 437

MED437
KING SAUD UNIVERSITY

Movement Disorders and Parkinsonism


Objectives :

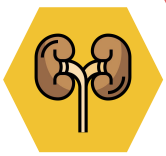
- Not found

Worked on this lecture:

Team Leader: AlHanouf AlJaloud
Team Members: Alfahdah Alsaleem, Hussien Alami, Khaled Alsmari, Rotana Khateeb


Resources :

Doctors Slides + Notes: Dr. Taim Almuaygil
Books: Step up




Abnormality of Movement(types):

Hyperkinetic:

Chorea

Involuntary movements resulting from a continuous flow of **random** muscle contractions. You can't predict what is the next movement
Types of chores: Sydenham's Chorea and Huntington's disease.

Dystonia

is a movement disorder characterized by **sustained or intermittent** muscle contractions causing abnormal, often repetitive, movements, postures, or both.
Pattern movement it could be painful because there are contractions of **agonist and antagonist muscles.**

Myoclonus

Involuntary **single** quick contraction of a **muscle group** (or its inhibition)
can be repeated but not rhythmic.
seen during encephalopathies or drug related, hereditary disorders Could be focal (limb or leg) or Generalized.

Tremor

Involuntary **rhythmic oscillatory** movement around a joint axis
Involuntary rhythmic (that's what differentiates between it & myoclonus) oscillatory movement around a joint axis, it's the most common of all involuntary movements.

Hypokinetic:

Bradykinesia

Slowness of initiation with progressive reduction in speed and amplitude of repetitive action.
(Involuntary slowness of movement).
Characteristic of parkinson's

Rigidity

Abnormally increased resistance to movement that is **independent of the velocity** of the movement.
Extrapyramidal While spasticity is velocity dependent, so when you move the hand fast you will get resistance at the end.

Parkinsonism and parkinson's disease

- **Parkinsonism**: (Parkinsonism is NOT parkinson disease)
  - Features of rigidity, bradykinesia, rest tremor.

- **Parkinson's Disease:**
  - The most common condition to present with parkinsonism
  - **Core features of Parkinson's disease:**
    - Rigidity "Cogwheel rigidity", bradykinesia "of voluntary movement", rest tremor "Pill-rolling" +/- Postural instability Difficulty initiating first step, shuffling gait.
  - PD occurs due to the loss of **substantia nigra dopamine releasing neurons**
  - Typically starts at one side of the body then progress to the other.
  - Hypokinetic
  - Onset typically after 50

- **Parkinsonian Tremor:**
  - 4-6 Hz
  - Predominantly at rest tremor mainly noticed while walking **"shuffling gait"**
  - Re-emergence with maintained posture appears after a while from disease onset
  - Increases with mental concentration like when you ask them a question

- **Non-motor symptoms Seen in Parkinson's Disease:**
  - REMBD
    - sleep behavior disorder ; Lesy body dementia; when you lose the ability to inhibit your movement during dream phase of sleep.
  - Anosmia
    - the olfactory bulb is one of the first structures to be affected.
  - Hallucinations
    - visual hallucinations
  - Autonomic dysfunction
    - Can lead to orthostatic hypotension, incontinence, erectile dysfunction, constipation, increased sweating and oily skin.
  - Depression/anxiety

All these above might happen even before the appearance of parkinsonian symptoms

  - Cognitive impairment
    - Happens later on, if it happened early at the start with parkinsonism (within 1 year) that means it is LBD. But, if he have parkinson disease for 1 or 2 years & then cognitive problems start then it's probably parkinson disease dementia

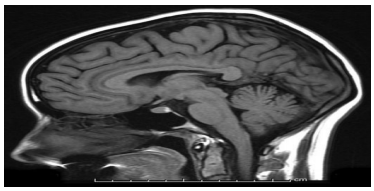
Parkinson plus syndromes Disorders that mimic Parkinson's disease

All these patients will have parkinsonism plus some other features "hence the name" but they are not PD

- **Progressive Supranuclear Gaze Palsy:**
  - Impaired vertical gaze they can't look up or down.
- **Multiple System Atrophy:**
  - Involvement of other neurological systems (cerebellar signs ataxia, wide base gait or, **severe autonomic** dysfunction, or Dystonia) rapidly progress (in a year)
- **Vascular Parkinsonism:**
  - Upper motor neuron signs
- **Corticobasal degeneration.** Corticobasal Impairment (Cognition, dystonia, sensory, myoclonus)
  - Sensory:
    - **Astereognosis:** The inability to identify an object by touch. You give the pt a key while his eyes are closed & ask him to recognize what is it.
    - **Agraphesthesia:** Draw a number or a letter on the pt hand the he won't be able to tell that it.
    - **Apraxia:** Loss of a learned skill without any weakness or sensory loss. E.g Patient forgot how to brush his teeth.
- **Drug induced Parkinsonism**
  - (ALWAYS ask about medication history, eg: **metoclopramide** and **neuroleptics**).

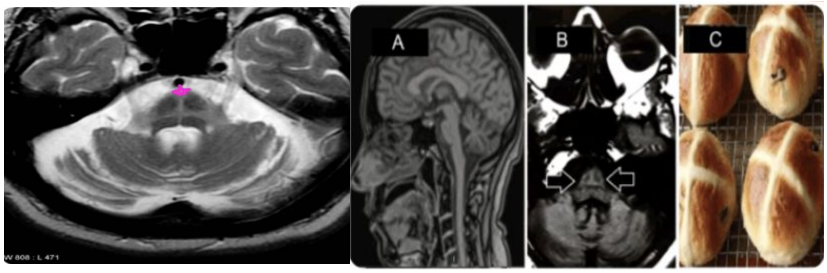
Investigations

Investigations and Imaging is normal in typical PD
Diagnosis is clinical

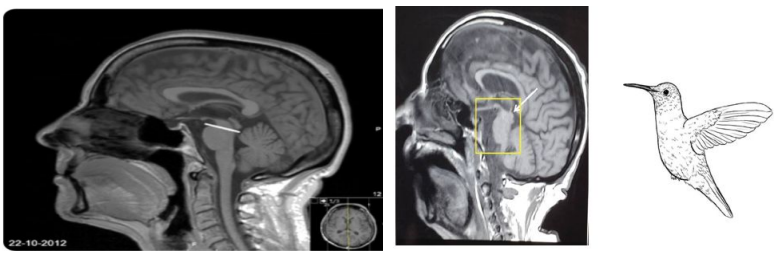


Images of multiple systemic atrophy showing:

1. Enlargement of cerebellar pathway
2. Cross bun sign

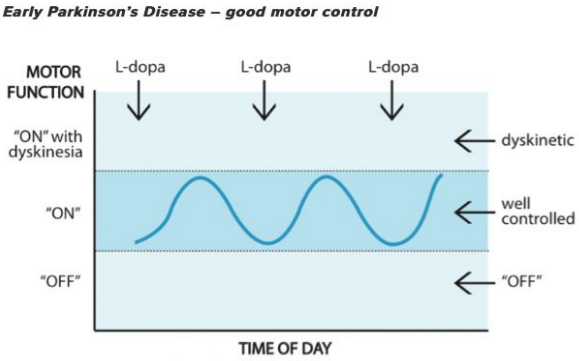


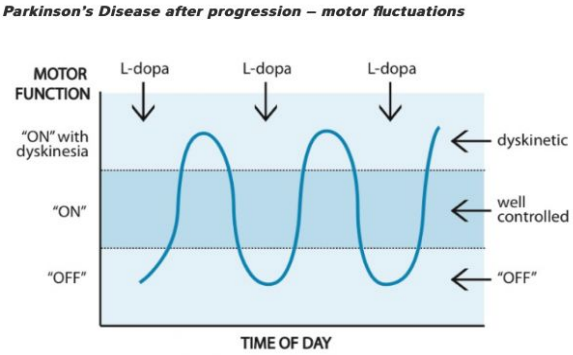
Hummingbird sign (progressive supranuclear gaze palsy)



Management of PD:

- **Levodopa**/Carbidopa (LD/CD)
  - **DRUG OF CHOICE** for treating parkinsonian symptoms. Levodopa replace the missing dopamine, carbidopa & MAO B inhibitors keep Levodopa longer in the blood so both don't have any action by themselves but you add it to Levodopa (prevents the breakdown of levodopa in the bloodstream).
  - Dyskinesia is a major side effect later on.
- Dopamine agonists (Pramipexole, rotigotine)
- MAO B inhibitor (Selegiline, rasagiline)
- COMT inhibitors (Entacapone)-Prolongs activity of LD in blood
- Deep brain Stimulation-Used in (LD/CD responsive patients)
  - It is a surgical procedure (while pt is awake) they implant a device & it changes the tremor response. Done in advanced cases of parkinsonism. But you don't stop the drugs.
- Anticholinergic can help with the Dystonia





At the beginning of the disease the L- dopa levels are within the blue zone "the middle" and the disease is well controlled.

As the disease progress the absorption will change and the levels of L-dopa will fluctuate " after 5-7 years of treatment" leading to dyskinesia "excessive movement" And on-Off Phenomena.

Red Flags: <u>If present suspect condition other than PD</u>

1. Neuroleptic or anti-emetic drug use.
2. Early/prominent autonomic dysfunction.
3. Limited eye movements.
4. Pyramidal, cerebellar or sensory symptoms multisystem atrophy or stroke.
5. Cognitive impairment or signs of higher cortical dysfunction if the cognitive impairment is early think of **Lewy body dementia.**

Essential Tremor:

Most common movement disorder

What is it?

- Hereditary, autosomal dominant

Character?

- Slowly progressive action tremor, disappears at rest with no Parkinson's symptoms

Worse with?

- physical activity, caffeine, stress

Relieved by ?

- May temporarily improve after **alcoholic beverages**

Treatment?

- **Propranolol**

Action "Intention" tremor**:**

- tremor when the pt move his hand.
- Associated with cerebellar dysfunction,

Rest tremor:

- While the pt is resting
- Associated with basal ganglia dysfunction.

Other Disorders:

1. **Chorea**
   a. can occur in "Sydenham's Chorea" and in Huntington's disease (HD). HD is an autosomal dominant disorder with progressive chorea, cognitive impairment and psychiatric features develop.
2. **Dystonia**
   a. Could be generalized or focal, could be lesional, drug or idiopathic
3. **Ballismus:**
   a. A large amplitude choreiform movement, seen after subthalamic strokes usually

Summary

- **Parkinsonism**: (Parkinsonism is NOT parkinson disease)
  - Features of rigidity, bradykinesia, rest tremor.
- **Parkinson's disease:**
- Occurs due to the loss of substantia nigra dopamine releasing neurons.

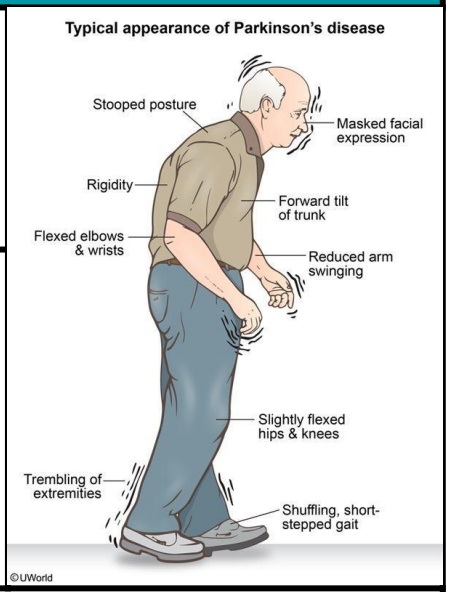
Clinical features

Motor symptoms:

- Resting tremor
- Bradykinesia
- Rigidity
- Postural instability

Non-Motor symptoms:

- REMBD
- Anosmia
- Autonomic dysfunction
- Cognitive impairment
- Hallucinations
- Depression



Investigations

- Diagnosis is **clinical**
- Investigations and Imaging is **normal** in typical PD

Management

- Levodopa/Carbidopa (Drugs of choice)
- Dopamine agonists (Pramipexole, rotigotine)
- MAO B inhibitor (Selegiline, rasagiline)
- COMT inhibitors (Entacapone)
- Deep brain Stimulation

Questions

1. In essential tremors the person will have?
A.Tremor + Bradykinesia
B.Tremor + Rigidity
C.Only tremor
D.Tremor + Bradykinesia + Rigidity

2. Patient came with resting tremor, bradykinesia and the physician diagnosed him with Parkinson's. Which of the following symptoms he would most likely have?
A.Seizures
B.Anosmia
C.Essential tremot
D.None of the above

3. Which of the following is the main neurotransmitter deficient in Parkinson's?
A.Acetylcholine
B.Dopamine
C.Glutamate
D.GABA

4. Which of the following are the drugs of choice in Parkinson's?
A.Levodopa/Entacapone
B.Bromocriptine/Carbidopa
C.Pramipexole/Carbidopa
D.Levodopa/Carbidopa

5.Which of the following drugs can cause drug-induced Parkinson?
A.Benztropine
B.Amitriptyline
C.Metoclopramide
D.Entacapone

6.What is the drug of choice in a newly diagnosed parkinson's patient?
A.MAO inhibitor
B. TCA
C. Levodopa
D.Pramipexole

7.You diagnosed a 53 years old male with Parkinson's. Which of the following structures is first to be affected?
A.Spinal tract
B.Olfactory bulb
C.Optic chiasm
D.Cerebral cortex

8.Which of the following will make you reconsider the diagnosis of parkinson's?
A.Shuffling gait
B.Early autonomic dysfunction
C.Blank face
D.Old age

Answers: 1-C 2-B 3-B 4-D 5-C 6-D 7-B 8-B