

Parkinson's disease

Definition

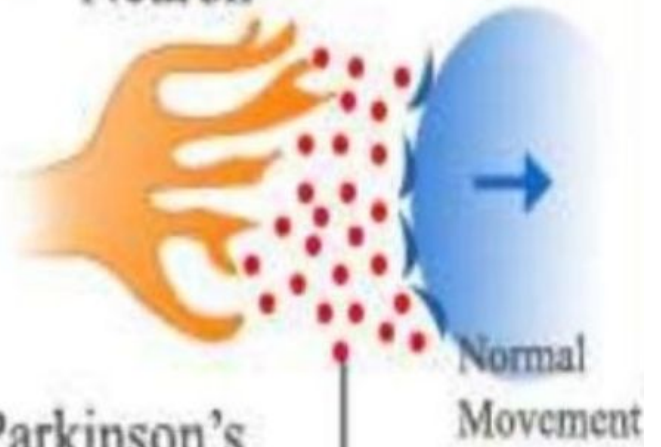
- Parkinson's disease is a progressive disorder of the nervous system that affects movement. It develops gradually, sometimes starting with a barely noticeable tremor in just one hand. But while a tremor may be the most well-known sign of Parkinson's disease, the disorder also commonly causes stiffness or slowing of movement.

PARKINSON'S DISEASE

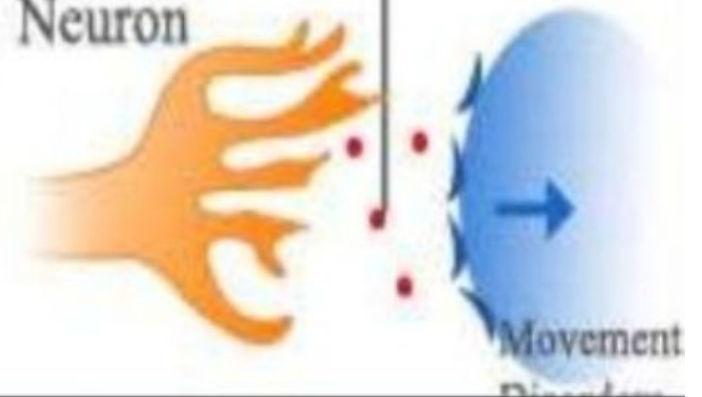


Substantia Nigra

Normal Neuron



Parkinson's Affected Neuron



Dopamine

Signs and symptoms

- Tremor.
- Slowed movement (bradykinesia)
- Rigid muscles.
- Impaired posture and balance.
- Loss of automatic movements.
- Speech changes.
- Writing changes.

Typical appearance of Parkinson's disease



Causes

- The cause of Parkinson's disease is unknown, but several factors appear to play a role, including:
- **Your genes.** Researchers have identified specific genetic mutations that can cause Parkinson's disease, but these are uncommon except in rare cases with many family members affected by Parkinson's disease.

Causes

- **Environmental triggers.** Exposure to certain toxins or environmental factors may increase the risk of later Parkinson's disease, but the risk is relatively small.
- **The presence of Lewy bodies.** Clumps of specific substances within brain cells are microscopic markers of Parkinson's disease. These are called Lewy bodies, and researchers believe these Lewy bodies hold an important clue to the cause of Parkinson's disease.

Risk factors

- **Age.** People usually develop the disease around age 60 or older.
- **Heredity.** Having a close relative with Parkinson's disease increases the chances that you'll develop the disease.
- **Sex.** Men are more likely to develop Parkinson's disease than are women
- **Exposure to toxins.**

Additional problems

- Thinking difficulties.
- Depression and emotional changes.
- Swallowing problems.
- Sleep problems and sleep disorders.
- Blood pressure changes.
- Smell dysfunction
- Fatigue.

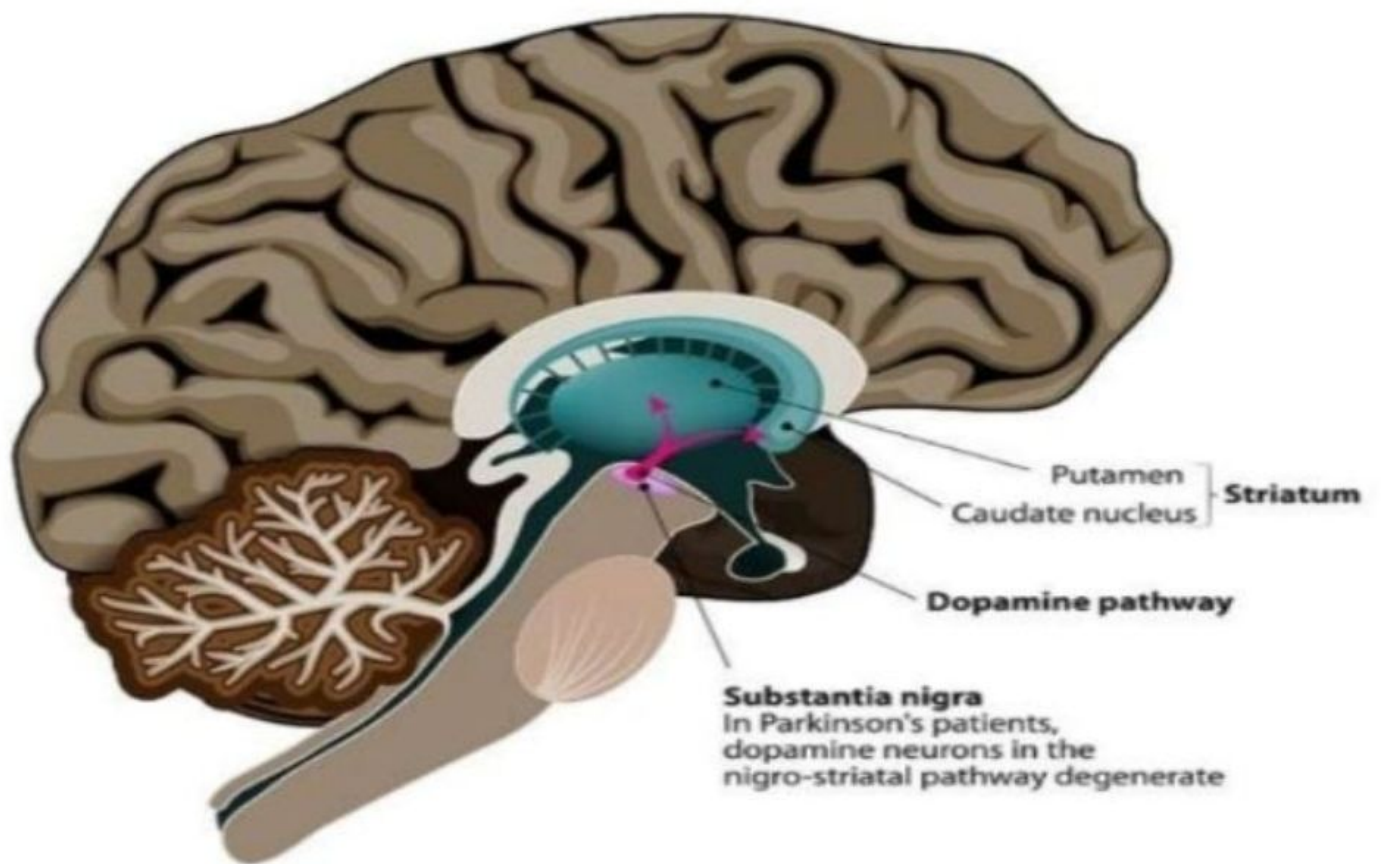
Pathophysiology

- Parkinson's disease is primarily associated with the gradual loss of cells in the substantia nigra of the brain. This area is responsible for the production of dopamine. Dopamine is a chemical messenger that transmits signals between two regions of the brain to coordinate activity. For example, it connects the substantia nigra and the corpus striatum to regulate muscle activity. If there is deficiency of dopamine in the striatum the nerve cells in this region "fire" out of control. This leaves the individual unable to direct or control movements.

Pathophysiology

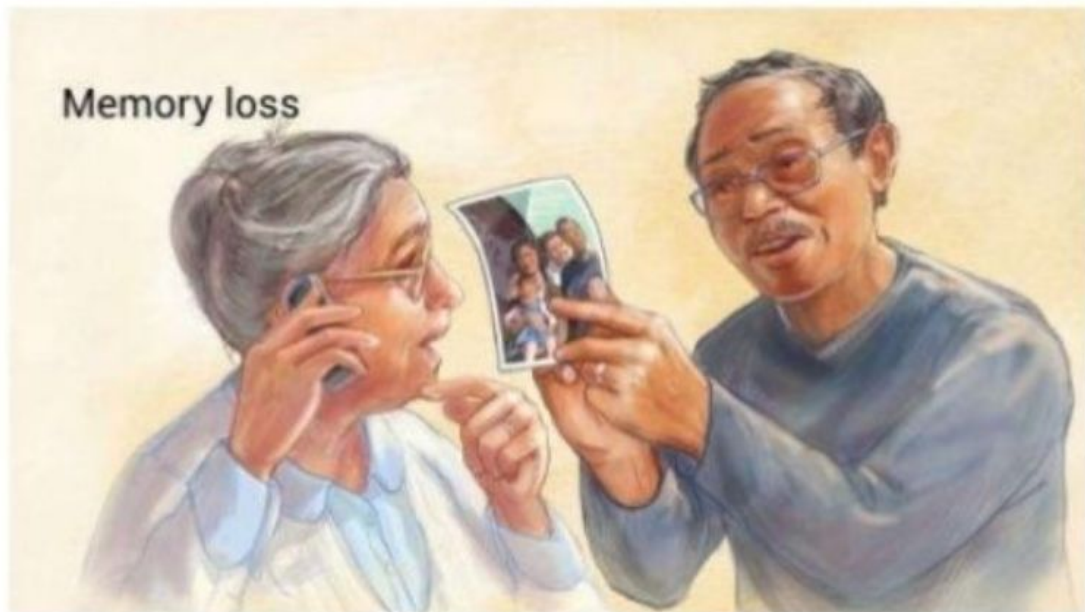
- . This leads to the initial symptoms of Parkinson's disease. As the nervous system degenerate as well causing a more profound movement disorder

PARKINSON'S DISEASE



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ALZEIMER'S DISEASE



Introduction

Alzheimer disease (AD) is the most common cause of dementia in the elderly population. The disease usually manifests with the insidious onset of impaired higher intellectual function and altered mood and behavior.

Later, this progresses to disorientation, memory loss, and aphasia, findings indicative of severe cortical dysfunction, and over another 5 to 10 years, the patient becomes profoundly disabled, mute, and immobile.

AD is characterized by a progressive decline in cognitive function. AD is substantially increased among people aged 65 years or more, with a progressive decline in memory, thinking, language and learning capacity. AD should be differentiated from normal age-related decline in cognitive function, which is more gradual and associated with less disability. Disease often starts with mild symptoms and ends with severe brain damage. People with dementia lose their abilities at different rates

CAUSES:

Alzheimer's disease is caused by a combination of genetic, lifestyle and environmental factors that affect the brain over time.

Less than 1 percent of the time, Alzheimer's is caused by specific genetic changes that virtually guarantee a person will develop the disease. These rare occurrences usually result in disease onset in middle age.

The exact causes of Alzheimer's disease aren't fully understood, but at its core are problems with brain proteins that fail to function normally, disrupt the work of brain cells (neurons) and unleash a series of toxic events. Neurons are damaged, lose connections to each other and eventually die.

The damage most often starts in the region of the brain that controls memory, but the process begins years before the first symptoms. The loss of neurons spreads in a somewhat predictable pattern to other regions of the brains. By the late stage of the disease, the brain has shrunk significantly.

CAUSES⁽³⁾

DPU

- APOE e4
- PSEN 1
- PSEN 2
- TRISOMY 21

GENETIC



- PHYSICAL
- MENTAL
- STRESS
- SLEEP- WAKE CYCLES

LIFE-
STYLE



- HEAVY METALS
- PESTICIDES
- AIR POLLUTION

ENVIORN-
MENTAL



SIGN & SYMPTOMS⁽³⁾

DPU



Signs & Symptoms:

- Memory loss for recent events
- Progresses into dementia → almost total memory loss
- Inability to converse, loss of language ability
- Affective/personality disturbance
- Death from opportunistic infections, etc.

- Pathophysiology of AD is not clear.
 - Three pathogenic AD hypothesis are discussed below-
- 1. Cholinergic hypothesis.**
 - 2. The amyloid plaques hypothesis.**
 - 3. The tau protein neurofibrillary tangles hypothesis.**

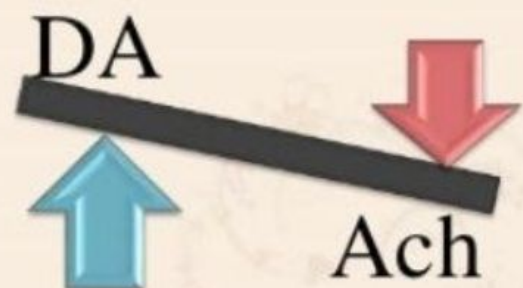
Ctd...

DPU

1. **CHOLINERGIC HYPOTHESIS:-** Low level of Ach in brain leads to AD that results in loss of memory.



Normal



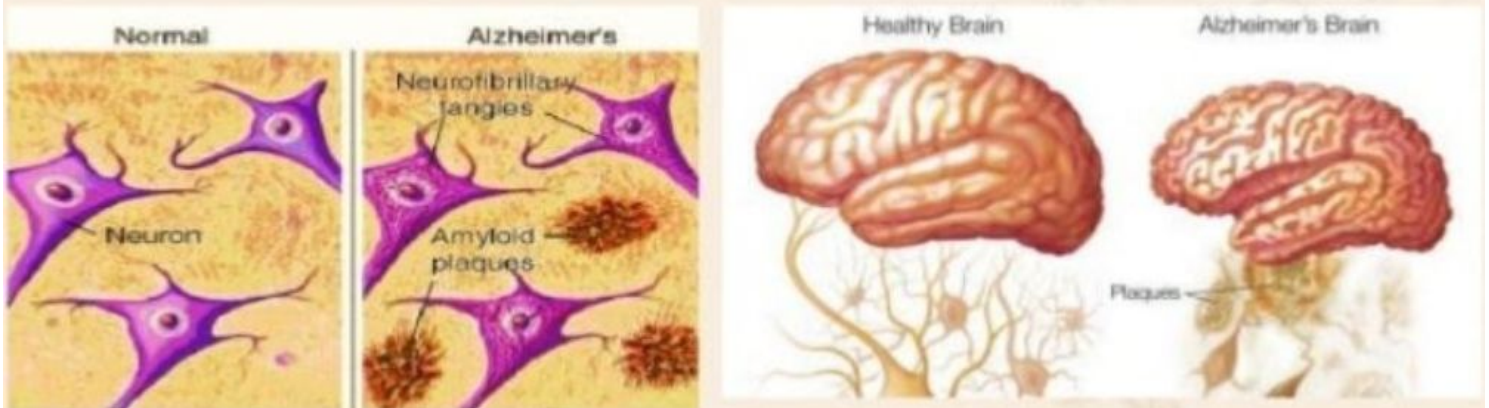
Alzheimer's
Disease

Ctd...

DPU

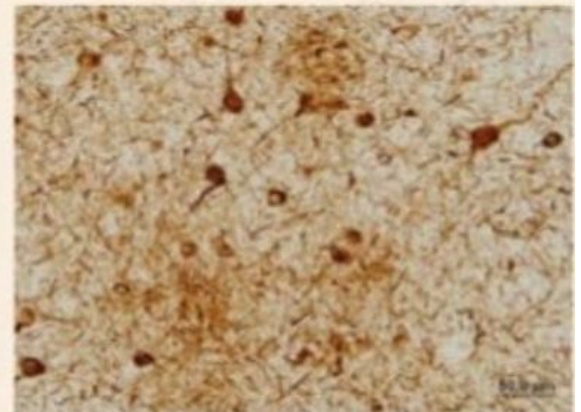
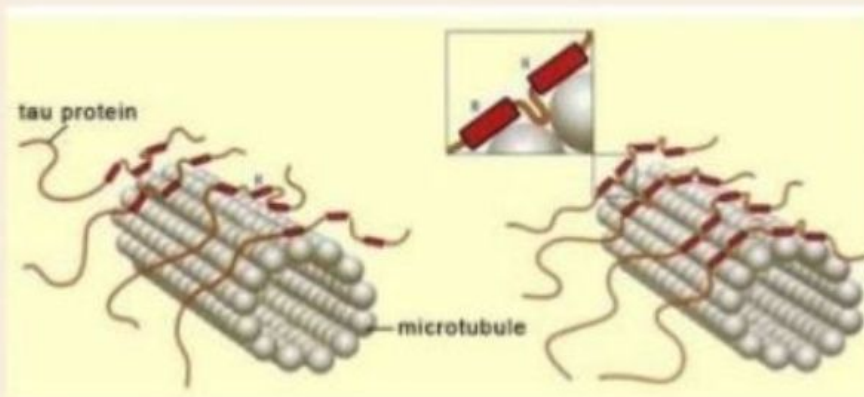
2. The Amyloid plaques :-

- Beta secretase enzyme degrade the APP which are sticky in nature.
- They combined with each other and form insoluble plaques between neurons.
- That leads to impairment in neuronal chemical transmission.



3. Neurofibrillary tangles:-

- Tau protein stabilizes the microtubule from which chemical messengers move.
- Degeneration of this protein causes destabilization of microtubule.
- Chemical messengers fail to transmit the signal.



RISK FACTORS⁽³⁾

DPU



Family history and Genetics



Age & Sex



Mild Cognitive Impairment



Past Head trauma & Down syndrome



Life style and Heart health



Life long learning and Social engagement

Risk Factors

- **Age**

- Primary risk factor for Alzheimer's disease. The number of cases of Alzheimer's disease doubles every 5 years beyond age 65.
- According to the U.S. Alzheimer's Association, 1 in 8 people age 65 and older have Alzheimer's disease. About 6% of people age 65 to 74 have Alzheimer's and nearly half (45%) of people age 85 years and older have the disease.
- While less common, Alzheimer's can also affect younger people. About 200,000 Americans younger than age 65 have early-onset Alzheimer's disease.

- **Gender**

More women than men develop Alzheimer's disease but this is most likely because women tend to live longer than men.

- **Race and Ethnicity**

- African Americans and Hispanics are at greater risk for developing Alzheimer's disease than whites.

- This may be in part because they have a higher prevalence of medical conditions such as high blood pressure and diabetes, which are associated with increased risk for Alzheimer's.

Risk Factors

- **Family History**

People with a family history of Alzheimer's are at higher than average risk for the disease.

- **Heart and Vascular Diseases**

COMPLICATIONS⁽³⁾

DPU

- Inhaling food or liquid into the lungs (aspiration)
- Pneumonia and other infections
- Falls
- Fractures
- Bedsores
- Malnutrition or dehydration