



Parkinson's Disease

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Why in News?

A recent research has proposed a significant shift in understanding [Parkinson's Disease \(PD\)](#) through the "**gut-first hypothesis**", suggesting a gut-brain connection in its onset and progression.

- The research is significant as it may shift the understanding of the diagnosis, development and treatment of this neurodegenerative disorder.

What are the Key Points of Research?

- The "**gut-first hypothesis**" suggests that PD may begin in the gut, with implications for understanding disease progression and therapeutic strategies.
 - The [gut microbiome](#) spans from the mouth to the colon. It is the network of microorganisms — bacteria, viruses, fungi and more — and their collective genetic material that lives within the intestinal tract.
 - The research identifies gastrointestinal symptoms, like constipation, as early signs of PD, potentially reshaping diagnosis and treatment approaches.
- Abnormal protein aggregates (Lewy bodies) linked to PD are found in both the gut and brain, indicating a complex interplay in disease development.
 - Lewy bodies are primarily composed of alpha-synuclein, a protein that misfolds and clumps together, contributing to the death of dopamine-producing neurons in the brain.

What is Parkinson's Disease?

- **About:** Parkinson's Disease (PD) is a progressive [neurodegenerative disorder](#) marked by motor symptoms like tremors, rigidity, **bradykinesia (slow movement)**, and postural instability. Non-motor symptoms include cognitive issues, mental health disorders, sleep disturbances, pain, and sensory problems.
 - **Bradykinesia** means slowness of movement and speed (or progressive hesitations/halts) as movements are continued.
- **Causes:** The exact cause of Parkinson's disease is not fully known yet, but it is believed to involve a combination of genetic and environmental factors.
 - It is primarily characterised by the loss of dopamine-producing neurons in the brain, leading to motor and non-motor symptoms.
- **Prevalence:** The global prevalence of PD has doubled in the past 25 years. Global estimates in 2019 showed over 8.5 million individuals with PD.
 - **Every year, 13th April is observed as World Parkinson's Day.**
- **Treatment:** There is no cure for Parkinson disease, but therapies including medicines, surgery and rehabilitation can reduce symptoms.
 - **Levodopa/carbidopa**, a combination medicine that increases the amount of dopamine in the brain, is the most common medication.

What are Neurodegenerative Disorders?

▪ **About:**

- Neurodegenerative diseases are conditions that gradually damage and destroy parts of the nervous system, especially areas of the brain.

▪ **Types:**

- **Dementia-type diseases:** These cause progressive damage to various areas of your brain, causing neurons in several areas of your brain to die. For example, [Alzheimer's disease](#), frontotemporal dementia, chronic traumatic encephalopathy (CTE), Lewy body dementia.
- **Parkinsonism-type diseases:** It results from damage to specific brain neurons responsible for coordination and muscle control, including Parkinson's disease and similar conditions.
- **Motor neuron diseases:** These happen when neurons that control movement die off. Examples include **amyotrophic lateral sclerosis**.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims:

Q. Consider the following statements

1. Genetic changes can be introduced in the cells that produce eggs or sperm of a prospective parent.
2. A person's genome can be edited before birth at the early embryonic stage.
3. Human induced pluripotent stem cells can be injected into the embryo of a pig.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 and 3 only
- (c) 2 only
- (d) 1, 2 and 3

Ans: (d)

Q. Which one of the following statements best describes the role of B cells and T cells in the human body? (2022)

- (a) They protect the body from environmental allergens.
- (b) They alleviate the body's pain and inflammation.
- (c) They act as immunosuppressants in the body.
- (d) They protect the body from diseases caused by pathogens.

Ans: (d)

