

PHARMA HEALTH CLUB

SAFE USE OF MEDICINES FOR BETTER HEALTH

1ST APRIL, 2016

Page 01

About World Parkinson's Day

Page 02

Diagnose Parkinson's Disease

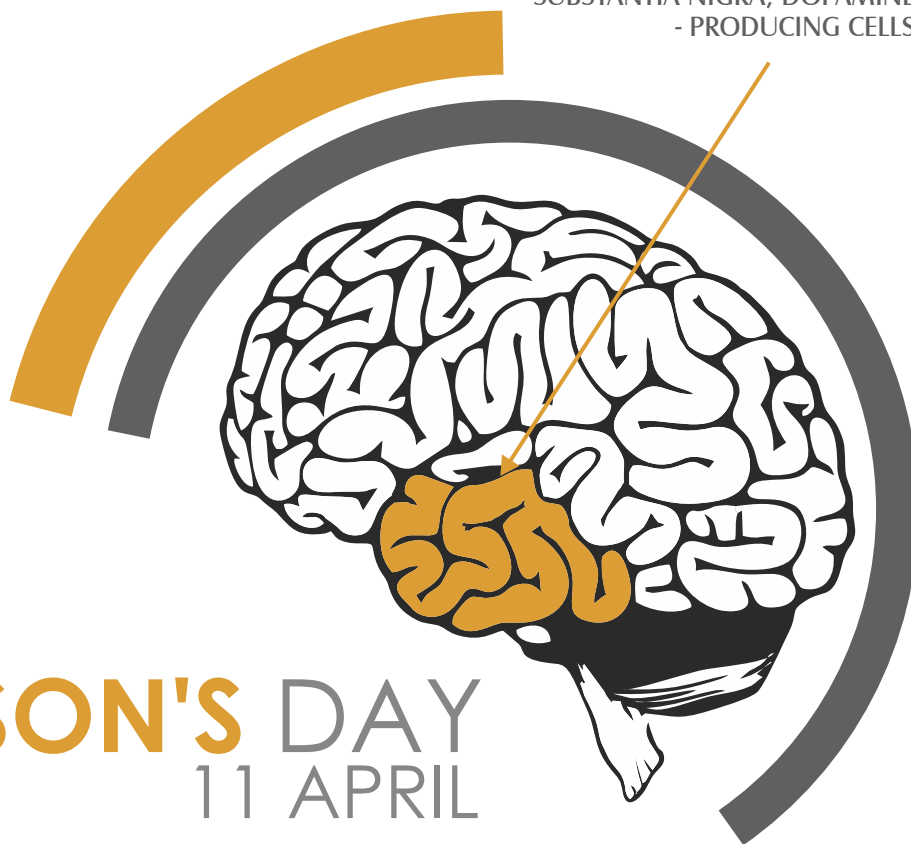
Page 03

Recent Advances For PD Management

Page 04

References

SUBSTANTIA NIGRA, DOPAMINE - PRODUCING CELLS



WORLD PARKINSON'S DAY

11 APRIL

World Parkinson's Day is observed every year on April 11, marking the birthday of Dr. James Parkinson, the English physician who first described the symptoms of the disease in his work titled "An Essay on the Shaking Palsy". Parkinson's is a progressive brain disease for which there is no cure. Over 6 million people world-wide have Parkinson's. [1] In Gujarati, Parkinson's disease is referred as "Kampva". World Parkinson's Day is celebrated to raise awareness of Parkinson's disease and how it effects on individuals, families and the wider spectrum of community. Greater awareness will cut down the stigma associated with the disease, enhanced community understanding and awareness will lead to better quality of life for those suffering with the condition.[2]

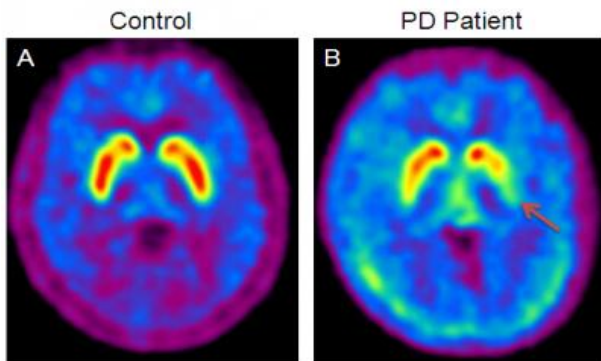
What is Parkinson's Disease?

A progressive disease of the nervous system marked by tremor, muscular rigidity, and slow, imprecise movement, chiefly affecting middle-aged and elderly people. thinking and behavioral problems may arise, with dementia commonly occurring in the advanced stages of the disease, and depression being the most common psychiatric symptom. Other symptoms include sensory, sleep, and emotional problems. The main motor symptoms are collectively called "Parkinsonism", or a "Parkinsonian syndrome". [3] It is associated with degeneration of the basal ganglia of the brain and a deficiency of the neurotransmitter dopamine.[3]

What are the symptoms of Parkinson's Disease?

There are four major symptoms which are as follows:

- Tremors: Due to increased ACh level; Tremors are present at resting state while present at active state
- Rigidity: Stiffness of muscle leads to difficulty in performing routine works. Ex.: can't get proper grip on tooth brush!!!



- Akinesia (Bradykinesia): Brady means 'decreased', kinesia means 'movement' - Akinesia or bradykinesia means decreased voluntary movement of SKM. Ex.: The patient touches his cheeks or lips when asked to touch his nose!!!
- Postural instability: The person feels difficulty in maintaining posture... There are some minor symptoms which are Dementia, Dystonia, Ophthalmoplegia, etc...

How to diagnose Parkinson's Disease?

- PET (Positron Emission Tomography):
 - » Can be useful for all neurodegenerative diseases

» For Parkinsonism: In it, the radioactive compound (Fluorodopa) is given which will be located at a specific area & due to radioactivity it will produce an image of a particular area from which the diagnosis is made.

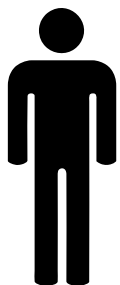
- **UPDRS** (United Parkinson's Disease Rating Scale - Based on severity of symptoms)

How to treat Parkinson's Disease?

Pharmacological aspects: Drugs used to treat PD include L-Dopa combined with Carbidopa or Benserazide, non-Ergot dopamine agonists (Pramipexole and Ropinirole), selective MAO-B inhibitors (Selegiline), NMDA antagonist (Amantadine) and anticholinergic agents (Benzhexole).

Non-Pharmacological aspects:

- **Physiotherapy:** The symptoms of Parkinson's disease may cause you to move more slowly. You may also feel tightness, pain, and weakness, especially in the muscles and joints. Physical and occupational therapy may help with these symptoms.[6] Dr. Priyanshu Rathod, Director, School of Physiotherapy, RK University, shares his expertise: "Physiotherapy plays a vital role in improving functional performance and Quality of Life. It helps to delay early complications, prevents use of higher dose of L-dopa and extends the "happy hours" of patients, normally 2-4 hours after L-dopa dosage". For helping people with Parkinson's disease, a Parkinson's Disease Support Group (PDSG) is functioning since 2011 at RK Physiotherapy and Rehabilitation Research Center, Rajkot, managed by School of Physiotherapy, RKU, with almost 100 members who meet on the first Saturday of every month.



52%
Are Male



48%
Are Female

OVER
12000
ARE WORKING
AGE

OVER
2000
ARE IN
THEIR
30S & 40S

OVER
80%
ARE OVER
65 YRS

OVER
30 PPL
ARE OVER
65 YRS

OVER
100000
AUSTRALIANS
HAVE PD

OVER
10500
NEW CASES
EACH YR

- **Speech Therapy:** Dysarthria (difficulty speaking) and dysphagia (difficulty swallowing) can be severely limiting symptoms of Parkinson's disease. Both can be helped by seeing a speech pathologist or speech therapist.[6]
- **Gamma Knife Treatment:** The Gamma knife is a machine that emits hundreds of powerful, highly focused gamma radiation beams. It allows for a more precise and concentrated treatment than do other radiation treatment options. [6]
- **Exercise:** Exercise your facial muscles, jaw, and voice when possible. Sing or read aloud, exaggerating your lip movements. Make faces in the mirror. Chew food vigorously; Try water exercise, such as water aerobics or swimming laps. [7]Physiotherapy can help a lot to manage the symptoms of PD.

Useful herbs/herbal medicines:[8, 12-14]

» Kaucha: Increases dopamine levels.

» Brahmi:Increases synthesis of cerebral proteins.



Black Kaucha

White Kaucha

Gotukola Brahmi

Surgical aspects:

Deep Brain stimulation technique: It is used to manage Parkinson's Disease. Deep brain stimulation (or DBS) is a way to inactivate parts of the brain that cause Parkinson's disease and its associated symptoms without purposefully destroying the brain.[6, 10]

Recent Advances for PD Management:

• Gene therapy:

It typically involves the use of a non-infectious virus (i.e., a viral vector such as the adeno-associated virus) to shuttle genetic material into a part of the brain. The gene used leads to the production of an enzyme that helps to manage PD symptoms or protects the brain from further damage.[3, 11]

• Neuroprotective agents:

Agents currently under investigation include anti-apoptotics(omigapil, CEP-1347), ant glutamatergics, monoamine oxidase inhibitors (selegiline, rasagiline), promitochondrials (coenzyme Q10, creatine), calcium channel blockers (isradipine) and growth factors (GDNF). Preclinical research also targets alpha-synuclein.A vaccine that primes

the human immune system to destroy alpha-synuclein, PD01A (developed by Austrian company, Affiris), has entered clinical trials in humans.[3, 11]

• Neural Transplantations:

Since early in the 1980s, fetal, porcine, carotid or retinal tissues have been used in cell transplants, in which dissociated cells are injected into the substantia nigra in the hope that they will incorporate themselves into the brain in a way that replaces the dopamine-producing cells that have been lost.[3, 11] Although due to over Dopamine secretion, it can leads to Dystonia like ADR.

To summarize, "Parkinson's disease (PD) is the second most frequent common neurodegenerative disease affecting more than a million people in the USA", says Dr. Ankit Shah, Post-Doctoral Associate, Division of Pharmacology & Toxicology, University of Missouri, Kansas City, USA. Dr. Ankit Shah is a neuroscientist and neuroimmunologist having high impact publications and more than 300 citations early in his career. He adds, "There are 2 major theories behind the onset of PD; (i) (epi)genetic and (ii) environmental factors. Etiologically, how exactly neuronal damaged leads to PD is still controversial; but the mechanisms could be loosely categorized into (i) external toxin-mediated damage to dopaminergic neurons, (ii) increased oxidative stress in the brain and (iii) neuroinflammation. Till date, the disease is incurable and disease-modifying drugs are beneficial but not promising. The biggest challenge in the therapeutic approaches is to identify a definitive biomarker, which limits the current clinical practices to physical examinations and family history. Clearly, dietary changes and environmental factors provide negligible assistance if any. New pre-clinical studies are published on a regular basis with some advances in this area. Some immunomodulatory drugs and alpha-Syn targeting gene therapy have been suggested as promising options in the last decade. However, rigorous efforts are required to overcome clinical challenges."

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