Sreevarshan S (TL)
Vishwa S (M1 Lead)
Sreehari Pranesh K(M2 Lead)
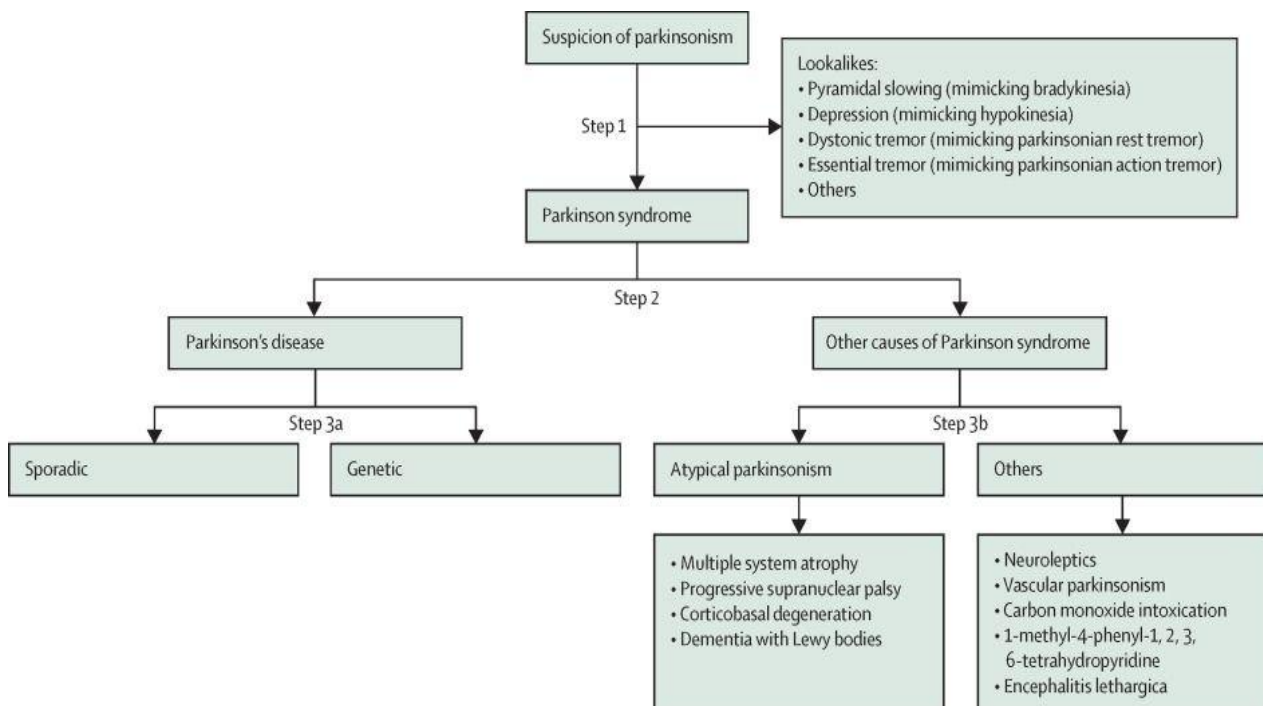Vinith Kumar S(M3 Lead)

Ideation Phase
Empathy Map
Parkinson's Disease Detection using ML

Abstract:

Generally,As lifestyle changes new diseases will be discovered starting from plague to Covid. But some diseases cannot be cured but can prevent it through early detection like Parkinson's disease in which slowly degrades the life out of the human.The recent report of the World Health Organization shows a visible increase in the number and health burden of Parkinson's disease patients increases rapidly. In China, this disease is spreading so fast and estimated that it reaches half of the population in the next 10 years.

Parkinson's disease is the second most dangerous neurological disorder that can lead to shaking, shivering, stiffness, and difficulty walking and balance. It caused mainly due by the breaking down of cells in the nervous system. Parkinson's can have both motor and non-motor symptoms. The motor symptoms include slowness of movement, rigidity, balance problems, and tremors. If this disease continues, the patients may have difficulty walking and talking. The non-motor symptoms include anxiety, breathing problems, depression, loss of smell, and change in speech. Neuro-degenerative disorders are the results of progressive tearing and neuron loss in different areas of the nervous system.

General Detection of PD through medical process:

Environmental factors: Environment is defined as the surroundings or the place in which an individual lives. So the environment is the major factor that will not only affects the human's brain but also affects all the living organism who lives in the vicinity of it. Many types of research and evidence have proved that the environment has a big hand in the development of neurodegenerative disorders mainly Alzheimer's and Parkinson's. There are certain environmental factors that are influencing neurodegenerative disorder with high pace are:-

➢ Exposure to heavy metals (like lead and aluminum) and pesticides.
➢ Air Quality: Pollution results in respiratory diseases.
➢ Water quality: Biotic and Abiotic contaminants present in water lead to water pollution.
➢ Unhealthy lifestyle: It leads to obesity and a sedentary lifestyle.
➢ Psychological stress: It increases the level of stress hormone that depletes the functions of neurons.

• **Brain injuries or Biochemical Factors:** The brain is the control center of our complete body. Due to certain trauma, people have brain injuries which leads some biochemical enzymes to come into the picture which provides neurons stability and provides support to some chromosomes and genes in maintenance.

• **Aging Factor:** Aging is one of the reasons for the development of Parkinson's disease. According to the author in India, 11,747,102 people out of 1, 065, 070, 6072 are affected by Parkinson's disease.

• **Genetic factors:** Genetic factor is considered as the main molecular physiological cause which leads to neurodegenerative disorders. The size, depth, and effect of actions of different genes define the status or level of neurodegenerative disease which increases itself gradually over time. Mainly the genetic factors which lead to Neurodegenerative disorders are categorized into pharmacodynamics and pharmacokinetics.

• **Speech Articulation factors:** Due to the condition associated with Parkinson's disease (rigidity and bradykinesia), some speech-language pathology such as voice, articulation and swallowing alterations are found. There are various ways in which Parkinson's disease (PD) might affect the individual.

1. The voice get breathy and softer.
2. Speech may be smeared.
3. The person finds difficulty in finding the right words due to which speech becomes slower.

Parkinson's disease symptoms :
The symptoms of Parkinson's disease broadly divided into two categories.

• **Motor symptoms:** This is a symptom where any voluntary action involved. It indicates the movement-related disorders like tremors, rigidity, freezing, Bradykinesia or any voluntary muscle movement.

• **Non-Motor symptoms:** Non motor symptoms include disorders of mood and affect with apathy, cognitive dysfunction as well as complex behavioral disorders. There are two other categories of PD which are divided by doctors:
        Primary symptom and Secondary symptom.

• **Primary symptoms:** It is the most important symptom. Primary symptoms are rigidity, tremor and slowness of movement.

• **Secondary symptoms:** It is a symptom that directly impacts the life of an individual. These can be either motor or non-motor. Its effect depends on person to person. A very wide range of symptoms is associated with Parkinson's,. Besides these symptoms, there are some other symptoms found that lead to Parkinson's disease. These symptoms are micrographic, decreased olfaction & postural instability, slowing of the digestive system, constipation, fatigue, weakness, and Hypotension. Speech difficulties i.e. dysphonia (impaired speech production) and dysarthria (speech articulation difficulties) are found in patients with Parkinson's

Sreevarshan S (TL)
Vishwa S (M1 Lead)
Sreehari Pranesh K(M2 Lead)
Vinith Kumar S(M3 Lead)

Parkinson's disease symptoms:

The symptoms of Parkinson's disease broadly divided into two categories.

Motor symptoms: This is a symptom where any voluntary action involved. It indicates the movement-related disorders like tremors, rigidity, freezing, Bradykinesia or any voluntary muscle movement.

Non-Motor symptoms: Non motor symptoms include disorders of mood and affect with apathy, cognitive dysfunction as well as complex behavioral disorders. There are two other categories of PD which are divided by doctors:
        Primary symptom and Secondary symptom.

Primary symptoms: It is the most important symptom. Primary symptoms are rigidity, tremor and slowness of movement.

Secondary symptoms: It is a symptom that directly impacts the life of an individual. These can be either motor or non-motor. Its effect depends on person to person.

A very wide range of symptoms is associated with Parkinson's. Besides these symptoms, there are some other symptoms found that lead to Parkinson's disease. These symptoms are micrographic, decreased olfaction & postural instability, slowing of the digestive system, constipation, fatigue, weakness, and Hypotension. Speech difficulties i.e. dysphonia (impaired speech production) and dysarthria (speech articulation difficulties) are found in patients with Parkinson's

Why this is Important and should we consider it.?

        Yes,We are living in the world where anything can happen at anytime. Many of us doesn't know and understand what can a simple disorder or defect in our body can lead to. This will not imply to this, it will imply to everything.One should be serious about it and try to prevent it through early detection using Automation and proceed with the treatment before getting serious. Not only people suffer, families will suffer too.

We are lucky enough because this lifestyle also brought us the technology to change the scope and view of our lives. This is true development because automation is available to everyone.

What are fears in it.?

        Many people wont look up to it because of fears like what if it is positive and there begins mental break down. The main point is that it will be scary what is the point if we wasn't able to detect the disease earlier and find the remedy immediately. This detection process isn't the scarier part it was the disease. Having a positive attitude and going through the treatment process in earlier manner through early detection can change the phase of your life.