

Considering Age And Cognitive Functions In The Analysis Of Parkinson's Disease Effects

Posted on September 11, 2019

What Is Parkinson's Disease?

It is one of the most common movements and a neurodegenerative disorder named after James Parkinson, a British doctor who first described the disease as shaking palsy in the year 1817. Its characteristics include trembling of the limbs, loss of control over the muscles, slowness, stiffness, and imbalance. It also becomes difficult to do normal tasks, such as walking, talking, etc., when the symptoms get worse. The degree or extent of impairment and imbalance changes from person to person. Some become disabled sooner, while others manage to lead their lives productively. The complications of the disease, such as pneumonia or injuries, can become a cause of premature death. Most people found with the disease are reported to be sixty years of age or older. Parkinson's disease is most common in adults, but it can also occur between 21-40 years of age or even before 21. The history of the disease is as old as 5000 BC. There had been an old Indian civilization that named the disease Kampavata. They had been treating it using plant seeds, which consisted of therapeutic levels, which are now called levodopa.

Signs And Symptoms

The indications of the disorder are connected with voluntary and involuntary motor function and often initiate on one side of the body. Usually, the signs are mild at the early stage and start advancing with the passage of time (medicinenet.com). Some get more affected by it than others. Studies suggest that when the primary signs and symptoms start appearing, persons with the disease will become deficient in 60-80 per cent or maybe more of the cells in the brain which are responsible for the production of dopamine. Following are some of the key signs and indications of Parkinson's disease.

- One of the major indications of the disease is the initiation of trembling of limbs, head, and jaw, which usually occurs while the person is at rest and not moving or doing any work. Tremors get worse when the person is stressed, tired or excited.
- The trunk and the limbs get rigid and stiff, which is enhanced when the person moves. Rigidity and stiffness cause pain in the muscles. Hand movements are no smoother, which results in cramped handwriting and other usual activities being difficult.
- Voluntary actions or movements get slower. This condition is known as bradykinesia, which, when combined with rigidity and stiffness, impacts the muscles of the face, leaving an expressionless or mask-like look.

- A person with the disorder is not able to maintain his balance and posture, which usually causes him to fall.

Other signs and symptoms include low self-esteem, depression, insecurity, and anxiety. It also causes constipation. Excessive salivation occurs, and the person faces difficulty while swallowing. Sweating increases and the sense of smell diminishes. Skin problems start occurring. The urgency of urination takes place, the problem of erection occurs in the males, and the inability to achieve orgasms in the females. Sleep disturbances also occur due to sudden movements. Just like the person starts losing the sense of smell, the frequency of his or her voice also starts decreasing. Dizziness or fainting may also occur in this disorder. The patients may also suffer from unpleasant feelings or sensations such as coldness, burning, and numbness (mayoclinic.org). Some psychological factors also include changes in personality, memory loss, and having hallucinations (seeing things that aren't present), and delusions (believing things that aren't true).

Causes Of Parkinson's Disease And Who Are The Affected People

In Parkinson's disease, the neurons in the brain go through a breakdown or completely die. The majority of the indications of the disease are because of the deficiency or loss of neurons that are responsible for producing dopamine. Dopamine is a chemical messenger in the brain that, if it decreases, the brain starts working in an abnormal way, making way for the indications and symptoms of Parkinson's disease. The following factors contribute to the initiation and development of Parkinson's disease (mayoclinic.org).

- Genetic influence: Certain changes in the genes have been observed to cause Parkinson's disease. This isn't very common since it's rare that the family has a lot of members with the disease. However, certain alterations and variations in the genes exist that enhance the risk of the disorder.
- Environmental factors: Exposure to some ecological factors or toxins may enhance the threat of bringing about the disease.
- The existence of Lewy bodies: There are clumps of particular substances within the brain cells that are considered tiny markers of Parkinson's disease. These substances are known as the Lewy bodies and are reported to hold a significant clue to the development of the disease. A substance called alpha-synuclein exists inside the Lewy bodies. A-synuclein is a widespread and natural protein found in a clumped form.

It is believed that 1 in every 500 people is affected by Parkinson's disease. The majority of people get the disease when they're over 50 or 60 years of age. Every 1 in 20 people starts experiencing the signs of the disease when they're under the age of 40. Considering the gender differences, women are a little less likely to become the victim of the disease as compared to males.

Statistics On The Prevalence Of Parkinson's Disease

According to an estimation, 7-10 million have Parkinson's disease worldwide. The disease ranges from 41 individuals per 100,000 to more than 1900 individuals in every 100,000 among those who are 80 or older. Before 50 years of age, 4% of people have been diagnosed with the disease. Based on the gender difference, men are one and a half times more likely to get affected by the disease than females. In the USA, 60,000 people are diagnosed with the disorder annually. Approximately 6600 people are reported to have the disease yearly. In the UK, Parkinson's disease affects one in every 500 people (parkinsonsnewstoday.com).

Parkinson's Disease And How It Affects The Cognition And Ageing Process

One of the major risk factors for the progression and development of Parkinson's disease is age. The process of ageing impacts several cellular mechanisms that influence the neurodegeneration and the pathogenesis of Parkinson's disease. With increasing age, many compensatory procedures or mechanisms fail, and damage to the somatic cells accelerates the development of the disease. This is why older people are mostly targeted by the disease. Increasing age leads to decreased activity of the dopamine chemical, which leads to the generation of the disorder. When the normal cells and the functions related to them start failing with age, certain regions of the brain are affected and the risk increases. Thus, Parkinson's disease is also known as an age-related disease (Hindle, 2010).

Diagnosis And Treatment Of The Disease, And How Is Technology Playing A Role?

There's no specific way to diagnose the presence of the disease. However, some main symptoms must be present in the person which indicates the disease, such as tremors or shaking, bradykinesia or the slowness of movements, rigidity or stiffness of the limbs and muscles, difficulty in maintaining balance, and thus falls (parkinson.org). There is no cure for Parkinson's disease at present. Many therapies and treatments have been made ready to delay the commencement of the motor signs and symptoms and ameliorate them. These treatments and therapies are designed using technology to enhance the level of dopamine in the brain. This is done either by the replacement of dopamine, simulation, or extension of the impacts of dopamine by hindering its breakdown. It has been observed through studies that early treatment in the non-motor phase can help delay the commencement of the symptoms, hence improving the quality of life.

The therapy considered most effective for the disease is levodopa, which is transformed into

dopamine inside the brain. Since a long-term cure using levodopa leads to some side effects which are not pleasant at all, such as painful cramps, involuntary actions, etc., its usage is delayed unless the impairment is more serious and severe. Carbidopa is often prescribed levodopa as it stops the breakdown of levodopa before it approaches the brain. This minimizes the side effects of levodopa. There are substances that imitate the action or function of dopamine. These can be utilized in the earlier phases of the disease. They minimize the breakdown of dopamine and relieve the symptoms. However, it also has side effects, such as swelling, hallucinations, nausea, constipation, and dizziness.

When the symptoms get severe and are uncontrollable, surgery is needed. Implanting electrodes for the stimulation of the brain regions involved in the movement is a common practice in deep brain stimulation (DBS). There is another kind of surgical treatment that destroys the parts of the brain, causing the disease. A therapy known as stem cell therapy is also applied for the cure. Cells responsible for producing dopamine are derived from stem cells. This therapy is quite useful, but in-depth research is needed to investigate the therapeutic importance and value in the cure of Parkinson's disease (medicinenet.com).

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