Parkinson’s Disease

Parkinson’s disease is a progressive degenerative neurological condition affecting the central nervous system. It has an incidence of about 0.2% and affects around 130,000 people in the United Kingdom. It generally affects adults in the sixth decade and beyond but younger people may acquire it and one in twenty is under the age of forty.

It is characterised by deterioration in motor (movement) skills, speech and also other functions. The key features of the condition are muscular rigidity, tremor and bradykinesia (a general slowing of movement). Affected people may also develop disorders of posture, walking and, in extreme cases, loss of the ability to move.

The transmission of nerve impulses in the nervous system is extraordinarily complex and requires a combination of electrical transmission along nerves and chemical transmission between nerves.

In Parkinson’s disease there is a disturbance in the production of the chemical dopamine in particular nerves in a part of the brain called the substantia nigra (black substance) which is located in the mid-brain. The result is that there is a reduction of the nerve impulses to the part of the brain (motor cortex) which controls movement.

This leads to a generalised reduction in muscle performance which produces the principal symptoms. Initially patients may feel tired and weak and things take longer to do.

Sufferers notice poor co-ordination and problems such as deterioration in handwriting may become apparent.

About 80% may also notice a tremor in the arms which is usually apparent and is present at rest.

Rigidity may also develop and occurs because of increased muscle tone (the state where muscles are held partially contracted to maintain posture) combined with increased joint stiffness and with a
tremor. The consequence is that patients may display a characteristic called **cogwheel rigidity**, where passive movements of the limbs, as during a physical examination, elicits ratchet-like, jerky start-and-stop movements through a range of movements of the joint.

The **bradykinesia** (difficulty, literally slowness, in movement) is the most disabling feature of the disease, particularly in its early stages and causes difficulty both when movements are initiated and during their commission. Patients may develop a shuffling gait and almost appear to fall forwards as they walk.

In the later stages of the disease patient may lose balance and fall. Other features include speech and swallowing disturbances and the development of a mask-like facial expression, cognitive impairment (trouble remembering, learning new things, concentrating, or making decisions that affect their everyday life), difficulty problem solving and retaining attention on activities.

The cause of Parkinson’s disease is not known in the majority of cases but, for some, it may have a genetic basis. 15% of sufferers have a first-degree relative with the disease.

The diagnosis of the disorder is based on medical history and examination of the nervous system. There is no specific test but normally blood tests and brain imaging will be undertaken, although both CT and MRI scans usually appear normal. They do, however, rule out other causes of similar symptoms such as brain tumours, stroke and other brain disorders.

When a diagnosis of Parkinson’s disease is suspected after initial evaluation, a drug called carbidopa-levodopa may be prescribed, which replaces dopamine in the brain and demonstrates improvement of symptoms over time.

The identification of **Lewy bodies** (abnormal collections of protein) in post-mortem brain specimens is the definite way of confirming that a patient had the disease.

Most doctors agree that patients do not die of Parkinson’s disease itself but of intercurrent medical diseases.

Mental deterioration usually provides the final cause of death. Overall, life expectancy is reduced, but with modern treatments, it is on average less than five years.

There is no cure for Parkinson’s disease but treatment is available to help to control the principal symptoms and to maintain the quality of life for as long as possible. Treatments include:

- Supportive therapies (e.g. physiotherapy)
- Medication
- Surgery (for a few people)

In the early stages of the disease, disability may be minimal or mild and no treatment may be required.

**NICE** (The National Institute for Health and Care Excellence) provides detailed guidelines for treatment.
Physiotherapy may relieve muscle stiffness and joint pain, thereby increasing flexibility and improving walking. This improves fitness levels and maintains independence.

Diet advice is important because general slowing often results in lack of a proper eating regime and unintentional weight loss, together with constipation.

Medication may relieve the main symptoms of the disease such as the tremor and difficulty in movement.

Levodopa is absorbed by brain nerve cells to produce dopamine, which is a chemical transmitter in the brain, enhancing the nerves that control movement. It often causes a dramatic improvement in symptoms but its effect gradually declines necessitating increasing dosage. Sinemet and Madopar are drugs used.

Dopamine agonists act as a substitute for dopamine in the brain. They may be taken by tablet or used as a patch (rotigotine). They may have significant side effects.

Monoamine oxidase-B inhibitors. These drugs block the effects of the chemical which breaks down dopamine, thereby increasing brain levels of the chemical. Selegiline and rasagiline improve symptoms to some degree.

Surgery may be used in a small proportion of patients and may involve placing a pulse generator in the chest with wires to the brain which stimulate the affected brain area.

Parkinsons’s disease bears the name of James Parkinson (1755-1824) who was a surgeon, apothecary and palaeontologist.

He trained at the London Hospital and at the Royal College of Surgeons. He was a committed social reformer and outspoken critic of Prime Minister, William Pitt.

The pinnacle of his medical career was his publication, in 1817, of an “Essay on the Shaking Palsy” in which he first described paralysis agitans which was later renamed Parkinson’s disease.

The condition is no respecter of celebrity or notoriety.

Famous suffers include actors Michael J Fox, Anna Neagle, Deborah Kerr, Vincent Price, Kenneth more, Terry Thomas and James Doohan (Scottie in Star Trek).

Also sportsmen include the late, great Muhammad Ali and dictators such as Adolf Hitler and Francisco Franco.

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