Parkinson's Disease And Its Implications

Syed Riaz Baqar

Introduction

Parkinson's disease is not yet fully understood. The level of public awareness is still remarkably low with a lot of misconception. It is also sometimes called as movement disorder disease. Though, the true cause of the disease is not yet known but the prospect, for major steps forward in the treatment or even prevention of Parkinson's disease look better now than ever before. Some people regard one brain disease as much like any other, a cause of unremitting loss of all physical and intellectual faculties over short period of time. But for Parkinson's disease this is not the general truth. Though some generalization may be made but one must realize that each patient is an individual and not everyone has the same symptoms. Many patients with Parkinson's disease are managing perfectly well but others do have persistent problems, despite treatment and careful management.

Definition and symptoms

The disease is named after an English physician James Parkinson's (1755 - 1824) who published a book entitled "Essay on the Shaking Palsy". In the book he described his own observation on his six patients who were suffering from involuntary shaking of the arms, legs and body. He called this disease as "Paralysis agitans" or Shaking Palsy. This disease was later renamed as Parkinson's disease by a French neurologist, Charcot, in the honour of this man who first discovered it. Although James Parkinson is best known for his description of Parkinson's disease, he later developed other interests. His interests were not only confined to medicines, he also wrote books on animals and vegetable fossils. Though Parkinson's disease is characterized by a kind of tremor but he realized that Tremors may be caused by several other factors. It is now well known that there are many conditions; some common and some rare, that look at first sight very much like Parkinson's disease, but which can usually be distinguished by careful examination. Patients who have had a number of small strokes may walk in similar manner as patients of Parkinson's disease. Some form of tremor run in families.

Some diseases, however resemble more with Parkinson's disease and may be difficult to distinguish. These diseases may be related to nervous system besides being infections, side effect of drugs, poisonous substance, inherited diseases, head trauma, normal pressure hydrocephalus, thyroid disease and other metabolic disorder. Not all patients with Parkinson's disease have tremor, especially in early stages, so the diagnosis may be delayed until tremor develops. According to one estimate Parkinson's disease effects approximately one in every 500 people and there is no suggestion that it is more common in black than white or vice versa.

Most people develop this disease between the ages of 50 and 80 years, however people between 30 and 40's may also get it. It is rare under the age of about 30 years. Taken through a whole life time, every body has a one in 40 chance of developing Parkinson's disease at some time. It is not a fatal disease like various forms of cancer.

Patients of Parkinson's disease have been described as more introvert, rather mentally inflexible and prone to depression. These personality feature seem to be present prior to the onset of the disease so they are not caused by it, rather they seems to indicate that particular personality type are prone to Parkinson's disease. Some people suggest that the personality type exists in Parkinson's disease because the brain changes began vary many years earlier, but others think that it simply shows the susceptibility of certain sort of people.

Parkinson's disease is mainly a disorder of movement but it is not a disease of the muscles. A simple movement as lifting of one arm requires the contraction of several muscles, including those of shoulders, the elbow and the forearm. The coordination of the nerve messages to muscles in different parts of the body occurs with the brain. The brain uses a variety of different chemicals to transmit messages across nerves-dopamine is one such chemicals, acetylcholine and noradrenaline are others.

The brain and nervous system consists of a series of cells, like wires; messages are sent from one cell to another, in a similar way to the transfer of messages to a computer across wire. One particular part of the brain that is important for coordination is called the basal ganglia and is located in the centre of the brain. When an individual decides to make a movement the thinking part of the brain sends its instructions...
to the *basal ganglia* and the *basal ganglia* then coordinates a series of messages that pass out, at the right time to each part of the nervous system. Within the *basal ganglia*, the cells that produce *dopamine* die off and the remaining cell then cannot generate a strong enough message for it to pass from one cell to the next, the result being that the basal ganglia cannot work effectively. The system that coordinates movement thus fails which leads directly to the symptoms of Parkinson's disease. The main area affected is called as *substantia nigra* because, when stained in a particular way and examined under microscope, shows blackened area as compared to the rest light grey area.

Lack of *dopamine* from the *basal ganglia* means that the messages transmitted from the thinking part of the brain cannot be translated and passed on to the individual muscles. This means that one knows what to do, but the muscles fail to respond. This means that sometimes one may be able to move his arms or legs, but on the other occasions the message simply does not get through. The other side effects such as rigidity and tremor are complicated, but can be thought of as a problem in blocking false message. Just as the *basal ganglia* cannot let the right messages through in Parkinson's disease, they also fail to block the wrong messages.

**Diagnosis**

Determination of the loss of dopamine, in other words the diagnosis of Parkinson's disease, is now possible, using a technique known as *positron emission tomography (PET)*. This works like an elaborate brain scanner. However the equipment for PET is available in only few countries/cities through out the world and is used only for research purposes. It is hoped that in future such facilities will become more common so that more and more people will be benefitted by it. At present the diagnosis of Parkinson's disease can be made clinically by taking a detailed history of symptoms and by performing an examination which may detect no signs that indicate an alternative diagnosis. All other diseases should be ruled out by various tests, especially diseases such as thyroid disease, Wilson's disease and other problems with blood chemistry. This should be followed by CT (Computerized Tomography) or MRI (Magnetic Resonance Imaging) scan and an EEG (Electroencephalograph). These two tests can provide positive evidence of previous stroke, Alzheimer disease or normal pressure hydrocephalus. Often the diagnosis of Parkinson's disease is too obvious to the doctor and there can be no confusion with any other diagnosis. The tests are usually done to rule out other conditions. Parkinson's disease is common in older people and that does not prove that it is caused just by aging. Indeed it seems to become rather less common after the age of 80. This suggests that one should not expect this if the disease were simply due to getting old. To some degree, however, aging probably does increase the risk of getting Parkinson's disease, though some other factor has to occur to get the disease. As one gets older, the brain tends to show changes similar to those of Parkinson's disease, but in a much milder form.

The tremor of Parkinson's disease typically occurs at rest and improves when the limb is in use, such as when holding an object. The rest tremor usually affects the fingers, hands and head but in more advance cases the legs may be effected also. The main movement involved in this sort of tremor is synchronous opening and closing of the four fingers combined with movements of the thumb and sometimes twisting of the wrist. The tremor of Parkinson's disease may also effect the head, when it produces a nodding movement or a side-to-side shaking. Involuntary head movement of this kind are called *rituation*. The Parkinsonian tremor usually occurs at a frequency of four to eight times per second. This tremor may increase by fear, anxiety or anger and sometimes by extreme joy. As with most involuntary movements the tremor disappears in sleep.

Another type of abnormality of movement called *dyskinesia* is not directly due to Parkinson's disease but which can occur as a complication of treatment, usually treatment with the drug levodopa. The most common form of dyskinesia is called chorea. This is quite unlike the rest tremor of Parkinson's disease.

It has been universally recognized that difficulties with memory do occur in Parkinson's disease and a proportion of people become depressed. Some of the drugs that are used as treatment can effect memory and mood; sometimes for better, sometimes for worse. However there are different causes of memory loss in Parkinson's disease. Anti-Parkinson's drug may provoke hallucinations when there is no dementia (serious loss of intellect), but the risk is much greater in those people whose memory and intellect are normal. The anticholinergic drugs are more troublesome and should be taken with great care, after discussion with doctor, especially when one feels that his memory is failing. Sometimes poor memory can be caused directly by depression and will improve on antidepressant drugs. Depression is common in Parkinson's disease, if occurs in the early as well as in the later steps, although the causes may be different.

One particular mental disorder that has been specially associated with Parkinson's disease is called *bradyphrenia*, slowness of thinking. This term has been used to describe a
certain slowness of response, for example in reply to a question one may have to wait for a second or two but the answer will be sensible. Bradyphrenia may be linked to depression because depression can produce slowness.

Constipation and passing of water is a common difficulty among elder but it is more common if one has Parkinson's disease. Some people with Parkinson's disease have active sexual desire, but are put off because of the physical difficulties of their condition. Often sexual problem arise more from a fear of failure than from real physical handicap. Some of the drugs used in Parkinson's disease, especially anticholinergic drugs, can interfere with man's ability to achieve erections. There are however other causes of erectile failure, such as diabetes among others.

Changes in sweating occur in Parkinson's disorder which may be either reduction of sweating or excessive sweating. Similarly saliva tends to collect in the mouth and drool from the corners. This may be due to normal swallowing of salvia. Some patients of Parkinson's disease produce excessive salvia and may suffer from dizziness which may be caused due to fall in blood pressure. Some typical symptoms in the patient of Parkinson's disease are swelling of ankles due to collection of fluid, trouble in eye, greasy skin and breathing difficulty.

Some important line of treatment

In a small editorial like this, because of the scarcity of space, it is not possible to discuss all measures that may be adopted to handle patients of Parkinson's disease, however a few selected methods of treatment have been mentioned. Since 1960 a lot of advancement has been made in the treatment of Parkinson's disease. Several medicines are now available which can alleviate the suffering among the patients. However, one drug that is suitable for one person may be quite unsuitable for another. All drugs differ according to the number of times per day that they need to be taken. Some can be given only twice a day, while other may be prescribed to be given more frequently. In fact different drugs have slightly different effect on the human chemistry and can be of varying benefit for the different problems of Parkinson's disease. Some drugs may be more helpful for the akinesia (slow movement of body parts). Whereas other drugs appear better for dealing with tremor. In addition some drugs, such as selegiline, are used not as a main treatment but to support the action of other drugs, such as levodopa. People who have a variety of problem may use a mixture of drugs.

Anticholinergic drugs have only a mild to moderate effect on the symptoms of Parkinson's disease producing approximately 25 percent improvement on average. The main sign of Parkinson's disease such as tremor, rigidity and akinesia are helped more or less equally. Anticholinergic treatment is not as effective as levodopa treatment and tends to be used as a first line therapy only for mild early cases. The main anticholinergic drugs are benzhexol (Artane), orphenadrine (Dispal) benzotropine (Cogentia), procyclidine (Kemadrin) and methixene (Tremonil). This drug, however, may cause side effects such as dry mouth, blurring of vision, difficulty in passing urine, dizziness, confusion, insomnia sedation, impotence, poor memory and agitation among others.

The other drug used is Amantadine. This may be used as an addition to levodopa treatment. Side effects are relatively few as sleeplessness, swelling of ankles, skin rashes and agitation. Sometimes, confusion and hallucination may develop when drug is used in combination with levodopa. The use of levodopa treatment, in one form or another, has been in the forefront of treatment of Parkinson's disease. Its side effect of vomiting and nausea has been much improved in the new drugs, Madopar and Sinet. Pergolide and bromocriptine are not commonly used alone although sometimes they can be as effective as levodopa in relieving Parkinson's disease disorder.

Need For Further Research

Parkinson's disease forms an area of active research and prospects of developing more effective drugs are good. Firstly all our bodily activities are controlled by our genetic makeup. The gene causing Parkinson's disease has been identified recently. It may be possible one day to modify the gene that controls the production of dopamine. Research is being carried out in that direction and some day it may be possible to manipulate this gene. Secondly it is the general belief that brain once damaged, was incapable of repairing itself, in contrast to other body organ, which may be able to heal. However it has now been reported that it may be possible to persuade the brain to repair itself under some special conditions. Though this research is still in its infancy it provide hope that treatment in the future may be geared towards an actual repair of the cells that are damaged in Parkinson's disease.