



Modern Solutions for the Prevention and Diagnosis of Parkinson's Disease

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Abstract: Parkinson's disease is a serious and persistent progressive pathology. Treatment depends on the stage at which the patient consults with a doctor. Parkinson's disease is a degenerative pathology of the central nervous system, the main symptoms of which are: motor disorders, postural disorders.

There is a syndrome of parkinsonism, which is called "Parkinson's disease", and true parkinsonism, which occurs in certain pathologies of the central nervous system, for example, with head injury, encephalitis. Parkinsonism syndrome (parkinsonism) - a pathological condition manifested by stiffness in movements, involuntary tremors of the head and limbs, and constant muscle hypertonicity. Parkinson's disease is considered an independent disease, but its symptoms are similar to Parkinson's syndrome.

Key words: What is Parkinson's disease, Causes of Parkinson's disease, Symptoms of Parkinson's disease, Parkinson's disease in women, Parkinson's disease in men, Stages of Parkinson's disease, Diagnosis of Parkinson's disease.

Causes of Parkinson's disease

It is believed that the disease is caused by hereditary factors, exposure to toxic substances in the external environment, and aging. Genetic mutations in young people are the main cause of the development of the pathology.

Factors that increase the likelihood of developing true parkinsonism:

- a. old age ;
- b. genetic predisposition;
- c. long-term use of certain medications;
- d. diseases of the central nervous system and brain;
- e. poisoning with chemical compounds;
- f. malignant tumors;
- g. poor environmental situation.



Heredity plays a significant role in the development of Parkinson's disease. If a family member has been diagnosed with the condition, the risk of developing it in subsequent generations is almost doubled.

Symptoms of Parkinson's disease

The disease is characterized by: tremor, hypokinesia, rigidity, and impaired postural regulation.

The most common tremor is the resting tremor, which is the easiest to identify. Sometimes other types of tremor occur, such as postural or intention tremor.

Muscle rigidity can appear almost at the very beginning of the pathology, usually with the tremor form of Parkinson's disease. Even a slight asymmetry of tone in the limbs is a characteristic feature of true parkinsonism.

Hypokinesia in pathology includes:

- a. slowness of movements;
- b. reduction in the number of movements;
- c. decrease in amplitude and speed of movements.

Hypokinesia is a mandatory sign of parkinsonism of any origin. In the early stages of the pathology, it is often difficult to detect it, so the doctor may ask the patient to quickly clench and then unclench his fist. The first signs of hypokinesia appear when performing simple everyday actions, such as combing your hair or fastening small buttons.

Postural abnormalities, such as asymmetrical forward-slung arm posture, appear early. However, doctors usually pay attention to them in the third stage of the pathology, since postural abnormalities are less characteristic of true parkinsonism than its other symptoms.

Non-motor ("invisible") manifestations of the pathology are very common and can complicate life no less than significant problems with movement. These symptoms include:

- a. impaired olfactory function;
- b. sleep problems;
- c. dementia;
- d. cognitive symptoms, such as memory loss;
- e. constipation;
- f. disorders in bladder emptying;
- g. excessive sweating;
- h. fatigue;
- i. sexual dysfunction;
- j. pain syndrome, especially in the arms and legs;
- k. anxiety and depressive disorders;
- l. salivation;
- m. dysarthria and (or) dysphagia;
- n. restless legs syndrome.

Parkinson's disease in women

The production of estrogen in the female body helps maintain normal dopamine levels, so the pathology in women is less common than in men and develops more slowly (usually after



menopause). The causes of the development of true parkinsonism do not differ in both sexes, but there are additional factors that provoke it in women:

- a. early menopause;
- b. at least three pregnancies;
- c. ovarian dysfunction;
- d. oophorectomy.

The first symptoms of Parkinson's disease are similar to those of other pathologies. A woman may be concerned about:

- a. persistent constipation;
- b. voice change;
- c. loss or sharp decrease in smell;
- d. bending;
- e. depressive disorder.

At the onset of the disease, you may experience the following: restless legs syndrome, pain in the shoulders and upper spine, increased sweating, and increased salivation.

Pathology in women occurs with the general symptoms described above, but during menstruation (usually in patients aged 35-45 years), there may be changes in well-being and disturbances in the regularity of the cycle.

Parkinson's disease in men

As mentioned above, true parkinsonism develops not only in old age, but also more often in men than in women. The disease is also diagnosed in the middle age group.

The initial symptoms of the pathology are similar to those of other diseases. These include:

- a. impaired sense of smell;
- b. problems with the gastrointestinal tract and urination;
- c. memory impairment;
- d. appearance of stiffness of movements;
- e. slow walking;
- f. change handwriting in a short time;
- g. slight tremor of one hand, which increases during emotional turmoil and with severe physical fatigue;
- h. restless sleep, etc.

In the future, other symptoms of the disease appear:

- a. increase in the amplitude of tremor, its spread to the other hand, head;
- b. decreased mobility of facial muscles;
- c. increased sweating;
- d. development of dementia.
- e. Stages of Parkinson's disease



Depending on the severity of the disease, there are 5 stages according to the Hoehn-Yahr classification:

- a. zero - no engine failure;
- b. the first is a unilateral manifestation of the disease;
- c. the second is bilateral manifestation without postural disorders;
- d. third - moderate postural instability, requiring the patient to be assisted by 3 people;
- e. fourth - severe loss of motor function, the patient cannot stand or move without the help of someone else;
- f. fifth - in bed (or chair), unless the patient uses the help of 3 people.

Parkinson's disease diagnosis

As a rule, diagnosis is carried out in 3 stages:

- a. Definition of Parkinsonism syndrome, as well as its distinction from other pathologies. True parkinsonism is characterized by hypokinesia, which is combined with one of the following symptoms:
 - b. tremor at rest;
 - c. muscle stiffness;
 - d. postural instability not caused by other primary disorders.
- e. Exclusion of other pathologies characteristic of Parkinsonism syndrome. Parkinson's disease is excluded in the following cases in a patient:
 - f. oculological crises;
 - g. therapy with antipsychotic drugs before the onset of pathology;
 - h. A history of recurrent stroke, diagnosed encephalitis, or recurrent TBI with gradual development of parkinsonism symptoms;
 - i. only unilateral symptoms of the disease for three or more years;
 - j. supranuclear palsy;
 - k. long-term remission;
 - l. early onset of dementia;
 - m. cerebellar signs;
 - n. early clear manifestation of autonomic insufficiency;
 - o. brain edema or open hydrocephalus;
 - p. unsuccessful treatment with large doses of levodopa;
 - q. Babinski syndrome;
 - r. Toxic effects of MPTP.
- s. Identifying signs that indicate true parkinsonism. This requires the presence of at least 3 of the following criteria:
 - t. unilateral symptoms at the onset of pathology;
 - u. tremors at rest;
 - v. asymmetric severity of symptoms;



- w. 70-100% response to levodopa;
- x. effective results of levodopa treatment for five years or more;
- y. the duration of the pathology is from ten years.
- z. People suspected of having true parkinsonism undergo REG, EEC, MRI, and CT scan of the brain.
- aa. Parkinson's disease treatment
- bb. Features of the treatment of the disease depend on its stage of development.

Therapy in the early stages

At the onset of the disease, drugs are prescribed that have a beneficial effect on dopamine synthesis in the brain and prevent the death of neurons: selegiline, piribedil, amantadine, etc. They are used in various combinations or separately.

Although these drugs do not have the same effects as levodopa, their use is possible in the early stages of true parkinsonism. They can help delay treatment with levodopa and reduce its dosage in advanced cases. However, such drugs have significant side effects.

Therapy in the later stages

As the pathology progresses, its old symptoms intensify and new ones appear, many of which are difficult to treat. If the patient takes levodopa, its effectiveness decreases, drug-induced dyskinesias increase, which is associated with an increase in the sensitivity of dopamine receptors.

Doctors sometimes increase the dose of levodopa to improve the results of treatment. However, you can help the patient in one of the following ways:

introducing another dose of levodopa into the treatment to reduce the interval between doses of the drug;

adding a COMT inhibitor to the therapeutic regimen, as well as switching the patient to treatment with a combination drug of entacapone and levodopa.

The difficulties in treatment in the final stage of true parkinsonism are explained by cachexia, a decrease in the ability to stand, walk, and take care of oneself. During this period, the patient requires a number of restorative procedures.

Sometimes surgery is performed for true parkinsonism.

Parkinson's disease prognosis

Symptoms of the pathology gradually progress. Untreated patients lose the ability to care for themselves eight years after the onset of the disease, and after ten years they become bedridden.

Parkinson's disease shortens life expectancy. Depending on the severity of neurological symptoms, the patient is assigned a disability group.

Preventing Parkinson's disease

To reduce your risk of true parkinsonism, you should:

timely treatment of vascular diseases of the brain as a result of injuries or infections;

do not take medications that cause parkinsonism without a doctor's prescription;

minimize the effects of stress;

adherence to a healthy lifestyle;

Eat foods rich in vitamin B and fiber;



Do not come into contact with toxic substances.

Parkinson's disease is poorly understood, but the use of levodopa has helped to significantly reduce the mortality of patients. However, the pathology remains very serious and requires immediate medical attention.

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