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The Origins of Neurosyphilis Prevention and Modern Diagnostic Methods

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Abstract: Neurosyphilis is a secondary disease of infectious etiology, which is a lesion of the nervous system. Its causative agent is the bacterium Treponema pallidum, which, entering the body of an adult or a child, causes the development of an acquired or congenital form of syphilis. Today, about 20% of patients with syphilis have damage to the nervous system, the proportion of which is neurosyphilis is 8-9%.

Keywords: Description of the disease, Causes of syphilis, Causes of neurosyphilis, Late neurosyphilis, Early neurosyphilis

Description of the disease

Syphilis is one of the most common sexually transmitted diseases, the causative agent of which is the bacterium Treponema pallidum, Treponema pallidum. Its most severe and dangerous complication is neurosyphilis, in which the pathological process spreads to the central nervous system. It develops in the absence of timely and adequate treatment of the sexually transmitted disease.

Syphilis infection most often occurs through the genitals or mouth. After entering the body, Treponema pallidum spreads to almost all internal organs, affecting all systems. The development of neurosyphilis is said to occur if the infectious process has spread to the structures of the brain and spinal cord.

Infection of the brain and spinal cord has its own characteristics, according to which this complication is classified as a separate disease. Neurosyphilis is a pathology that is considered the most severe complication, difficult to diagnose and treat. In most cases, it occurs in the second or third stage of venereal disease, with the active spread of bacteria through the bloodstream to all internal organs.

Over the past 5-10 years, experts have noted the spread of neurosyphilis with various manifestations. The symptoms of the pathology in each individual case depend on its intensity and the area of damage.

With timely diagnosis and proper treatment, the prognosis is considered relatively favorable. Otherwise, there is a high risk of disability or even death of the patient due to permanent and severe neurological disorders.

Causes of neurosyphilis

Neurosyphilis is a secondary disease that develops when syphilis is diagnosed too late or is not treated. In advanced stages, the disease affects the brain structures. The risk of such damage is especially high in cases of head injury and somatic pathologies.

Causes of syphilis:

sexual intercourse - vaginal, anal or oral;

sharing the same syringe with an infected person;

syphilitic blood transfusion;

kissing an infected person;

bites of mosquitoes and other blood-sucking insects;

low-quality disinfection;

intrauterine infection;

Dental treatment.

The main risk group includes men and women who have been diagnosed with AIDS or HIV infection, who use drugs, have sex without a condom, and who work or use intimate services.

Syphilis can be congenital. A newborn baby can get the infection from the mother, as treponema pallidum enters his body through the placenta. Congenital pathology can be detected by a red rash and blisters on the baby's skin, bleeding from the nose, and cracks around the mouth.

Neurosyphilis pallidum develops due to the penetration of Treponema pallidum through the lymph and blood into the blood vessels, membranes and substances of nervous tissue. The development of the initial form of the pathology begins 4-5 years after infection.

The infectious process gradually spreads to the vessels and membranes of the brain, leading to inevitable consequences in the form of hemorrhages and degenerative changes. In addition to the membranes of the nervous tissue, the infectious pathogen damages the entire central nervous system, which leads to irreversible complications.

The main danger of a sexually transmitted disease is that it can develop almost asymptomatically in the early stages, which can last for several years. In this case, after 10-15 years, tertiary syphilis can manifest itself - an undetected or untreated infection.

The tertiary form of the disease affects almost all internal organs and systems - the heart, nerve endings, lungs, liver, kidneys, eyes. In the advanced stage of neurosyphilis, an infected person faces irreversible complications: from memory loss and disability to dementia and death.

Classification

Neurosyphilis is divided into two types - early and late. The clinical manifestations of the former usually become noticeable within the first 4-5 years after infection, and the latter - after 10-15 years.

Forms of neurosyphilis depending on the stage:

latent - occurs without obvious clinical manifestations, diagnosed by pathological abnormalities found in the cerebrospinal fluid;

early - manifests itself in secondary syphilis, usually within the first 1-5 years, accompanied by pathological changes in the meninges and blood vessels;

late - manifests itself after 6-9 years at the stage of tertiary infection and is accompanied by damage to brain structures in an inflammatory-dystrophic form.

Early forms of neurosyphilis are syphilitic meningitis and syphilitic vasculitis, late forms are tabes dorsalis, progressive paralysis, syphilitic gumma, Erb's spastic paralysis, and meningovascular neurosyphilis.

Early neurosyphilis

In the development of early neurosyphilis, the pathological process spreads to the vessels and membranes of the brain or to the structures of the spinal cord. This form of the disease has several manifestations:

Syphilitic meningitis - a pathological lesion of the meninges and the base, the first signs of which can be felt 2 years after infection. Meningitis can occur in several forms - asymptomatic, acute or chronic. The disease is accompanied by severe headache and irritability. In the asymptomatic form, objective signs of nervous system pathology may be completely absent.

Syphilitic vasculitis often manifests itself in the first years after infection. It is accompanied by thickening of medium and large arteries at the base of the brain, the detection of miliary gummas on the walls of blood vessels, and the development of Gubner's endarteritis.

Syphilitic vasculitis is characterized by regular headaches, cerebrovascular accidents, and irritability.

Late neurosyphilis

In the development of late neurosyphilis, damage to nervous tissue occurs to varying degrees. There are several forms of the disease:

Tabes dorsalis - the incubation period can last up to 5-20 years. The pathology is accompanied by inflammatory infiltration and atrophy of the dorsal roots and dorsal cords in the spine. The main symptoms are acute radicular pain, neurogenic disorders and impotence.

Progressive paralysis - the first signs usually appear late, 15-20 years after infection. This is the spread of infection to brain cells, causing cognitive impairment and personality degeneration, including complete dementia. Often accompanied by depressive and manic states, hallucinations and delusions. Progressive paralysis over several months or years leads to death.

Syphilitic gumma - most often the source of infection is located in the basal fluid cisterns, compressing the nerve endings at the base of the brain. It can also affect the spine, leading to lower paraparesis and disruption of internal organs in the pelvis.

Spastic Erb's palsy - this form of the disease is characterized by progressive paresis of the legs in combination with high muscle tone, tendon reflexes, and a predominance of spastic over paretic phenomena.

Meningovascular neurosyphilis - develops against the background of damage to small capillaries, perivascular inflammation and endovasculitis. It is accompanied by intimal proliferation, inflammatory changes in the adventitia.

Meningovascular neurosyphilis occurs with a gradual narrowing of the vascular lumens, which significantly increases the risk of thrombosis and vascular occlusion.

Clinical presentation of neurosyphilis

The clinical presentation of neurosyphilis depends on the form of the disease, its severity, and the specific location of the lesion:

Acute syphilitic meningitis - accompanied by severe and persistent headache, neck spasms, stiff neck, drowsiness, photophobia, convulsions, vomiting, and confusion.

Syphilitic meningomyelitis can occur in acute, subacute, and chronic forms. It is characterized by paraparesis - a decrease in muscle strength in the lower or upper extremities, flaccid paralysis of the legs, urinary incontinence, and bedwetting.

Meningovascular neurosyphilis - the clinical picture depends on whether small or large vessels are affected, their number and exact location. The main symptoms are impaired blood circulation in the brain tissue, persistent headaches, attacks of dizziness and chronic insomnia.

Tabes dorsalis - its first manifestation is a decrease in sensitivity to mechanical vibrations affecting the skin, a violation of the ability to feel the body in space and control its movements.

Progressive paralysis - occurs 10-20 years after infection. It is accompanied by severe mental disorders, which are more severe than neurological disorders. Characteristic symptoms include progressive dementia, speech disorders, attacks of aggression and loss of self-criticism, depressive and manic states, delusions and hallucinations.

Syphilitic gumma is a rare type of neurosyphilis, characterized by impaired eye movement due to damage to the oculomotor nerves, persistent headaches, vomiting, impaired consciousness, and a state of psychomotor agitation.

One of the most common types of neurosyphilis is the congenital form. It is very rare, because during pregnancy women undergo many examinations and screenings. If intrauterine infection develops, its clinical picture is the same as the course of the disease in adults.

Diagnostic methods

When the first symptoms of neurosyphilis appear, you should consult a neurologist or dermatovenerologist. The doctor will examine the patient and prescribe all diagnostic measures:

reagin (nonspecific) antiphospholipid test;

specific treponemal test;

PCR for detection of Treponema pallidum DNA;

study of IgG antibodies to the causative agent of syphilis Treponema pallidum;

PCR of cerebrospinal fluid;

CT and MRI of the brain.

Differential diagnosis with sarcoidosis, vasculitis, meningitis, and malignant neoplasms is mandatory.

Treatment plan

Neurosyphilis is a serious and dangerous disease that can only be treated in a hospital setting with high doses of penicillin antibiotics for 14 days.

If the patient does not tolerate penicillin, cephalosporins are used. In case of damage to the eyelids and hearing organs, intravenous antibacterial therapy is performed.

However, within the first 24 hours after the start of therapy, the patient's condition may experience a short-term deterioration - fever, rapid heartbeat, severe headache, joint spasms, and changes in blood pressure.

To relieve symptoms, a course of anti-inflammatory drugs and glucocorticosteroids is prescribed. To assess the effectiveness of treatment, a study of the cerebrospinal fluid and an analysis of the clinical picture are performed.

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