

Brain-Invading Parasites

Almost a half of the world's population is infected with some form of parasites. **Parasites** are an integral part of every organism, and as such most of them do not cause any symptoms in the adult body. It may take several weeks or months before the onset of **flu-like symptoms, muscle pain,** and swelling of lymph nodes.

A very small percentage of infected people complain about **vision** and **eyesight problems**, while those with a weak immune system may experience **severe seizures** and **loss of coordination** - in this case we are dealing with dangerous **parasites that feed on the account of the human body.**

The Feline Parasite

Toxoplasmosis - **Toxoplasma gondi** - is one of the **most dangerous** neurological parasites. It can lay low in the human body for **more than a decade**, without any indications, but when it finally reaches the **brain**, it can radically change the behavior of its host. This cat-aclysm is usually transmitted by means of **cat feces**.

However, you may also get **toxoplasmosis** if you eat **undercooked foods** that contain larvae, **if you do not wash your hands regularly**, and sometimes even through **blood transfusion**.

Symptoms

This parasite rarely causes symptoms in otherwise healthy people. Sometimes it may cause a **flu-like** illness and **swollen lymph nodes**. Some of the more severe symptoms occurring in risk groups, such as HIV- positive people and **pregnant women** are:

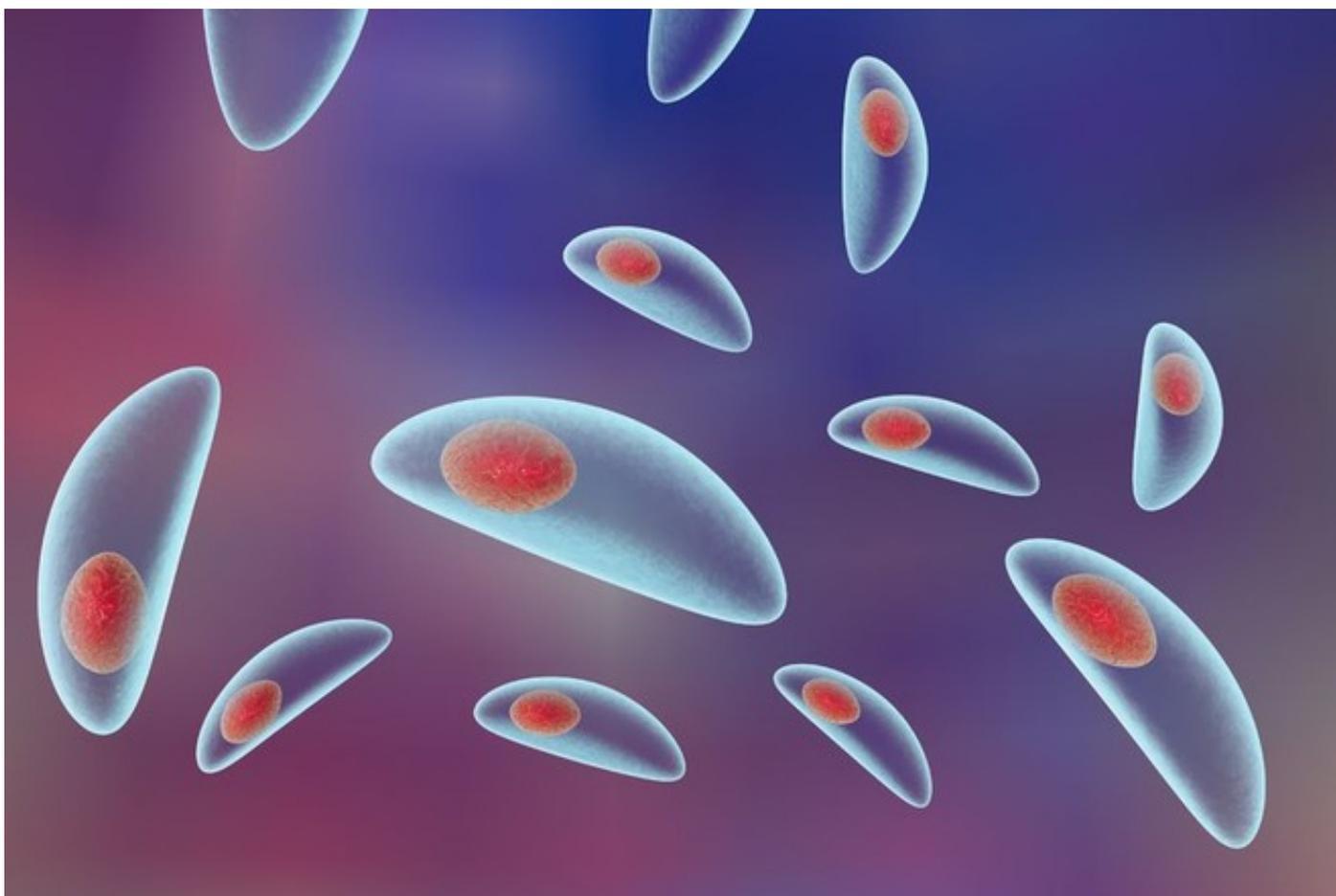
- high body temperature
- trembling
- mini-infarctions
- heart failure
- encephalitis (brain inflammation)
- retinochoroiditis
- lesions in the brain tissue of the fetus

When this parasite reaches a male brain, it can cause:

- reduced brain function
- reduction of psychomotor skills
- emotional instability
- schizophrenia

Diagnosis and Treatment

Diagnosis is performed by **testing blood** on antibodies or **serological tests** that diagnose the disease by antigen and antibody response. The treatment of toxoplasmosis is usually performed by a combination of two medications - **pyrimethamine** and **sulfadiazine**.



Sleeping Sickness

Sleeping sickness or **African trypanosomiasis** is caused by the parasites of the genus **Trypanosoma brucei**. The disease predominantly occurs in sub-Saharan Africa, whose population is the most exposed to the risk of illness due to inadequate hygiene and insufficient medical aid. It is estimated that around **500,000** people worldwide suffer from this illness, and about **9,000** of them die each year. The infamous carrier of this disease is the **tsetse fly**.

Symptoms

The **first symptoms** that occur within **three weeks** after the bite are:

- frequent headaches
- fever
- joint pain
- itching
- swollen lymph nodes

The second stage of the disease begins during the next few weeks or months, carrying along symptoms such as **confusion, poor coordination, the feeling of numbness, and sleep disturbances**. At this stage of the disease, patients are extremely **confused, they suddenly lose a lot of weight** and **suffer severe cramps**. Trypanosomes destroy the **central nervous system**, which results in a complete decay of the patient. The disease ends in a permanent sleep, which several months or years later leads to death.

Diagnosis and Treatment

Trypanosomiasis is diagnosed by **blood tests** in the presence of the causative agent. Sometimes a lumbar **puncture** is required to determine the stage of the disease. If the disease is discovered before the onset of **neurological symptoms**, it is easily treated. In the first stage, the disease is treated with **pentamidine** and **suramin**, and in the second stage with **eflornithine** and a combination of other medications in case of the infecting strain.



Brain-Eating Amoeba

Naegleria fowleri, colloquially called the "**brain-eating** amoeba" lives in stagnant freshwater, predominantly on the leaves of aquatic plants. It is extremely resistant and can survive cold, warm and dry weather.

This amoeba can be introduced into the human body by drinking **water of questionable quality**, bathing and scuba diving in ponds and lakes. Its main endeavor in the human body is to use the **central nervous system** to get to the brain, where it can feed on **brain cells** without a hitch.

Symptoms

The infected individuals begin to feel the **presence of the brain-eating amoeba** within **15 days**

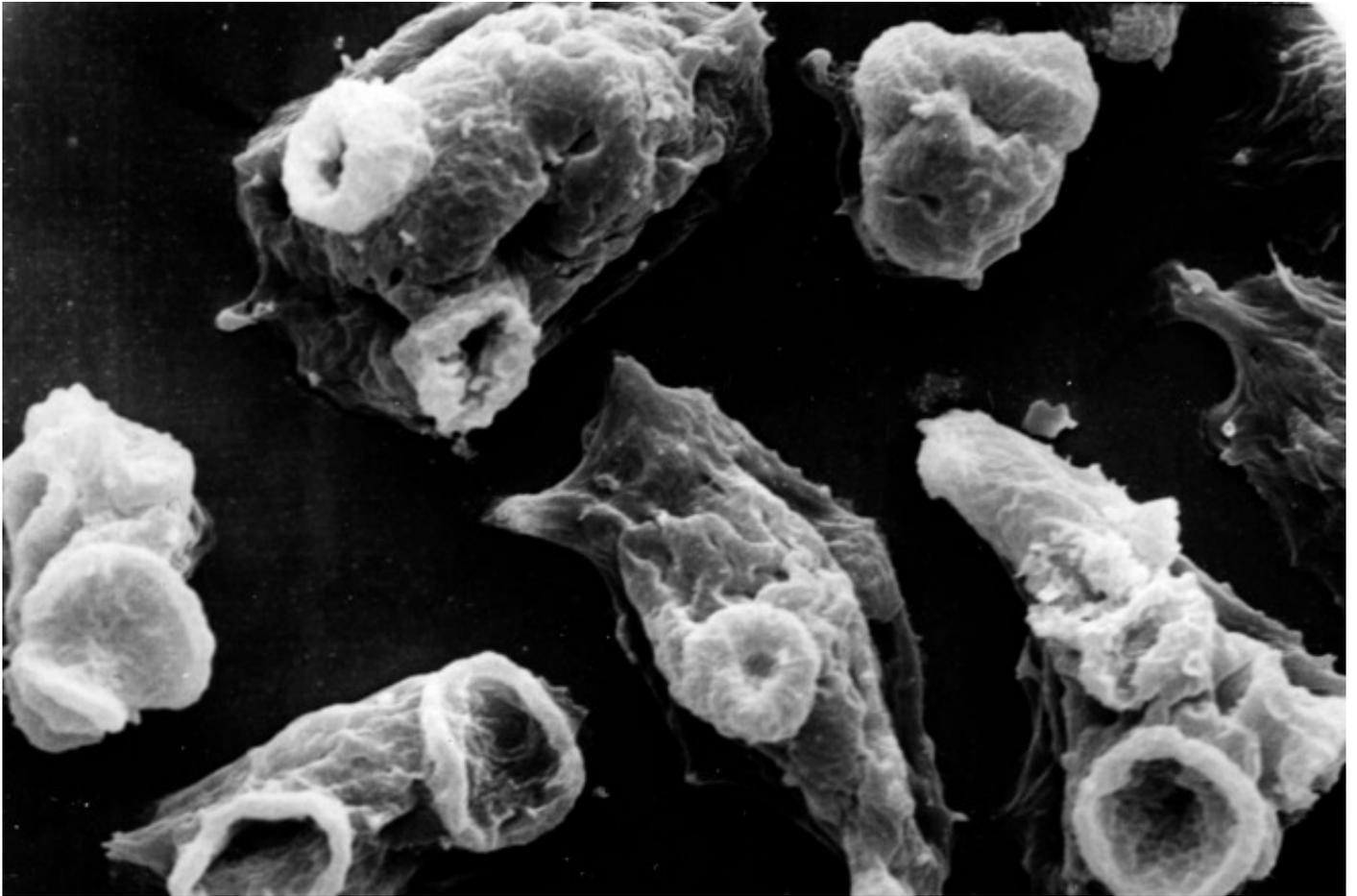
after the infection when the following **symptoms** appear:

- headaches and neck stiffness
- high body temperature
- loss of appetite
- changes in taste buds and sense of smell
- vomiting
- a sudden oscillation in behavior
- seizures and hallucinations
- blurred vision

More severe symptoms occur when the amoeba sets upon the cognitive brain structures about **3-5 days** after the onset of the symptoms. This type of infection is very rare, but almost always **deadly**.

Diagnosis and Treatment

Brain-eating amoeba can be **diagnosed** with the aforementioned **serological tests** and with computer tomography or magnetic resonance imaging. The biggest problem when it comes to treatment is the amoeba's progressive destruction of the human body. Most commonly used medications in its **treatment** are **iodoquinol**, **paramomycin**, **mebendazole** and **tinidazole**.



Pork Tapeworm

Pork tapeworm is a contagious intestinal disease with adult **Taenia solium**. This infection most commonly occurs in the US, Eastern Europe and Asia. People can get infected with the tapeworm by **accidentally swallowing** *Taenia solium* larvae, and by means of **contaminated food and water**. Once the larvae are swallowed, they travel through the **stomach** only to stop in the **small intestine**, where they begin to develop into adult **tapeworms**. They can grow up to 3 meters. People are usually **intermediate hosts**, meaning that in most cases the tapeworm does not reach adulthood in the intestines, but the **oncospheres**, after penetrating the intestinal walls, migrate to the **areas of internal organs and muscles**.

Symptoms

The symptoms mostly depend on the location of the larvae and appear months or even years after the infections. The most common **symptoms** associated with **cysticercosis** are:

- convulsions (epileptic seizures)

- headache
- confusion
- attention disorders
- loss of coordination
- hydrocephalus (excess fluid in the area surrounding the brain)

Very often, the tapeworm can cause **encephalitis** (brain inflammation) and **meningitis** (inflammation of the protective capsule covering the brain and spinal cord); if the resulting damage is severe, it leads to **death**.

Diagnosis and Treatment

The infection can be **diagnosed** by means of computer tomography or magnetic resonance imaging and **treated** with oral preparations of **niclosamide** and **praziquantel**. The best way to protect yourself from the tapeworm is through **proper treatment** of the food you eat. It is extremely important to make a **meat analysis** prior to its consumption because in this case you do not want to be **the early bird who catches the (tape)worm**.

Prevention is Better than Cure

The best way to ward off these parasites is to **maintain personal hygiene** and **adhere to health rules**. Pests can be transmitted from person to person so it is important to get tested at least once a year. Pharmaceutical remedies have been advanced enough to kill the parasites, but a **timely reaction** is always required.