

Toxoplasma gondii

Toxoplasma gondii is an **invasive intracellular element** in the **coccidia** . Its occurrence is cosmopolitan, the disease is one of the most common diseases. In the Czech Republic, over 20% of people are positive for specific antibodies.

Transmission

The definitive host is felines . An intermediate host can be any warm-blooded vertebrate (rodent, sheep, cattle or human). While tissue cysts occur in both types of host organisms, infectious oocysts produced by sexual reproduction of the parasite are found only in the definitive host. The infection is possible:

1. **alimentary**- foods that are contaminated with **oocysts** secreted with cat feces - insufficiently heat-treated meat containing **tissue cysts**
2. *transplacentally*
3. organ *transplants*

Stages of development

1. Tachyzoite

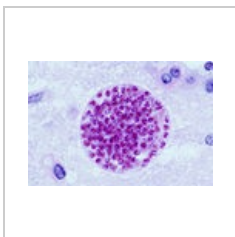
- = **pathogenic stage**
- strongly resembles a malarial plasmodium
- is *invasive* (enters cells)
- under certain circumstances it transforms to the *bradyzoite stage*

2. Bradyzoite

- they multiply slowly inside the cells without destroying them
- creates **tissue cysts** in immune privileged organs (brain , muscles , eye)
- infectious stage

3. Oocyst

- resting **infection stage**
- occurs in the intestines of infected cats → is *excreted in the faeces* (excreted only for a certain time, not for life)
- contains *sporozoites*
- lasts a year or more in the wild



Tissue cyst with bradyzoites



Immature oocyst



Mature oocyst

Life cycle

Definitive host

1. **the cat becomes infected** by ingesting meat containing tissue cysts or food contaminated with oocysts
2. the sporozoite / bradyzoite is converted to tachyzoite
3. tachyzoite attacks enterocytes (it is able to attack any **nuclear** cell)
4. **inside the cell it divides** rapidly until the cell is completely filled with tachyzoites
5. the cell **bursts**
6. tachyzoites are released **into the environment** and attack other nuclear cells
7. inside the cells, **immature** oocysts are formed, which are released into the lumen of the intestine during cell breakdown and excreted
8. the immature oocyst matures in a humid environment with air access to the **infectious oocyst** in 1-5 days

Interhost

1. the intermediate host (human) becomes infected by ingesting meat containing tissue cysts or food contaminated with oocysts
2. the sporozoite / bradyzoite is converted to tachyzoite
3. tachyzoites in its digestive tract pass **through the intestinal epithelium** and there is a hematogenous spread throughout the body → if it multiplies *constantly* : ***acute toxoplasmosis occurs***
4. by the reaction of the immune system, the tachyzoite inside the tissue cells changes to the **bradyzoite stage**
5. the cell changes into an infectious **tissue cyst** (= cell enlarged, completely filled with bradyzoites) → formation of *tissue cysts* : ***latent toxoplasmosis develops***

⚠ If tachyzoites penetrate **the placenta** : ***congenital toxoplasmosis develops*** (followed by fetal harm or miscarriage)

Toxoplasmosis

For more information, see *Toxoplasmosis* , *Congenital Toxoplasmosis* .

Links

Related articles

- Rizikové těhotenství a novorozeneček

External links

- *Toxoplasma gondii* (česká wikipedie)
- *Toxoplasma gondii* (anglická wikipedie)

References

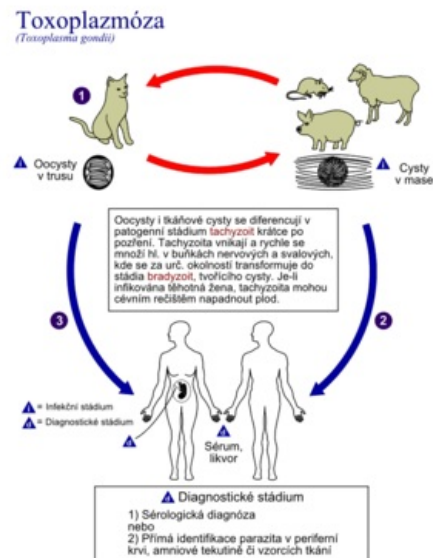
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- RNDr. Eva Nohýnková, Ph.D. [přenáška z parazitologie]

Reference

1. VOLF, Petr a Petr HORÁK. *Paraziti a jejich biologie*. 1. vydání. Praha : Triton, 2007. 318 s. s. 103–104. ISBN 978-80-7387-008-9.

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Life cycle of *T. gondii*