. ***Balantidium coli***

Balantidium coli are a protozoan parasite responsible for the disease Balantidiasis. *Balantidium coli* are the largest protozoan and the only ciliate known to parasitize humans and are known for being the largest protozoan parasite of humans.

Transmission

- *Balantidium coli* are transmitted by a fecal-oral route: humans are infected by ingestion of water or food contaminated by feces containing the protozoa (cystic stage).

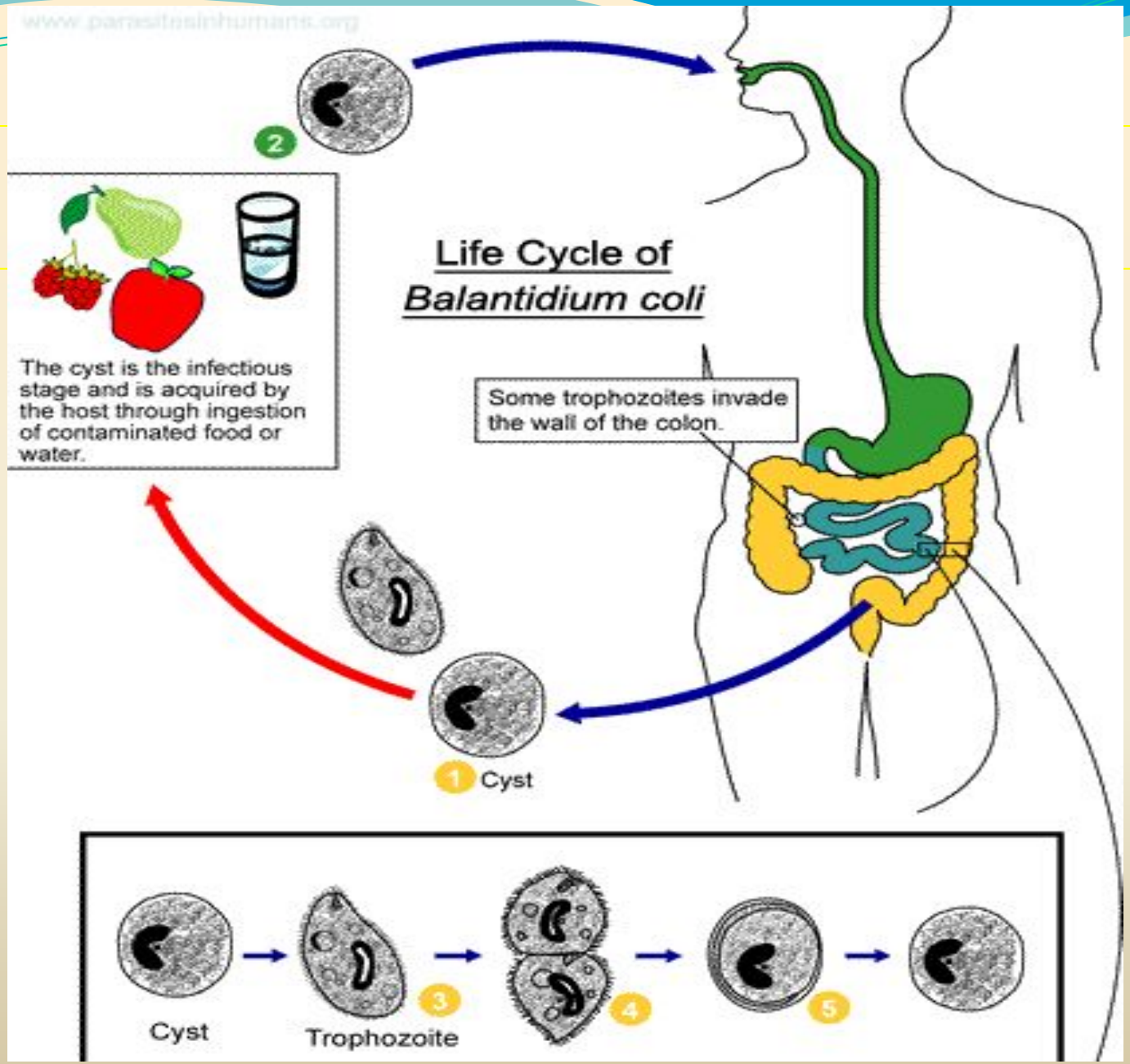
Balantidium coli most commonly infect humans, other primates, and pigs, which are reservoirs of the parasite. Infection is rare, but is likely to occur in places where humans live closely with swine and where water sanitation is poor .or non-existent

Morphology

Balantidium coli has two developmental stages as seen in a wet mount of a stool specimen.a trophozoite stage and a cyst stage.

1- In trophozoites, the organism is surrounded by cilia, the two nuclei are visible. The macronucleus is long and sausage-shaped, and the spherical micronucleus is nested next to it, often hidden by the macronucleus. The opening, known as the peristome, at the pointed anterior end leads to the cytosome, or the mouth. Trophozoites live in the large intestines and boring or rotary motility ,Trophozoites can measure between 50-130 µm long by 20-70 µm wide. *Balantidium coli* reproduces during the trophozoite stage either by asexual transverse binary fission or sexual conjugation.

2- Cysts are the infective stage of the *Balantidium coli* life and smaller than trophozoites, measuring 40-60 µm across and are round and have a tough, heavy cyst wall made of one or two layers. Usually only the macronucleus and sometimes cilia and contractile vacuoles are visible in the cyst. Living trophozoites and cysts are yellowish or greenish in color.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Life Cycle of
Balantidium coli
2
The cyst is the infectious stage and is acquired by the host through ingestion of contaminated food or water.
Some trophozoites invade the wall of the colon.
1 Cyst
Cyst
Trophozoite
3
4
5

- **Clinical Signs of Balantidiasis**
- *1-Balantidium coli* usually resides in the lumen of its host, trophozoites can invade the mucosa of the large intestine (cecum and colon) and cause ulcerations.
- 2- The parasite secretes a substance called hyaluronidase enzyme, which helps degrade intestinal tissue and facilitates penetration of the mucosa. Other bacteria in the intestine may enter the ulcer along with *Balantidium coli*, leading to secondary infections.
- 3- Common symptoms of Balantidiasis include chronic diarrhea, occasional dysentery (diarrhea with passage of blood or mucus), nausea, foul breath, colitis (inflammation of the colon), abdominal pain, weight loss, deep intestinal ulcerations, and possibly perforation of the intestine.
- 4- Fulminating acute Balantidiasis is when the disease comes on suddenly and with great intensity.

- Left untreated, it is reported to have a case fatality rate of 30%. Dysentery due to hemorrhaging (bleeding) can lead to shock and death.
- It is important to consider what other health conditions a patient might have that render them more susceptible to severe Balantidiasis: for example:
- other intestinal infections or parasites
- malnutrition
- alcoholism
- compromised immunity
- a history of chronic disabling diseases.
- Infection may be more likely and symptoms are definitely more severe in debilitated individuals.
- Unfortunately, poor overall health is a common trait of the populations most affected by *Balantidium coli*.
- The symptoms described are for the acute cases that appear when *Balantidium coli* is invasive. Most infections are asymptomatic. Still, asymptomatic individuals can transmit the disease, which highlights the importance of Public Health

Interventions.

- **Role in Disease**

Balantidium coli lives in the cecum and colon of humans, pigs, rats and other mammals. **It is not readily transmissible from one species of host to another because it requires a period of time to regulate to the symbiotic flora of the new host**. Once it has adapted to a host species, the protozoan can become a serious pathogen, especially in humans. Trophozoites multiply and encyst due to the .dehydration of feces

Diagnosis of Balantidiasis

Balantidiasis is an uncommon infection.

1- **Symptoms,** if present, include diarrhea, dysentery, and abdominal pain. Since these symptoms are non-specific and common to other conditions such as amebic dysentery or amebiasis, **a diagnosis of Balantidiasis must be made by microscopic examination of stool or tissue sample.**

2- A stool sample is collected and a wet mount is prepared. Cysts or trophozoites can be detected in the feces. As noted before, *Balantidium coli* are the largest protozoan and the only ciliate to parasitize humans. These traits can be of help when identifying organisms in samples from patients.

3- Trophozoites can also be detected in tissue. In order to collect a tissue specimen from the large intestine, **a sigmoidoscopy procedure** is used.

4- Balantidiasis should be considered if the patient works closely with pigs or other livestock, lives in or has recently traveled to a region with poor water sanitation, or has had contact with infected persons.

- **Treatment of Balantidiasis**
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- *Balantidium coli* infection can be treated effectively with antibiotics. Three drugs are commonly used and administered orally. They are listed below in order of recommendation.
- (1) Tetracyclines
- 500 mg four times daily for 10 days
- (Contraindicated in pregnant women and children younger than 8 years of age)
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- (2) Metronidazole
- 750 mg three times daily for 5 days
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- (3) Iodoquinol
- 640 mg three times daily for 20 days