Trichomoniasis

https://doi.org/10.56238/sevened2024.001-039

Paulinisia de Carvalho Braga, Mirelly de Oliveira Pedrosa Santos, Maria Clara Teodoro Silva, Janaina Sousa Campos Alvarenga and Ângela Cardoso de Alvarenga

ABSTRACT

Among the various known parasitic diseases, trichomoniasis draws attention because it is the most common non-viral sexually transmitted infection (STI) worldwide. According to the World Health Organization's (WHO) Global Health and Strategies Report on HIV, viral hepatitis and STIs, trichomoniasis, syphilis, gonorrhea and chlamydia together cause more than one million infections per day.

Keywords: Diseases, Trichomoniasis, Sexually Transmitted Infection (STI).

INTRODUCTION

Among the various known parasitic diseases, trichomoniasis draws attention because it is the most common non-viral sexually transmitted infection (STI) worldwide. According to the World Health Organization's (WHO) Global Health and Strategies Report on HIV, viral hepatitis and STIs, trichomoniasis, syphilis, gonorrhea and chlamydia together cause more than one million infections per day.

Trichomoniasis is an infection that affects the human urogenital tract. Although less than 20% of infected women show symptoms, the parasite can cause vulvovaginitis and, in more severe cases, pelvic inflammatory disease. It is estimated that between 14% and 60% of the partners of infected women also harbor the parasite, but usually without symptoms.

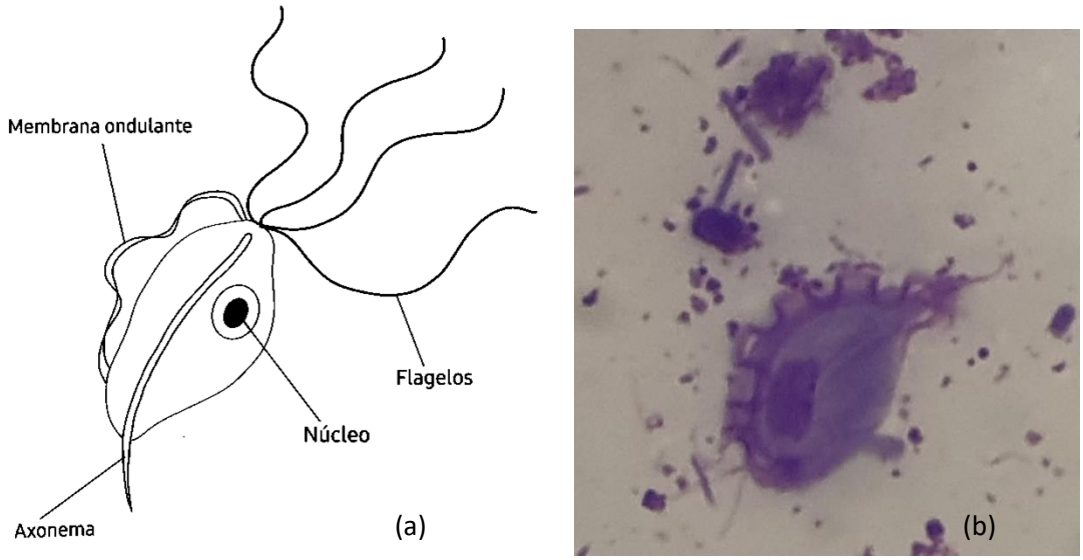
ETIOLOGIC AGENT

Trichomoniasis is caused by the protozoan *Trichomonas vaginalis*, first described in 1836 by Alfred François Donné, a French bacteriologist and physician, who isolated it from the vaginal discharge of a woman with vulvovaginitis.

There is no consensus on the taxonomic position of the genus *Trichomonas*. In the most recent classification, which does not follow the traditional hierarchical structure of phyla, classes, and orders, *Trichomonas* is a member of a group of flagellated protozoa known as *Parabasalia*. The genus *Trichomonas* comprises monoxenous flagellated protozoa, with four anterior flagella, an undulating membrane, and a complex cytoskeleton. Among the existing species, *Trichomonas vaginalis* is considered the most relevant in human infections.

The protozoan *Trichomonas vaginalis* consists of a polymorphous cell that can be ellipsoid, oval, and sometimes spherical. It has four free anterior flagella, unequal in size, that originate in the anterior basal granular complex (cytosomal complex). This is also where the undulating membrane originates, the free margin of which is made up of an accessory filament that connects to the recurrent flagellum. The nucleus assumes an ellipsoidal shape near the anterior end, possessing a double membrane and often featuring a small nucleolus. Figure 1 shows a schematic drawing of the trophozoite of *Trichomonas vaginalis* (a) and an optical microscopy photograph (b).

Figure 1: (a) Schematic representation of *Trichomonas vaginalis trophozoite*. (b) Optical mycoscopy photography – 100x magnification.



Source: (a) Prepared by the authors. (b) Authors' personal collection.

Trichomonas vaginalis is a facultative anaerobic organism, so it can multiply in the absence of oxygen, in culture media with pH between 5.0 and 7.5, at temperatures that can vary from 20°C to 40°C. It uses some carbohydrates as its main source of energy. Being devoid of mitochondria, it has dense granules (hydrogenosomes) which are structures containing enzymes capable of transforming pyruvate into acetate, releasing ATP. It has the ability to store glycogen as an energy source, an important adaptation that ensures its survival for a certain time in the event of changes in the environment.

EVOLUTIONARY FORMS

Contrary to what occurs in most protozoa, the *Trichomonas vaginalis* It does not have the cystic form, but only the trophozoitic form, which is its infective form. The multiplication of trophozoites occurs by longitudinal binary division.

FORMS OF CONTAMINATION

Or *Trichomonas vaginalis* It is mainly transmitted through unprotected sex, but also through the sharing of contaminated fomites. In addition, contamination can occur during the passage through the birth canal, when the infected mother has not undergone prophylactic measures against parasitosis during pregnancy, or when she has not yet started treatment, because she is asymptomatic. However, it may not be necessary to treat mildly symptomatic trichomoniasis in the first few weeks of life, because in the baby the infection tends to be self-limiting.

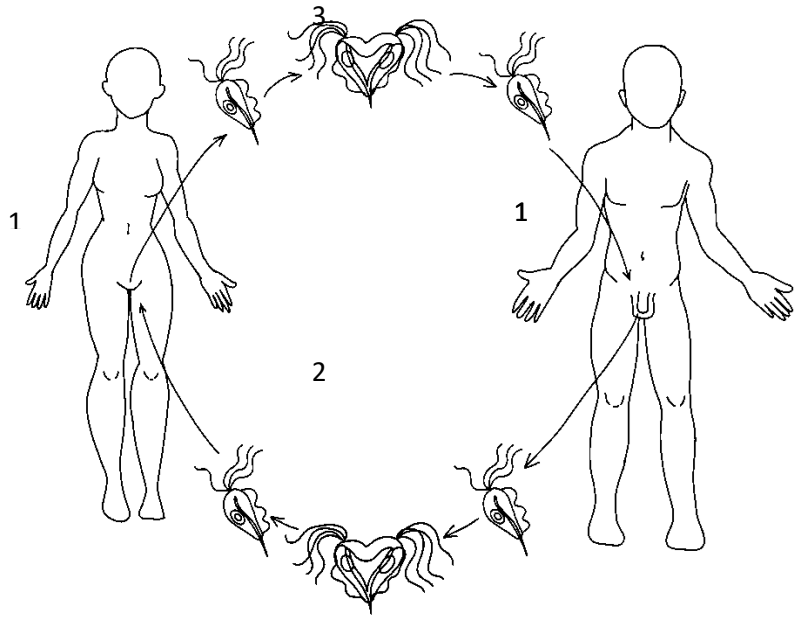
Trichomoniasis is uncommon in girls up to 10 years of age, as vaginal conditions in childhood do not favor the development of parasitosis. Thus, when found in the child, the origin of the infection

should be carefully investigated, ascertaining the possibilities of both sexual abuse and other sources of infection. However, from the age of 10, trichomoniasis is more likely to result from sexual transmission.

BIOLOGICAL CYCLE

The perpetuation of the parasite depends on its survival in the human host, since the *Trichomonas vaginalis* It is a protozoan with a monoxenic biological cycle. Because it does not have a cystic form, it is susceptible to desiccation and high temperatures; However, it is able to survive outside its habitat for a few hours under favorable humidity conditions - it can live for three hours in collected urine and for six hours in ejaculated semen. Figure 2 shows the graphical representation of the parasite's evolutionary cycle.

Figure 2: Graphic representation of the biological cycle of *Trichomonas vaginalis*, which resides in the female lower genital tract and in the male urethra and prostate (1), where it replicates by binary fission (2 and 3).



Source: Prepared by the authors.

CLINICAL FORMS

Or *Trichomonas vaginalis* It has a remarkable localization specificity, being able to cause infections only in the human urogenital tract, not settling in the oral cavity or intestine. The incubation period of this infection can range from three to twenty days.

In women, trichomoniasis can manifest in a wide range of symptoms, ranging from asymptomatic to acute. Trichomoniasis causes vaginitis, characterized by a profuse greenish-yellow vaginal discharge with blisters and a foul odor, often seen in the postmenstrual period. In addition, the infectious process is usually accompanied by vulvovaginal itching or irritation of varying intensity, pain in the lower abdominal region, and vulvar discomfort. Women may experience pain

and difficulty in sexual intercourse (dyspareunia), painful urination (dysuria), and increased urinary frequency (polyuria). In the presence of the infection, the vagina and cervix may have erosions and bleeding spots, a condition known as macular colpitis or strawberry-like cervix. Trichomoniasis tends to be more symptomatic during pregnancy or in women who use oral contraceptives. As complications in women, *Trichomonas vaginalis* may increase the likelihood of human immunodeficiency virus (HIV) infection; it is a cause of low birth weight in neonates, as well as premature births; and it may predispose infected women to pelvic inflammatory disease (PID), cervical cancer, and infertility.

Trichomoniasis in men is usually asymptomatic, or may manifest as urethritis with milky or purulent discharge and a mild itching sensation in the urethra. In the morning, before urinating, a clear, viscous discharge may be observed, often accompanied by discomfort when urinating and sometimes hyperaemia of the urethral meatus. In asymptomatic carriers, the parasite remains in the urethra and sometimes in the prostate. Some complications associated with this organism include prostatitis, balanoposthitis, and cystitis. *Trichomonas vaginalis* can, in more severe cases, be located in the bladder and seminal vesicles.

DIAGNOSIS

The diagnosis of trichomoniasis cannot depend exclusively on its clinical presentation, as the signs and symptoms can be easily confused with those of other sexually transmitted infections. If clinical evaluation were used as the sole diagnostic criterion, about 88% of infected women would go undiagnosed, while approximately 29% of uninfected women would be misidentified as carriers of the infection. Therefore, laboratory investigation methods should be used to confirm the diagnosis.

In the diagnosis of urogenital trichomoniasis, the most frequently used laboratory procedures include direct parasitological examination of fresh specimens and fixed and stained smears, as well as culture methods.

For the laboratory investigation to be successful, men must collect the first urine in the morning, without the ingestion of any trichomonicide drug in the last fifteen days. The urine will be centrifuged and the sediment placed on a slide for observation and search for the protozoan (direct parasitological examination).

On the other hand, women should not perform vaginal hygiene in the 18 to 24 hours prior to the collection of the material, and should also abstain from the use of trichomonicide drugs for fifteen days. The sample is typically collected from the vagina using a *Swab* of non-absorbent cotton or polyester, with the aid of an unlubricated speculum. After the collection of the *Swab*, part of the material is placed on a slide for direct observation under a microscope and the rest is placed in culture medium for evaluation after 24 hours.

Although not the objective of the technique, the Papanicloau examination may show the presence of *Trichomonas vaginalis* in the analyzed sample, which will be recorded in the result. Thus, annual screening for cervical cancer prevention may indirectly allow the diagnosis of trichomoniasis.

TREATMENT

According to the Clinical Protocol and Therapeutic Guidelines for Comprehensive Care for People with Sexually Transmitted Infections (STIs), published by the Ministry of Health in 2022, the first treatment option for trichomoniasis (including pregnant and breastfeeding women) consists of the oral administration of 5 tablets of Metronidazole 400mg, in a single dose (total dose 2g), or 2 tablets of Metronidazole 250mg, administered twice a day, for seven days (daily dose of 1g). The protocol recommends that sexual partners should be treated with the same therapeutic regimen. People living with HIV should be treated with the usual regimens, paying attention to the drug interaction between metronidazole and ritonavir, which can increase the intensity of nausea and vomiting, reducing adherence to antiretrovirals. To avoid this, the protocol recommends a two-hour interval between intakes of metronidazole and ritonavir.

PROPHYLAXIS

Trichomoniasis is mainly transmitted through unprotected sexual intercourse and, therefore, control and prevention measures are similar to those adopted in the fight against other sexually transmitted infections. Among the recommended strategies for prevention, the following stand out: the practice of safe sex, with the use of condoms; abstinence from sexual contact with infected people; the non-sharing of fomites; and the prompt and effective administration of treatment, both for symptomatic and asymptomatic cases. In addition, simultaneous treatment is recommended for sexual partners, even if the disease has been diagnosed in only one of the members of the couple. In addition to the preventive measures mentioned above, the importance of health education for the vulnerable population is highlighted.

REFERENCES

1. Cavasini, C. E. (2021). Trichomonas vaginalis e a Tricomoníase. Parasitologia contemporânea. Rio de Janeiro: Guanabara-Koogan. Disponível em: <https://edisciplinas.usp.br/pluginfile.php/7364413/mod_resource/content/1/Tricomoniase_09.pdf>. Acesso em: 10 out. 2023.

2. Centers for Disease Control and Prevention - DPDx - Laboratory Identification of Parasites of Public Health Concern. (s.d.). Trichomoniasis. Disponível em: <https://www.cdc.gov/dpdx/trichomoniasis/index.html>. Acesso em: 10 out. 2023.

3. Lima, M. C. L. et al. (2013). Prevalência e fatores de risco independentes à tricomoníase em mulheres assistidas na atenção básica. Acta Paulista de Enfermagem, 26, 331-337.

4. Maciel, G. P., Tasca, T., & De Carli, G. A. (2004). Aspectos clínicos, patogênese e diagnóstico de Trichomonas vaginalis. Jornal Brasileiro de Patologia e Medicina Laboratorial, 40, 152-160.

5. Ministério da Saúde. (2022). Protocolo Clínico e Diretrizes Terapêuticas para Atenção Integral às Pessoas com Infecções Sexualmente Transmissíveis (IST). Brasília: Ministério da Saúde. Disponível em: <https://www.gov.br/aids/pt-br/central-de-conteudo/pcdts/2022/ist/pcdt-ist-2022_isbn-1.pdf>. Acesso em: 10 out. 2023.

6. Neves, D. P. (2016). Parasitologia Humana (13a ed.). São Paulo: Atheneu.

7. Organização Mundial da Saúde. (2022). Global health sector strategies on, respectively, HIV, viral hepatitis and sexually transmitted infections for the period 2022-2030. Genebra: Organização Mundial da Saúde. Disponível em: <https://iris.who.int/bitstream/handle/10665/360348/9789240053779-eng.pdf?sequence=1>. Acesso em: 10 out. 2023.

8. Pessoa, S. B. (1942). Tricomonas vaginalis. Revista de Medicina, 26(104), 7-16.

9. Rey, L. (2009). Bases da Parasitologia Médica (3a ed.). Rio de Janeiro: Guanabara Koogan.

10. Van Gerwen, O. T., & Muzny, C. A. (2019). Recent advances in the epidemiology, diagnosis, and management of Trichomonas vaginalis infection. F1000Research, 8.

11. Van Gerwen, O. T. et al. (2021). Epidemiology, natural history, diagnosis, and treatment of Trichomonas vaginalis in men. Clinical Infectious Diseases, 73(6), 1119-1124.