Trichomonas Vaginalis
Metronidazole Resistance

T. vaginalis is a flagellated, anaerobic protozoan and is the most common non-viral sexually transmitted pathogen. Approximately half of female T. vaginalis infections are asymptomatic (1), as are most male infections. Symptomatic infections manifest as Trichomoniasis with symptoms of discharge (yellow, green or gray, sometimes frothy), odor, itching, and pain during urination and/or intercourse. Signs of infection include small red ulcerations on the vagina and/or cervix, positive amine (whiff) test and elevated pH. Wet-mount microscopy of a vaginal swab often reveals white blood cells and rapidly motile trichomonads. However, detection of trichomonads by microscopy has a sensitivity of only 60%-75% (2) whereas polymerase chain reaction (PCR) can detect T. vaginalis with a sensitivity of 85%-100% (3). Trichomoniasis is associated with a number of serious clinical complications, as pregnant women with Trichomoniasis are at increased risk for pre-term labor and delivery of low birth weight neonates (4, 5). In addition, Trichomoniasis is associated with HIV transmission (6, 7). Patients are normally treated with a single oral dose of metronidazole, an antibiotic used to treat infections caused by anaerobic bacteria and parasites. Although generally effective, some T. vaginalis strains are resistant to metronidazole. If metronidazole treatment fails, the only other approved treatment for Trichomoniasis is the related drug tinidazole. Therefore, identifying Trichomoniasis resistance to metronidazole can help guide clinicians in prescribing effective therapy for Trichomoniasis patients.

Pathogenesis

- T. vaginalis attaches to the vaginal epithelium and several T. vaginalis adhesins have been identified that mediate this binding (12).
- After binding, T. vaginalis triggers detachment of cells through proteolytic activity, cytotoxicity and apoptosis. (3).
- Patients infected with T. vaginalis produce circulating (IgG) and secreted (IgA) antibodies that recognize adhesins and prevent parasite adhesion; however, protection is only short-term as re-infection rates as high as 30% have been observed (3).

Laboratory Diagnosis

- A cervico-vaginal specimen can be submitted for laboratory testing to detect T. vaginalis. Detection of trichomonads by PCR has a sensitivity of 85%-100% (3).
- Currently, only the Centers for Disease Control and Prevention (CDC) can determine metronidazole susceptibility for T. vaginalis. A viable culture of T. vaginalis must be received, using a specialized collection and transport device.
- Medical Diagnostic Laboratories can now detect metronidazole resistance in a subset of T. vaginalis specimens by Real-Time PCR. Our current assay detects a mutation that encodes a K80STOP change in the Tvntr6 protein, and has 40% sensitivity, 96% specificity, and a 91% positive predictive value (PPV) for the detection of T. vaginalis metronidazole resistance. This test was developed using 100 well-characterized T. vaginalis isolates from the CDC.

Clinical Benefits of Testing

- The OneSwab® platform allows for the detection of T. vaginalis and associated metronidazole resistance in cervico-vaginal specimens.
- Detection of metronidazole resistance can assist clinicians in administering effective treatment for Trichomoniasis patients.
- Benefits of this system include: The use of highly sensitive and specific Real-Time PCR technology,
simple and convenient sample collection, no refrigeration required before or after collection, specimen viability up to five (5) days, test additions available up to 30 days and 24-48 hour turnaround time.

Treatment Considerations

- First-line therapy is a single 2 gram dose of oral metronidazole.
- If initial therapy fails, and re-infection can be excluded, the patient can be treated with 500 milligrams of oral metronidazole twice per day for 7 days.
- If treatment is still not effective, consider using oral metronidazole or tinidazole, 2 grams per day for 5 days.
- Patients should avoid alcohol during metronidazole or tinidazole treatment, as well as for 24 hours after the end of metronidazole treatment and 72 hours after the end of tinidazole treatment.
- If treatment is still unsuccessful, contact the CDC for a consultation.

Frequently Asked Questions (FAQ)

- What does a positive result mean for the detection of the Tvntr6 K80STOP mutation? A positive result indicates a >90% likelihood that the *T. vaginalis* present in the specimen exhibits some degree of resistance to metronidazole. It is not known if this level of resistance is associated with clinical failure to metronidazole treatment.
- What does a negative result mean for the detection of the Tvntr6 K80STOP mutation? As our current assay only detects 40% of resistant *T. vaginalis* isolates, a negative result is inconclusive. It does not mean that the *T. vaginalis* in question is susceptible or resistant to metronidazole.

References


