

Review Article

Trichomonas Vaginalis: A Review of Its Epidemiologic, Clinical and Treatment Challenges in Nigeria

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Abstract: *Trichomonas vaginalis* is a flagellated parasite that causes sexually transmitted infections mainly in women. The disease found with other sexually transmitted infections such as Chlamydia, Gonorrhoea, Syphilis and Herpes simplex virus type II is a sensitive marker of highly sexual behaviour. It causes pelvic inflammatory disease and adverse pregnancy outcomes. The parasite, *T. vaginalis*, causes Trichomoniasis, a disease with significant medical, social and economic implications. The data presented in this report showed that Trichomoniasis caused by *T. vaginalis* remains the only reported sexually transmitted parasitic disease in Nigeria. The progressive abandoning of condom use relative to discomfort and linked to forgetting the risk of *Trichomonas vaginalis* and the increase of poverty may partially explain the increase in the annual number of urogenital trichomoniasis cases in Nigeria. Metronidazole has been the treatment of choice for women for decades, and single dose has been considered the first line of therapy. However, high rate of retest positive are found among *T. vaginalis* infected person after single dose of Metronidazole treatment. Evidence from the review indicates the need for the concern stakeholders to attempt a holistic approach towards eradicating the disease in our environment.

Keywords: *Trichomonas vaginalis*, Infections, Metronidazole, Parasitic disease.

INTRODUCTION

Trichomoniasis is a very common sexually transmitted disease (STD) especially for women, caused by infection with a motile protozoan parasite called *Trichomonas vaginalis* and cause vaginal discharge for women as well as increasing of dysuria [1-3]. Humans are the only known host with the trophozoite transmitted via vaginal sexual intercourse, and rarely via fomites [4]. Infected people without symptoms can still pass the infection to others. The parasite is passed from infected persons to uninfected ones during sex. In women, the most commonly infected part of the body is the lower genital tract (vulva, vagina, or urethra), and in men, the most commonly infected body part is the inside of the penis [5]. During sex, the parasite is usually transmitted from a penis to a vagina or from a vagina to a penis [1, 6]. Transmission of *Trichomonas vaginalis* to neonates during passage through an infected birth canal is also possible [7, 8]. *Trichomonas vaginalis* in men causes itching or irritation inside the penis, burning after urination or ejaculation, or some discharge from the penis. *Trichomonas vaginalis* in women causes itching, burning, redness or soreness of the genitals, discomfort with urination, or a thin discharge with an unusual smell that can be clear, white, yellowish, or greenish [1, 3].

Based on wet mount microscopy sensitivity, the World Health Organization [3] estimated the global prevalence, ranges from 60-80 % [9]. In women, vaginal swabs have been shown to have a higher sensitivity than first catch urine but in men, either first catch urine or urethral swab is recommended [10]. Trichomoniasis can increase the risk of getting or spreading other sexually transmitted infections.

EPIDEMIOLOGY

Trichomoniasis is very rare among sexually inactive girls and virgins (usually below the age 14), but at its peak between sexually active group (20 to 40). In males the incidence is between 21 to 30 years. Infection can range from months, years and life-long infection.

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Incidence average 10% in normal population and incidence varies with age, marital status and race. Incidence is high in overcrowded areas compared to less crowded areas. Estimates of the world wide prevalence of trichomoniasis range from 170-180 million cases annually [11].

In Africa, it is estimated that 2-50% of the populations carry the infection [12]. The disease has important medical, social and economic implications, this implies that Africans or persons of African descent have higher rates of *T. vaginalis*, as evidenced by higher rates in Sub-Saharan Africa [13, 14], and among persons of African descent such as Garifunas [15] and African Americans in the US [16, 17]. In the United States, the highest prevalence of *T. vaginalis* infection in US women is seen among African-Americans with rates ranging from 13–51% [18]. African American women have rates that are ten times higher than white women, constituting a remarkable health disparity [16]. Other risk factors for *T. vaginalis* include increased age, incarceration, intravenous drug use, commercial sex work [19] and the presence of bacteria vaginosis [20]. There is a higher prevalence of trichomoniasis among pregnant women than non-pregnant women [21].

In sexually active women, the prevalence of *T. vaginalis* infection is relatively high [7]. In males, *T. vaginalis* infection is generally asymptomatic. Asymptomatic carriers can serve as vectors for the disease, making it important to treat male partners. The parasite resides in the female's lower genital tract and the male urethra and prostate. In other words, women are at greater risk of contacting the infection than their male counterparts and are mainly reservoirs while males disseminate the parasite [22].

Reports from Nigeria suggest that, trichomoniasis could be higher in urban areas than in the rural communities [23, 24]. For example, in a study carried out by Obiajuru and Ogbulie [25], a higher prevalence of *T. vaginalis* was documented for residence in urban areas (57.70%) than those living in rural communities (39.16%). Also, prevalence was highest amongst the sexually active group of age 11-45 years old [26]. Amongst pregnant women, *T. vaginalis* is generally high [7, 27]. In Zaria, pregnant women between ages 16 to 25 were reported to be *T. vaginalis* positive with prevalence of 53.57% [28]. In South-West Nigeria, *T. vaginalis* prevalence in Lagos and Abeokuta was recorded as 1.8% and 21.3% respectively for pregnant women aged 20-30 years. Meanwhile in Anambra, South-East Nigeria, non-pregnant women had higher rate of infection (17.8%) than pregnant ones (16.7%) [29]. Furthermore, a study in Maiduguri showed a high rate of 20.8% infection among non-pregnant women [30]. In relation to marital status, a prevalence of 2.9% was recorded among Lagos married women compared to 0.4% prevalence in unmarried women [28]. Amadi and Nwagbo [26] reported 19.72% for single women in Abia, South-East, Nigeria with 21.6% and 11% among Abeokuta and Maiduguri married women respectively [30, 31].

CLINICAL PRESENTATION

While *T. vaginalis* is usually isolated from the vagina, *T. vaginalis* can also infect the urethra and Skene's gland. The infection, once established, may persist for long periods in women. Asymptomatic *T. vaginalis* infections are well documented; up to 25 to 50% of infected women do not show clinical signs [32]. However, women can also develop symptoms that may be cyclic and often become worse during menstruation. Among women with culture-proven *T. vaginalis* infection, only 11 to 17% present abnormal discharge, odor, pruritus, dysuria, or vaginal burning [33]. During trichomoniasis, the vaginal pH increases to 7 [34], this is favourable to parasite growth. The fact that trichomoniasis symptoms are worse during menstruation can be explained by changes in pH and hormones. It was proved that the activity of cell detaching factor is inhibited by estrogen [35]. Furthermore, menstrual blood creates a rich medium with a high concentration of iron at a higher pH. Consequently, *T. vaginalis* reproduction and attachment to the vaginal epithelium are promoted, resulting in the worsening of symptoms [36]. Even if trichomoniasis usually remains localized in the lower part of the urogenital area, it can occasionally provoke adnexitis or pyosalpinx and may potentially have serious sequelae in women, especially during pregnancy [32].

DIAGNOSIS

Diagnosis is usually by demonstrating the flagellates in vaginal discharge examined under the microscope. This should be stained with Geimsa stain which shows up the organelles clearly. Sometimes microscopic examination may be negative even when there is infection, it may be necessary to carry out *invitro* cultivation of the discharge. Historically, detection of the parasite is made possible by examination of urine and High Vaginal Swab (HVS) in a drop of saline or trichomonas diluents for the characteristics wobbling and rotating motion. Amadi and Nwagbo [26] reported that either urine sample or vaginal swab is insufficient for proper diagnosis of *T. vaginalis* infection and have suggested that for better result, both urine and swab should be used.

According to Hobbs and Sena [37], new molecular diagnostics tests with improved sensitivity have been developed in response to the increasing recognition by stakeholders of importance of the wide-spread of trichomoniasis. This detection of *T. vaginalis*, including rapid antigen detection and nucleic acid amplification tests, has significantly improved the quality of diagnostics for trichomoniasis, particularly in women.

PREVENTION AND CONTROL

Trichomoniasis majorly transmitted through sexual intercourse, prevention and control in the spread of the disease can be checked by reduction in sexual promiscuity. Control and elimination depend largely on proper sex education, especially for adolescent and youth [26, 30]. Both sex partners should be treated same time to prevent reoccurrence. Partners status should be known, the cost of treatment should not be high in other for infected persons to avail themselves for treatment. Since trichomoniasis can also be transmitted due to sharing of towels, toilet (W.C); proper hygiene should be maintained.

TREATMENT

Oral treatment with Metronidazole (Flagyl) gives almost 100% cure rates within a short period, and there is little or no side effect. Metronidazole belongs to the 5-nitroimidazole drug family, and it and related compounds such as tinidazole (TNZ) and secnidazole are reported to have about a 95% success rate in curing *T.vaginalis* [38].

TREATMENT CHALLENGES IN NIGERIA

Treatment among Pregnant/ Lactating Women

Metronidazole being a class B drug and with meta-analyses is been found to be safe in pregnant women at every stage of pregnancy [39, 40]. Tinidazole have not yet been evaluated in pregnant women. World Health Organization (WHO) does not recommend treatment in the first trimester unless it is indicated for prevention of untoward birth outcomes. Both Centre for Disease Control and suggest 2g dose [5, 41].

Allergies to Metronidazole and Tinidazole

Persistent *T.vaginalis* is usually treated with multi-dose metronidazole and tinidazole. This multi-dose is accompanied with reactions like urticaria and facial edema. Others include flushing, fever and anaphylactic shock from immediate-type hypersensitivity. More so, multi-dose is recommended for the treatment of HIV-infected women and is found that antiretroviral therapy may interfere with the efficacy of metronidazole among HIV-infected women [42, 43].

Non-Treatment of sex partner

For treatment to be effective and sound, both partners should be treated. But in the situation where one is treated and the other not treated brings about re-infection and this is same as not treating at all.

CONCLUSION

The progressive abandoning of condom use relative to discomfort and linked to forgetting the risk of *T. vaginalis* and the increase of poverty in Nigeria may partially explain the increase in the annual number of urogenital trichomoniasis cases. In addition, drug resistance emergence and intolerance to nitroimidazoles contribute to making trichomoniasis treatment a societal challenge to be addressed. Because of this, chemotherapy and vaccines are the best ways to control the expansion of this cosmopolitan disease. Besides *in vitro* screening of new compounds, all strategies that attempt to improve the biodistribution of anti-*Trichomonas* compounds provide real added value to the fight against this disease. In particular, approaches consisting of the prevention of side effects linked to parenteral treatments need to be prioritized. Thus, any investigation with the aim of developing local treatments is promising.

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