EDITORIAL COMMENTARY

Trichomoniasis in Adolescents: A Marker for the Lack of a Public Health Response to the Epidemic of Sexually Transmitted Diseases in the United States

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(See the article by Van Der Pol et al., on pages 2039–44.)

Despite being a readily diagnosed and treated sexually transmitted disease (STD), trichomoniasis is not reportable in the United States, and control of trichomoniasis has received relatively little emphasis from public health STD control programs, including that of the Centers for Disease Control and Prevention. More recently, however, appreciation of high rates of disease and of associations between trichomoniasis in women and both adverse pregnancy outcomes and an increased risk of HIV infection have suggested a need for increased control efforts.

Trichomoniasis is caused by the parasite Trichomonas vaginalis. The annual incidence of T. vaginalis infection in the United States has been estimated at 7.4 million cases, with >180 million cases worldwide [1]. The World Health Organization has estimated that this infection accounts for almost one-half of all curable STDs worldwide [2]. The prevalence of trichomoniasis in women attending inner-city STD clinics in the United States typically approaches 25% and may be higher in certain populations [3, 4]. In Los Angeles, California, for instance, the prevalence in black attendees at a public clinic was found to be 38% [5]. Rates of T. vaginalis infection in men are largely unknown, because of the poor sensitivity of the currently available diagnostic techniques for men. Recent studies using more-sensitive polymerase chain reaction (PCR)–based techniques have found that, in some populations, rates of T. vaginalis infection in men may equal those of chlamydia infection [6].

In this issue of the Journal of Infectious Diseases, Van Der Pol et al. report astonishingly high rates of trichomoniasis in a cohort of 14–17-year-old adolescent women at high risk for STDs in Indianapolis, Indiana [7]. Women were entered into a longitudinal study and were tested at quarterly intervals using PCR techniques. Of the 268 participants, 6.0% were infected with T. vaginalis at enrollment. More revealing was that, during the course of the study, >23% of the participants had at least 1 episode of T. vaginalis infection, and >31% had multiple episodes.

In women, T. vaginalis infection may cause vaginal discharge, irritation, and inflammation. In men, it is usually asymptomatic but is becoming increasingly recognized as a cause of nongonococcal urethritis. Diagnosis of T. vaginalis infection in women is usually accomplished via direct microscopic examination of vaginal fluid; however, even when performed by skilled microscopists, the sensitivity of this technique is only 60% [8]. Most clinics do not screen asymptomatic women for T. vaginalis infection, even though it is well documented that up to one-half of cases are asymptomatic [9]. Culture media are commercially available, and culture is currently the reference standard for diagnosis in women [10]; however, culture is not routinely used because of the cost and because of the laboratory complexity rating, as determined by the Clinical Laboratory Improvement Act. There is currently no commercially available PCR test. In general, diagnosis is much more difficult for men—culture for men clearly lacks sensitivity, as is shown by comparison with results for PCR [11]. Thus, the currently available T. vaginalis infection testing methods that are affordable for use in public health settings are inadequate in terms of sensitivity.

In most patients, trichomoniasis is easily treated with a single dose of metronidazole, which represents the most affordable treatment for any STD [12]. As with any STD, treatment of sex partners is rec-
ommended; however, it is estimated that relatively few male partners receive treatment. Current partner notification efforts consist of provision of information to the index case regarding self-referral of sex partners, with the reminder that most of these men are asymptomatic.

Long considered to be a minor STD with few associated complications, several studies have recently implicated trichomoniasis as a cause of preterm delivery. In a large multicenter study, after adjustment for demographic, behavioral, and microbiological variables, _T. vaginalis_ infection was found to be significantly associated with low birth weight, premature rupture of membranes, and preterm delivery (relative risk, 1.4) [13]. In another study, the incidence of premature rupture of membranes at term was 27.5% in women with trichomoniasis as a cause of preterm delivery, and preterm delivery (relative risk, 1.4) [13]. In another study, the incidence of premature rupture of membranes at term was 27.5% in women with _T. vaginalis_ infection, versus 12.8% in uninfected women (P<.03) [14]. In pregnant adolescents, _T. vaginalis_ infection was found to be independently associated with prematurity and low birth weight [15].

Prospective studies of treatment of trichomoniasis during pregnancy for the prevention of preterm birth have yielded disappointing results. In a cohort of women with asymptomatic infection who were treated with metronidazole during the second and third trimesters of pregnancy, a trend toward increased preterm delivery was seen, compared with that in the placebo group. However, the dose of metronidazole used was 4 times that of the recommended dose, and some women in the placebo group were treated off study by their physicians. In addition, the study was stopped prematurely because of the slow rate of accrual of subjects and the trend toward an increased risk of preterm delivery in the treatment group [16]. A second study, conducted in Uganda, also found that treatment of trichomoniasis during pregnancy resulted in an increase in preterm birth. However, this study was actually a subgroup analysis of a larger trial and was not properly designed to answer the question of the effect that treatment of _T. vaginalis_ infection during pregnancy has on preterm birth [17]. Therefore, decisions concerning clinical practice should not be based on available studies; better-designed studies are needed to address this important question.

HIV infection has been associated with trichomoniasis in several studies conducted in Africa, possibly as a result of local inflammation often caused by the parasite. Leroy et al. found a significant difference in the prevalence of trichomoniasis between the HIV-infected and the HIV-uninfected women in a cohort of pregnant women in Rwanda (20.2% vs. 10.9%; _P_ = .0007) [18]. In a prospective study, multivariate analysis showed that incident trichomoniasis was significantly associated with HIV seroconversion (odds ratio, 1.9) in a cohort of women in Zaire [19]. The association between HIV acquisition and trichomoniasis may be related to increased susceptibility to HIV infection as a result of the macro- or microscopic breaks in mucosal barriers caused by _T. vaginalis_ infection [20]. Given that most studies conducted to date have found a higher prevalence and incidence for trichomoniasis than for most other treatable STDs, the fraction of HIV acquisitions attributable to trichomoniasis may eclipse the relative contributions of other STDs [5].

Transmission of HIV is also enhanced by coinfection with _T. vaginalis_. In a study conducted in Malawi, among men with urethritis, the median seminal fluid HIV RNA concentration was significantly higher in those with _T. vaginalis_ infection than in those with symptomatic urethritis resulting from an unidentified cause, and successful treatment of trichomonal urethritis reduced the concentration of HIV RNA in seminal fluid to levels similar to those seen in uninfected control subjects [21]. This increased viral shedding in the genital tract of men infected with _T. vaginalis_ likely significantly contributes to HIV transmission.

Despite the continued high number of cases and the potential complications of infection, trichomoniasis continues to be largely ignored as a public health issue. The only venues in which screening for this infection is routinely performed is in public health STD clinics, and the screening test used is the vaginal wet-mount preparation, which has limited sensitivity. Successful control of STDs is greatly aided by the use of sensitive screening tests, treatment of infected sex partners, accurate reporting of cases, and the availability of effective, affordable, single-dose medication. To date, only the latter is available for trichomoniasis. The development of inexpensive, easy-to-perform diagnostic tests for trichomoniasis in men and women, as well as the initiation of mandatory reporting (as for other STDs), should be given high priority.

STDs remain the most common reportable communicable diseases in the United States. That other industrialized nations have STD rates that are significantly lower than ours should continue to be seen as a failure of our public health system and an embarrassment to our nation [22, 23]. Although reported cases of chlamydial infection and gonorrhea and have decreased over the past decade, public health STD control programs, which are chronically underfunded and understaffed, are now dealing with new epidemics of syphilis in both heterosexual and homosexual populations [24]. It is ironic that the most common curable STD, trichomoniasis, has never been deemed to be important in terms of STD control efforts. As Van Der Pol et al. point out, STDs continue to affect our youth at alarming rates [7] and cost the taxpayers millions of dollars for associated complications. It is time for our nation to take action against our epidemic of STDs—and to acknowledge that young people are sexually active and that condoms are effective in preventing many cases of STDs [25, 26]. The use of condoms for STD prevention should be promoted, not discouraged. Furthermore, significant increases in funding are needed to upgrade our public health STD clinics, so that more diagnoses can be made and more treatment can be pro-
vided. We need to interrupt the cycle of STDs and strive to control and ultimately eliminate curable STDs from the US population, especially our young people.

References