

Frequency of Trichomoniasis in Patients Admitted To Outpatient Clinics in Hamadan (2007) and Relationship between Clinical Diagnosis and Laboratory Findings

Soghra Rabiee^{a*}, Mohammad Fallah^b, Fatemeh Zahabi^c

^a Department of Obstetrics and Gynecology, Fatemeh Women Hospital, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

^b Department of Parasitology, School of Medicine, Hamadan University of Medical Science, Hamadan, Iran

^c General Practitioner

ARTICLE INFO

Article history:

Received: 27 May 2009

Revised: 17 April 2010

Accepted: 26 April 2010

Available online: 20 June 2010

Keywords:

Trichomoniasis
Prevalence
Clinical diagnosis
Iran

*Corresponding author:

Rabiee S. (MD)

Tel: +98 918 1111050

E-mail addresses:

rabieesogol@yahoo.com

ABSTRACT

Background: Trichomoniasis is recognized as a major sexually transmitted disease (STD) in the world and has the highest prevalence and incidence of STD. The prevalence strongly is related to cultural and social norms in different societies, in relation to sexual partnership, monogamy, or polygamy. Our objective was to describe the frequency and natural history of infection and correlation of clinical signs with parasite detection.

Methods: From February 2006 to March 2007, in a cross sectional study, clinical and wet mount examination of vaginal smear along with culture were performed on 683 women attending to private outpatient clinics in Hamadan, western Iran. Trichomoniasis was diagnosed based on major clinical symptoms. Diagnosis was confirmed using wet mount microscopically and culture in Diamond medium.

Results: Only 2.2% of patients with clinically diagnosed trichomonal vaginitis were positive for *Trichomonas vaginalis* by wet smear and culture. The mean age of patients was 33.6±9.7 yr, and majority of them were married and non-pregnant. Some (5 patients) infected cases were divorced and others (7 patients) husband were car driver. There was not statistically significant relationship between clinical diagnosis and laboratory findings ($P>0.5$), because the most of patients diagnosed trichomoniasis, were infected by *Candida* or other vaginal infections.

Conclusion: Because of special cultural background, the vaginal trichomoniasis has minor importance problem in this population and clinical diagnosis is not efficient for treatment decision.

Introduction

For more than a century following its initial description in 1836, *Trichomonas vaginalis* was considered either a harmless vaginal colonizer or simply a minor nuisance [1]. More recently, it has been recognized that *T. vaginalis* infection may be associated with a range of adverse reproductive health outcomes, including preterm birth [2-4], cervical neoplasia [5, 6], post-hysterectomy infection [7], atypical pelvic inflammatory disease [8, 9], and infertility

[10]. The parasite also is a major cause of vaginitis, cervicitis, urethritis and pelvic inflammatory disease in women and may cause nongonococcal urethritis, prostatitis, and perhaps other lower genitourinary tract syndromes in men [11]. In recent years, it has been appreciated that *Trichomonas* may play a critical role in amplifying human immunodeficiency virus (HIV) transmission [12].

While there is continued debate about the causal linkage between *T. vaginalis* infection and obstet-

rical, gynecological, and infectious complications, it is generally recognized that the incidence of this sexually transmitted infection (STI) has reached epidemic levels in many regions worldwide. In 1999, the World Health Organization (WHO) estimated the global incidence of *T. vaginalis* infection to be 173 million cases annually, making this parasite the most common cause of non-viral STI [12]. The greatest burden of disease was observed in less developed regions, but a high incidence was also found in North America (8 million cases annually) and Western Europe (11 million cases annually) [13, 14].

Because the increasing changes of the social norms in developing countries, such as Islamic Republic of Iran, epidemiologic studies of STDs is an essential need for evaluating the health importance of these infections and notice them in clinical practice. Our objective was to describe the frequency of *T. vaginalis* infection in a relatively traditional society and, its relationship with clinical symptoms. Because clinical symptoms associated with vaginitis are various and result in misdiagnosis, the clinical diagnosis alone is often deceptive. Therefore, second objective of this study was to evaluate the accuracy of clinical diagnosis in comparison with laboratory findings.

Materials and Methods

In this cross sectional descriptive study, a total of 683 women admitted to public and private gynecology clinics evaluated for *T. vaginalis* infection by clinical examination, direct wet mount and culture methods. Chief complain, signs and symptoms of patients recorded, and vaginal swab samples from distal fornix were obtained during clinic visit and vaginal examination. One swab were examined by direct wet mount method prepared by saline normal, and other swab sample cultured in Diamond medium. Direct wet mount prepared and examined immediately in clinic by an expert technician. Cultured tubes were kept in an incubator with 37° C temperatures and examined microscopically after 24 h. For negative cultures results, fresh medium were added in the tubes and kept for one 48 h more. Only the patients diagnosed as having trichomoniasis on the basis of clinical signs and symptoms, compared with the results of wet mount examination and cultured vaginal specimens (in terms of being positive for *T. vaginalis*).

Results

The age range of study population was 15 through 68 yr. Majority (32%) of them was educated in high school and 88.7% were homemakers. The chief complaint of patients was vaginal discharge, itching, burning, and chafing. About 8.7% of patients mentioned the history of trichomoniasis (diagnosed clinically) and were already treated for this infection.

Trichomonas vaginalis infection was identified in 2.2% (15/683) of the patients in both wet mount and cultured samples; however, 4.4% (30/683) patients had symptoms related to trichomonal infection. The most of patients (31%) had discharge and itching that diagnosed *Candida* sp in the stained vaginal smears. A striking finding was the infected individuals were divorced and were supporting by charity institutions or, here husband were truck driver (Table 1). There was not significant relationship between clinical diagnosis and laboratory findings, because most of patients' diagnosed trichomoniasis, were infected to *Candida* or other vaginal infections.

Table 1: Laboratory findings of 683 patients initially diagnosed as trichomoniasis

Laboratory findings	Number	Percent (%)
<i>Trichomonas vaginalis</i>	15	2.2
Trichomonal symptoms	30	4.4
<i>Candida</i> sp	212	31
Abnormal discharge	198	29
Normal discharge	228	33.3
Total	683	100

Discussion

This study indicated that trichomoniasis is not a major problem, at least in some parts of Iran, especially in the traditional societies. However, some reports from other parts of Iran have shown higher prevalence of trichomoniasis in the at risk groups, such as women taken in prison [15]. Totally, trichomoniasis reported from as low as 0.46% to as high as 33.7% in different parts of Iran [15, 16]. The differences in the prevalence of trichomoniasis between societies and sub-populations almost cleared by various epidemiologic studies, but some minor differences in social norms can influence on trichomoniasis [11]. Bacterial vaginosis and *Candida* vulvovaginitis

are responsible for 90% of cases of vaginitis. Many cases of bacterial vaginosis are asymptomatic or present with only malodorous vaginal discharge and no inflammatory complaints. Therefore, many vaginal infections diagnosed trichomoniasis clinically, can be bacterial vaginosis [17].

This result of this study is comparable with reports from some other Islamic countries for example Libya that reported a 1.2% prevalence of trichomoniasis (29/2450) from Benghazi City [18-22]. Another study conducted in Saudi Arabia Kingdom reported a prevalence of 28% (10967/39049 patients) trichomoniasis among total STDs recorded during 6 yr in a traditional society [23]. Prevalence of trichomoniasis infection is different in the various parts of Iran. For example, prevalence of trichomoniasis infection is 17% (12/141) in Zahedan [24], 9.9% (100/1010) in Kashan [25], 10.75% (43/400) in Bandar Abbas [26], 1.37% (275/19530) in Chaharmahal and Bakhtiari Province [15], 9% in Kerman [27] and, 5.6% in Mashad [28]. Majority of studies conducted in the gynecology clinics or mother and child health centers that could be considered as representative of general population of women.

Most of epidemiologic studies of trichomoniasis conducted on females and in the gynecology clinics, because of known risk factors and easy access to target population [29-33]. Recently, in some developed countries the incidence of trichomoniasis infection is decrease by hard intervention and control measures such as health education, mass screening, and treatment of confirmed cases in high-risk groups [34].

In considering how a public health response to *T. vaginalis* might be implemented, a number of important questions must be addressed. For example, who would be screened and at what intervals? What type of testing should be used? What approaches would be most effective for case reporting and ensuring partner treatment? While the answers to these questions are beyond the scope of this article, it is worth noting that the essential tools for *T. vaginalis* control are already available. A range of diagnostic tests, including vaginal saline wet mount microscopy, culture, rapid antigen testing, and nucleic acid amplification and detection, provide alternatives that could be used in a

variety of settings [35]. Oral metronidazole and tinidazole offer inexpensive, effective, and generally well-tolerated treatment options that are widely available [1]. This study was limited to those patients who were admitted to some selective gynecology clinics. Therefore, these patients might not be the representative of general population of the women in Hamadan Province.

Conclusion

This study indicated that trichomoniasis infection is not noticeable, as much as other organisms such as *Candida* sp., thus, other bacterial vaginosis must come to attention.

Acknowledgements

This work was partially supported by Research Department of Hamadan University of Medical Science grant, hereby gratefully acknowledged. We gratefully acknowledge Miss Karimkhani and Mrs. Habibi for assistance in specimen's collection and parasite culture. We also thank all patients for kindly cooperation. The authors declare that they have no conflicts of interest.

References

- Schwebke JR and Burgess D. Trichomoniasis. *Clin Microbiol Rev.* 2004; **17**:794-803.
- Cotch M F, Pastorek JG, Nugent RP, Hillier SL, Gibbs RS, Martin DH, et al. Trichomonas vaginalis associated with low birth weight and preterm delivery. *Sex Transm Dis.* 1997; **24**:353-60.
- Minkoff H, Grunebaum AN, Schwarz RH, Feldman J, Cummings M, Crombleholme W, et al. Risk factors for prematurity and premature rupture of membranes: a prospective study of the vaginal flora in pregnancy. *Am J Obstet Gynecol.* 1984; **150**(8):965-72.
- Hardy PH, Hardy JB, Nell EE, Graham DA, Spence MR, Rosenbaum RC. Prevalence of six sexually transmitted disease agents among pregnant inner-city adolescents and pregnancy outcome. *Lancet.* 1984; **2**:333-7.
- Zhang ZF, Begg CB. Is Trichomonas vaginalis a cause of cervical neoplasia? Results from a combined analysis of 24 studies. *Int J Epidemiol.* 1994; **23**:682-90.
- Yap EH, Ho TH, Chan YC, Thong TW, Ng GC, Ho LC, Singh M. et al. Serum antibodies to Trichomonas vaginalis in invasive cervical cancer patients. *Genitourin Med.* 1995; **71**(6):402-4.

7. Soper DE, Bump RC, Hurt WG. Bacterial vaginosis and trichomoniasis vaginitis are risk factors for cuff cellulites after abdominal hysterectomy. *Am J Obstet Gynecol.* 1990;**163**:1016-21.
8. Moodley P, Wilkinson D, Connolly C, Moodley J, Sturm AW. Trichomonas vaginalis is associated with pelvic inflammatory disease in women infected with human immunodeficiency virus. *Clin Infect Dis.* 2002;**34**:519-22.
9. Sherman KJ, Chow WH, Daling JR, Weiss NS. Sexually transmitted diseases and the risk of tubal pregnancy. *J Reprod Med.* 1988; **33**:30-4.
10. Grodstein F, Goldman MB, Cramer DW. Relation of tubal infertility to history of sexually transmitted diseases. *Am J Epidemiol.* 1993;**137**:577-84.
11. Krieger JK. Trichomoniasis In: Warren KS and Mahmoud AAF, editors. *Tropical and geographical medicine.* 2nd edition, New York: McGraw- Hill; 1990.
12. Shafir SC, Sorvillo FJ, Smith L. Current issues and considerations regarding trichomoniasis and human immunodeficiency virus in African-Americans. *Clin Microbiol Rev.* 2009;**22**(1):37-45.
13. Ağaçfidan A, Kohl P. Sexually transmitted diseases (STDs) in the world. *FEMS Immunol Med Microbiol.* 1999;**24**(4):431-5.
14. Johnston VJ, Mabey DC. Global epidemiology and control of Trichomonas vaginalis. *Curr Opin Infect Dis.* 2008;**21**(1):56-64.
15. Dibadji R, Rezaian M. Prevalence and Parasitologic and serologic diagnosis of Trichomoniasis in the central prison of Tehran. 1st Iranian Congress for Parasitology; 1999 December 11-13; Rasht, Iran.
16. Sadeghi M, Manoochehri K. Trichomoniasis prevalence among women admitted to public health centers of Chaharmahal and Bakhtyari province for annual Pap smear test (1995-1996). *Shahrekord University of Medical Science' Journal.* 2001;**3**(3): 37-41(Farsi).
17. Scott JR, Gibbs RS, Karlan BY, Haney AF. Danforth's obstetrics and gynecology. 9th Edition, Philadelphia, Williams & Wilkins, 2003.
18. Kassem HH, Majoud OA. Trichomoniasis among women with vaginal discharge in Benghazi City, Libya. *J Egypt Soc Parasitol.* 2006;**36**(3): 1007-16.
19. Mahafzah AM, Al-Ramahi MQ, Asa'd AM, El-Khateeb MS. Prevalence of sexually transmitted infections among sexually active Jordanian females. *Sex Transm Dis.* 2008;**35**(6):607-10.
20. Malkawi SR, Abu Hazeem RM, Hajjat BM, Hajjiri FK. Evaluation of cervical smears at King Hussein Medical Centre, Jordan, over three and a half years. *East Mediterr Health J.* 2004;**10**(4-5):676-9.
21. Selvitopu A, Özçelik S, Değerli S. The incidence of Trichomonas vaginalis in vaginal specimens from gynecologic patients. *Turkiye Parazitoloj Derg.* 2006;**30**(3):175-7.
22. Culha G, Hakverdi AU, Zeteroğlu S, Duran N. Investigation of the prevalence of Trichomonas vaginalis in women with complaints of vaginal discharge and itching. *Turkiye Parazitoloj Derg.* 2006;**30**(1):16-8.
23. Madani TA. Sexually transmitted infections in Saudi Arabia. *BMC Infect Dis.* 2006;Jan 10, **6**:3 (eJournal).
24. Shabestari S: evaluation of para-clinic methods in diagnosis of Trichomoniasis in the women admitted to outpatient clinics of Qods hospital of Zahedan 1382 [MD thesis]. Zahedan, Zahedan University of Medical Science; 2004.
25. Rasti S, Taghriri A, Behrashi M: Trichomoniasis in the women admitted to Shabihkhani Hospital, Kashan 1381. *Feyz.* 2003;**7**(26):21-28
26. Shahi A: Prevalence and predisposing factors of Trichomoniasis in the women admitted to urban health centers of Bandar Abbas [MD thesis]. Tehran, Tehran University of Medical Science; 1997.
27. Akbari MR, Rezaian M. Study of Trichomons vaginalis infection in the patients admitted to health centers and Jihad Laboratory of Mashad. 1st Iranian Congress for Parasitology; 1999 December 11-13; Rasht, Iran.
28. Sharifi I, Tadayon Tahmasbi S. Prevalence of Trichomonas vaginalis in the patients with leukuhrea admitted to gynecologic clinics of Kerman. *Nabz,* 1994; **4**(6): 7-13
29. Mondal NI, Hossain K, Islam R, Mian AB. Sexual behavior and sexually transmitted diseases in street-based female sex workers in Rajshahi City, Bangladesh. *Braz J Infect Dis.* 2008;**12**(4):287-92.
30. Wang H, Wang N, Jia M, Bi A, Wang G, Ding G, Lin L, Smith K. Sexually transmitted infections among female sex workers in Kaiyuan city, Yunnan province, China: potential for HIV transmission. *Sex Transm Infect.* 2009;**85**(4):290-5.
31. Shahmanesh M, Cowan F, Wayal S, Copas A, Patel V, Mabey D. The burden and determinants of HIV and sexually transmitted infections in a population-based sample of female sex workers in Goa, India. *Sex Transm Infect.* 2009;**85**(1):50-9.
32. Cwikel JG, Lazer T, Press F, Lazer S. Sexually transmissible infections among female sex

- workers: an international review with an emphasis on hard-to-access populations. *Sex Health*. 2008;**5(1)**:9-16.
33. Hagan JE, Dulmaa N. Risk factors and prevalence of HIV and sexually transmitted infections among low-income female commercial sex workers in Mongolia. *Sex Transm Dis*. 2007;**34(2)**:83-7.
34. Sutton M, Sternberg M, Koumans EH, McQuillan G, Berman S, Markowitz L. The prevalence of *Trichomonas vaginalis* infection among reproductive-age women in the United States, 2001-2004. *Clin Infect Dis*. 2007;**45(10)**:1319-26.
35. Pillay A, Lewis J, Ballard RC. Evaluation of XenoStrip-Tv, a rapid diagnostic test for *Trichomonas vaginalis* infection. *J Clin Microbiol*. 2004;**42(8)**:3853-6.