
Trichomonas vaginalis used as a marker for other sexually transmitted infections in women

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Abstract:

Background: Vaginitis constitutes one of the most common problems in clinical medicine, and it is one of the main motives that lead women to see an obstetrician or gynecologist. Bacterial vaginosis, candidiasis and trichomoniasis are responsible for 90% of the cases of infection.

Objectives: This study sheds light on using *Trichomonas vaginalis* as a risk marker for other sexually transmitted diseases such as *Neisseria gonorrhoeae* and *Candida albicans*.

Material & Methods: Three high vaginal swabs were taken from 250 adult women attending the department of gynecology in AL-Yermouk Teaching Hospital with symptoms of heavy vaginal discharge. They were examined during the period extending from December 2005 to June 2006; then the swabs were cultured in three types of media according to the type of microorganism diagnosed, so for *T. vaginalis* Cysteine peptone liver maltose (CPLM) is used, sabouraud's dextrose agar media is used for *Candida albicans* and chocolate agar media is used for *N. gonorrhoeae* diagnosed.

Results: Fifteen women (6.0%) of the women infected with *T. vaginalis*, had at least one other sexually transmitted infection. The prevalence of gonorrhoeae in women with trichomoniasis is 33.3%, while the prevalence of *C. albicans* with trichomoniasis is 40%.

Conclusion: The results indicate that trichomoniasis vaginitis in women is frequently associated with other vaginal pathogen.

Key word: *T. vaginalis*, *N. gonorrhoeae*, *candida albicans*, vaginitis, sexually transmitted diseases.

Introduction:

Vaginal discharge is very common complaint in the out patient settings. Some of these conditions may be inadequately investigated and incorrectly treated. Accurate microbiological diagnosis of the cause of the discharge was important for the treatment. Infection with *Trichomonas vaginalis*, *Neisseria gonorrhoeae* and *Candida albicans* were usually associated with vaginitis^[1, 2]. *Trichomonas vaginalis* is a protozoan parasite that afflicts an estimated 5 million woman in the United States^[3] and 180 million people world wide are infection annually^[4]. Also *Candida albicans* vaginitis is an important gynecological infection. Despite therapeutic advances, vaginal candidiasis remains one of the most common problems worldwide affecting all society strata^[5]. *Neisseria gonorrhoeae* is also a sexually transmitted organism, gonococci adhere to epithelial cells, penetrate them and multiply in the basement membrane and about 75% of the infected women have no symptoms^[6]. The aim of this study is the possibility of using *T. vaginalis* as a risk marker for other sexually transmitted diseases.

Material & Methods

Specimens: Three high vaginal swabs were taken from 250 adult females attending the department of Gynecology in AL-Yermouk Teaching Hospital with symptoms of heavy vaginal discharge. They were examined during the

period extending from December 2005 to June 2006. The ages of patients ranges between 18-52 years. The swabs sent to the department of Bacteriology lab in diabetic center in AL-Mustansiriya University for an evaluation of *T. vaginalis*, *Candida albicans* and *N. gonorrhoeae*. This was done by two methods:

1-Direct examination: place the specimen on two glass slides and mix with a drop of saline. Cover the first one with cover slip and examined microscopically at 10x and 40x to detect yeast cell (*C. albicans*) and the *T. vaginalis* by identifying the Jerky movement. The second glass slide is stained by Gram stain for identifying pus cells, and intracellular gram negative diplococci (*N. gonorrhoeae*).

2-Culturing in artificial media: There are three types of media used for microorganism diagnosis and these types of media depend on the types of microorganism diagnosis.

a-Cysteine peptone liver maltose (CPLM): The cotton swab was immersed into a small bijou bottle containing CPLM media (Himedia). The bottle was incubated at 37° C and then was checked for the presences of the parasite after 24 hours. Then after one day up to 7 days a drop from the culture was taken by using a sterile micropipette, spread on a slide, covered by a cover slip and then examined under low and high powers of light microscope for 5-10 minutes. Then the result was interpreted after 7 days of

incubation. If no *Trichomonas* have been observed it was considered to be negative for *T. vaginalis* [7].

b-Sabouraud's dextrose agar media: The swab was inoculated onto sabouraud's dextrose agar medium, and incubated aerobically at 37° C for 24-48 hours. The colonies of *Candida albicans* appeared as medium -sized colonies, cream colored, smooth and pasty [8].

Chocolate agar medium: The same swab was inoculated onto chocolate agar plate and incubated in a candle Jar at 37° C for 24-48 hours. The plates were then examined for the colonies of *N. gonorrhoeae* which are translucent, mucoid raised colonies [8].

Results:

From 250 women patients that were examined, 15 women had infection with *Trichomonas vaginalis* giving an incidence of 6.0%; 34 patients were infected with *Candida albicans* with an infection rate of 14% and 7 patients (2.8%) were positive for *Neisseria gonorrhoeae* (Table 1).

Also the presence of infection with more than one type of organism was reported. The distribution of different types of microorganisms according to their association with *T. vaginalis* infection was shown in table 2.

It was found that out of 15 patients with *T. vaginalis* infection (6.0%). Six (40%) of them were infected with *C. albicans* and 5(33.3%) was found to be associated with *N. gonorrhoea*.

Table (1): The distribution of the organism among women with heavy vaginal discharge.

organism	No. of patient	Infection percent %
<i>Trichomonas vaginalis</i>	15	6.0
<i>Candida albicans</i>	35	14
<i>Neisseria gonorrhoeae</i>	7	2.8

Table (2): The presence of co- infection among 15 women with *T. vaginalis* infection.

Organism	No. of patient	Infection percent
<i>Candida albicans</i>	6	40
<i>Neisseria gonorrhoeae</i>	5	33.3

Discussion:

The human vagina is inhabited by a complex and varying population. The past effort was made to identify a single pathogen organism to account for specific infection ^[9], while Kent ^[10] reported that co-infections with two or more organisms occur in 15-20%. So patients with trichomoniasis have been associated with intravaginal pathogens ^[11].

Also the results in this study indicates that all women with trichomoniasis had co- infections with other sexually transmitted pathogen such as *Candida albicans* and *Neisseria gonorrhoeae*. In spite of the highest infection rate by candidiasis (14%).

The highest rate of combined infection was seen in infected cases with *T. vaginalis* and *N. gonorrhoeae* (33.3%) more than between *T. vaginalis* and *C. albicans* (40%) this is due the difference in the local environmental requirement mainly the vaginal pH. Since *C. albicans* is unlike *T. vaginalis* which favors the growth in more acidic medium of pH<4-5 ^[12]. Also some believed that the occurrence of *T. vaginalis* and *N. gonorrhoeae* in vaginal infection may be secondary to several factors that influence the epidemiology of both organisms, the number of sex partners, contraceptive practice and sexual preference contributed to the incidence of both organisms ^[13].

The results in this study agreement with other studies when they suggested that *T. vaginalis* has been viewed as a risk marker for sexually transmitted agents such as *Neisseria gonorrhoeae*, *Chlamydia trachomatis* and *Gardnerella vaginalis* ^[14]. Reynold & Wilson ^[15] they regarded that the *Trichomonas* was useful marker for other asymptomatic sexually transmitted infections such as *gonorrhoeae* and *Chlamydia* in women. Also *Trichomonas vaginalis* was considered a risk factor in transmitting human immunodeficiency virus (AIDS) ^[16,17]. Other studies have been demonstrated an association with *T. vaginalis* and come in pregnancy, including premature delivery and low birth weight infants [18, 19], while Zhang et al., [20] they suggested that the *T. vaginalis* used as a risk factor for developing cervical cancer.

References:

- 1-Yavuzdemfer, S.; Bengisum, S. and Gungor, C. Prevalence of *G. vaginalis*, mycoplasma, ureaplasma, *T. vaginalis* and *N. gonorrhoeae* in women with vaginal discharge. *Microbiol Bull.*, 1992; 26:139-148.
- 2-Edwards, L. The diagnosis and treatment of infectious vaginitis. *Dermatologic therapy*, 2004; 17:102-110.
- 3-Jarecki-Black, J. C.; Lushbaugh, W. B; Golosov, I and classman. *Trichomonas vaginalis* preliminary characterization of sperm motility inhibiting factor. *Ann. clin. Lab. Sci.*, 1988; 18:484 -489.
- 4-Thomson, J. T. and Gelbart, S.M. *Trichomonas vaginalis* obstet. *Gynecol.*, 1989; 47:536-541.
- 5-Soble, J.D. Vulvo vaginal candidosis. *Lancet*, 2007; 369: 1961-1971.
- 6-Morse, S.A. *Neisseria, Moraxella, Kingella* and *Eikenella*. *Med. Micro. ch.*, 2002; 14. [Internet].
- 7-Lawing, L.F.; Hedges, S.R. & Schwebke, J.R. Detection of trichomoniasis in vaginal and urine specimens from women by culture and PCR. *J. Clin. Microbiol.* 2000; 38:3585-308.
- 8- Finegold, S. M. and Baron, E.J. Diagnostic Microbiology Baily and scott. 7th edition, 1986, p. 97, 391.
- 9-Ledeger, W.J.; Larso, R. K; Mattox, J.H. *Obstertric and Gynecology*. 8th edition C.V. Mosby company.Ch, 1987; p. 621.
- 10-Kent, H. L. Epidemiology of vaginitis. *Am. J. Obstet. gynecol.*, 1991; 165 (2): 1168- 76.
- 11- Krieger, J.N.; Tam, M.R.; Sterens, C.; Nielsen, IO.; Hale J; Kiviat , N.B. and Homles, K. K. Diagnosis of Trichomoniasis. *JAMA*, 1988; 259(8):1223-27.
- 12-Fonts, A.C. and Kraus, S.J. *Trichomonas vaginalis*.re-evaluation of its clinical presentation and Laboratory diagnosis. *JAMA*, 1980; 141(2):137-142.
- 13-Calman, K. The health of nation. *Br. J. Hosp>Med.*; 1996; 56:125-6.
- 14-Petrin, D.; Delgaty, K.; Bhatt, R. and Garber, G. Clinical and microbiology aspects of *Trichomonas vaginalis*. *Clin. Microbial. Rev.*, 1998; 11(2):300-17.
- 15-Reynolds, M. and Wilson, J. Is *Trichomonas vaginalis* still marker for other sexually transmitted infection in women? In: *J. STD. ADIS*. 1996; 7(12):131-2.
- 16- Laga, M.; Manoka, A.; Kivuvu, M. Non-ulcerative STDs as a risk factor for HIV-1 Transmission in women. *AIDS*, 1993; 7:95-102.
- 17- Sorvillo, F. and Kerndt, P. *Trichomonas vaginalis* and amplification of HIV-T transmission. *Lancet*, 1998; 351:213-14.
- 18-Klebanoff, M.A.; Coray, J.C.; Hauth, J.C.; Hillier, S. L. and Nugent; R.; Leveno, K. J.; Miodovnik, M.; sibai; B.M. Failure of metronidazole to prevent preterm delivery Among pregnant women with asymptomatic *Trichomonas vaginalis* infection. *N. Eng. J. Med.*, 2001; 345(7):487-93.
- 19- Cram, L.F.; Zapata, M.I. and Toy, E.C. Genitourinary infection and their association with preterm Labor. *Am. Fam. physi.* 2002; 65:241-8.
- 20-Zhang, A.F.; Graham, S.; Yu, S.Z. *Trichomonas vaginalis* and cervical cancer. A practical prospective study in china. *Ann Epidem.*, 1995; 5:325-32.

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