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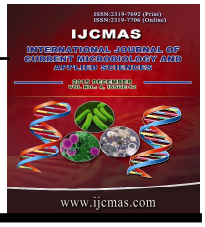

Original Research Article

Prevalence of *Trichomonas vaginalis* Infection in Women of Reproductive Age Group

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Keywords

Trichomonas vaginalis, Reproductive Age Group, trichomoniasis

A B S T R A C T

Trichomonas vaginalis is a flagellated parasite, causes sexually transmitted infections mainly in women. It is usually found with other sexually transmitted infections such as Chlamydia, Gonorrhoea, Syphilis and Herpes simplex virus type II and is a sensitive marker of highly sexual behaviour. It causes pelvic inflammatory disease and adverse pregnancy outcomes. Hence this study is carried out to know the prevalence of *Trichomonas vaginalis* infection by various laboratory diagnostic tests. A cross sectional study was conducted on 135 women complaining of vaginal discharge. Vaginal swabs were collected and examined microscopically by wet mount, culture and Pap smear examination. Out of 135 patients *Trichomonas vaginalis* was identified in 26(19.25%) by wet mount and Pap smear examination. By culture Trichomonas was identified in 30 cases (22.22%). Majority of the women were with infection was in the age group of 31-35 years. Trichomonas infections were seen in 22% of women in reproductive age group. Culture was the gold standard method than wet mount examination. Pap smear examination was also equally effective as wet mount. As Trichomonas infection indicates other sexually transmitted infections so is better to test other infections also in reproductive age.

Introduction

Trichomonas vaginalis (TV) infection is the most prevalent non-viral sexually transmitted infection (STI) in adolescents (Weinstock H et al 2000). It was first described as a venereal disease in the mid-20th century even before Chlamydia trachomatis infection was recognised.

Trichomonas vaginalis is an anaerobic parasite, flagellated protozoan and is the causative agent of trichomoniasis and is estimated around 180 million infections acquired worldwide annually (Shira CS et al 2006 and WHO 2004)

Human beings are known to be the best hosts where the trophozoites are transmitted mainly through vaginal sexual intercourse and rarely through fomites (Wikerson RG et al). *Trichomonas vaginalis* infects the genitourinary tract and causes the sexually transmitted disease in sexually active women of all age groups (Schwebke JR et al 2004).

The prevalence of trichomonas depends on factors such as age, sexual activity and also number of sexual partners.

In women the disease shows a variety of symptoms ranging from severe inflammation and irritation with frothy discharge to a relatively asymptomatic carrier state. But the main clinical manifestation of trichomonas is vaginitis, urethritis (Whittington JM et al 1957). Trichomonas infection has been associated with pelvic inflammatory disease, low infant birth weight and premature delivery and untreated infection can persist up to 5 yeas (Catch MF et al 1997 and KlausnerJD et al 1997). The organism has been shown to increase transmission and acquisition of other sexually transmitted disease including HIV 9, 10. *Trichomonas vaginalis* is usually found along with other STIs including Chlamydia, gonorrhoea, syphilis and herpes simplex virus type -2 and is considered a sensitive marker of high-risk sexual behaviour (Chan L et al 1996, Hook EW et al 1999 and Krieger JN et al 1999).

Vaginal trichomoniasis is associated with a yellow or green and sometimes frothy discharge. Differential diagnosis requires a thorough history that includes vulvo-vaginal examination and simple laboratory tests like microscopy of the vaginal discharge (Cullins VA et al 1999).

It has been reported that *Trichomonas vaginalis* causes discomfort and psychosocial distress in the infected patients. Trichomonas has also been reported to be a major cause of pathology in obstetrics and gynaecology. Complication in pregnant women due to trichomonas infection include post abortion infection, post caesarean infection, preterm birth, low birth weight infants and preterm labour (Graves A et al 1993).

The infection has been suggested as a risk factor for developing cervical neoplasia (Khurana S et al 2005). Other complications caused by the organism include pelvic inflammatory disease and tubal infertility, vaginitis and urethritis (Cherpes TL et al 2006). In males it is usually found in the urethra, prostrate or epididymis causing urethritis and prostratitis (Swygard H et al 2004)

Identifying the source of this infection is challenging as a large number of pathogens can cause vaginal and cervical infection and many other infections may co-exist. Useful tests for etiological diagnosis include pH analysis of vaginal fluid, the “Whiff test”, wet mount examination, culture and Gram’s stain (Fox KK et al 1994).

Direct examination of wet mount preparation of clinical specimen is the most rapid, and less expensive technique for identifying *Trichomonas vaginalis* (Alcamo IE 2000). The broth culture technique is more sensitive and valuable when the organisms are few in number. Culture using vaginal specimens is the gold standard (Fouts AC et al 1980 and Borchardt K et al 1991).

We have undertaken the present study to determine the prevalence of trichomonas among the screened population by wet mount, culture and papanicolaou (pap) smear.

Materials and Methods

A cross sectional study was conducted on 135 women complaining of itching, pain and vaginal discharge attending the department of Obstetrics and Gynaecology in a tertiary care hospital. Vaginals wabs were collected from those patients and were processed for the detection of *Trichomonas vaginalis*.

Institutional ethical committee clearance was obtained and informed consent from the individuals was taken. The inclusion criteria were women of reproductive age group i.e. 20-45years with excessive vaginal discharge, genitourinary symptoms and lower abdomen pain. None of them revealed their sexual history (STDs, multiple partners).

Collection of Specimen

Samples were collected from the patients in the dorsolithotomy position by using a sterile single use bivalve speculum which was inserted into the vagina without lubricant. The secretions from the vaginal canal were collected with a swab and a speculum. With the help of the spatula the sample was collected by rotating 360^0 around the circumference of the cervical Os, retaining the sample on the upper surface of the spatula. Smears were made and sent to department of Pathology for Papanicolaou stain. Along with it two swabs of vaginal discharge were also collected one each for wet mount and culture.

Wet Mount

A drop of saline was placed on a clean grease free slide. The sample was emulsified on it and a coverslip was placed over it. Microscopic observation was done under low power (10x) objective and later under high power (40x) objective. A positive wet mount was confirmed when pear shaped organisms with whip like motility were observed.

Culture

The second swab was used for culture. The sab was transported immediately within one hour by using Stuart's transport medium. (Hi media laboratories Pvt ltd, Mumbai, India).it was then transferred into the trichomonas Hi veg agar base along with Trichomonas selective supplement II (Hi media, India). This was incubated at 25^0C for five successive days and wet mounts were made from culture and observed daily for motile organisms.

Results and Discussion

A total of 135 women of the reproductive age were included in the study. *Trichomonas vaginalis* infection was detected by wet mount preparation, Pap smear examination and by culture.

Out of 135 patients, *Trichomonas vaginalis* was identified in 26 (19.25%) patients in microscopic examination by wet mount (figure 2). Pap smear examination (figure 1) also showed trichomonas infection in 26 (19.25%)and 30 (22.22%) were culture positive. (Table1). Out of these 30 positive cases, 28 women were from rural areas and 2 were from urban areas.

The average age group of women in the study group was 20-45y with a mean of 32 years. All women were married and none of them revealed their history of sexual behaviour. Age group distribution is shown in table 2.

A p value less than 0.05 was considered significant ($p<0.05$).

A total number of 135 women in the reproductive age from 20-45 y were evaluated for the presence of *Trichomonas vaginalis* infection with clinical complaints of itching and burning, lower abdominal pain and excessive vaginal discharge.

In our study three methods were used to detect trichomonas infection – wet mount, culture and Pap smear examination. In wet mount examination 26 (19.25%) were positive. Pap smear was positive in

26(19.25%) and culture was positive in 30(22.22%). The results are statistically significant with p value <0.05.

In one study by Abdulsadah AR et al showed 20% positive cases of *Trichomonas vaginalis* infection (Abdulsadah A. Rahi et al 2014). Similar results were observed by wet mount preparation in Baghdad (38.5%) (Al-Luaibi Raghad KO et al 2005), Najaf (20.4%) (Al-Zabedy SWK 2004), Babylon (20%) (Ali AQM 2014) and Mosul (15.5%) (Al-Habib HM et al 2005). Out of 30 culture positive cases 40% were in the age group of 31-35y, 23.3% were in the age group of 41-45y and 16.6% were in the age group of 20-25y. In one study by Jatau et al the infection was prevalent in the 16-25y age group (53.57%), followed by 26-35y age group (32.14%) (Jatau ED et al 2006).

In one study by Bansal R et al in his three years study observed that over all prevalence was 6.1% with prevalence of 7.24% in 2010, 5.1% in 2011 and 7.14% in 2012 respectively (Bansal R et al 2013) In India it is reported that symptomatic patients vary between 4.8-7.08%. The reason for variable prevalence may be due to the socio demographic profile of the patient and the methods used for isolation of the organism.

The prevalence rate according to age in different areas is as follows.

In Nigeria the prevalence was 2.6% in the women of age 15-64y (Abdulazeez A et al 2007). In china it was 2.9% in the age of 36-40y 10.in Palestinian women it was 18.2% in the age group of 16-50y (Abdolalichalechale et al 2006). In another study by Madeline S et al a high prevalence was observed in the age group of 14-49y (Madeline S et al 2007).

The prevalence of *Trichomonas vaginalis* infection in different age groups is variable and it was also observed that infections are more in aged population. The increased prevalence in older women may be due to long term infection which might have not been diagnosed earlier.

In our study culture was positive for 22.22% cases which show that culture is more sensitive than microscopy.

In one study by Jatau E D et al microscopy by wet mount was positive in 6.66% cases and culture was positive in 18.66 % (Jatau ED et al 2006).

In one study by Beverly et al showed that wet mount preparation is only 35.85% sensitive compared to culture (Beverly AL et al 1999). In one study by Seema sod et al 45% more positive cases were detected by culture than wet mount and sensitivity of wet mount was observed to be 55 % (Sood S et al 2008).

Because of the limitations of wet mount, culture remains the most accurate method for detecting Trichomonas infection.

In our study we have also correlated our microscopic results with Pap smear from Department of pathology which showed 19.5% positivity which is equally as sensitive as wet mount.

Since *Trichomonas vaginalis* is a common sexually transmitted pathogen, the screening and treatment of sex partners of infected women must be also be done as a public health measure to prevent reinfection and reduce infection rates and complications in males. (Bowden FJ et al 2000 and Watt L 1960). The limitation of our study of 22.22% is not applicable to general population as we could not elicit the sexual history of our study group and more population has to be studied.

Table.1 Showing Result in Three Methods

Method	Positive	Negative
Wet mount	26(19.25%)	109
Pap smear	26(19.25%)	109
Culture	30(22.22%)	105

P<0.05

Table.2 Showing Age Wise Distribution

AGE	POSITIVE	NEGATIVE
20-25	05	19
26-30	04	22
31-35	12	36
36-40	02	11
41-45	07	17
Total	**30**	**105**

Figure.1 Pap Smear of *Trichomonas Vaginalis*

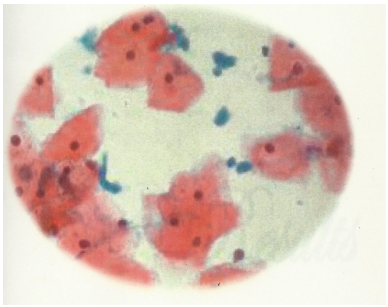
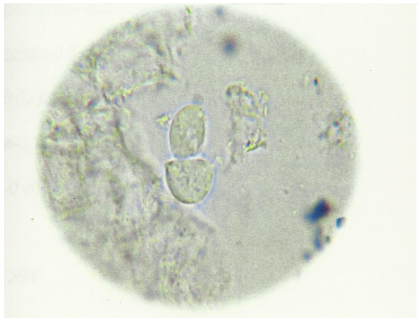


Figure.2 Wet Mount of *Trichomonas Vaginalis*



In conclusion, the overall prevalence of *Trichomonas vaginalis* infection in reproductive age group was 22.2% and the mean age of women is 32years. Majority of the women were from rural areas. Though wet mount is cheap and easily available method for detection it has its own limitations. It can be correlated with Pap smear examination to some extent.

As culture is the gold standard method, all the wet mount negative samples also are to be tested by culture which will increase the rate of detection of the protozoan. Introduction of molecular methods such as PCR is also helpful. As detection of *Trichomonas vaginalis* infection is an indicator of other sexually transmitted infections, it is better to test for all the sexually transmitted infections in the women of reproductive age group. There is a need for counselling, effective screening programmes, providing treatment for infected partners and creating awareness in the population about this infection and its mode of transmission.

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