Detection of *Trichomonas vaginalis* by different methods in women from Dohok province, Iraq

W.M. Al-Saeed¹

ABSTRACT This study compared 4 different diagnostic methods for the detection of *Trichomonas vaginalis* in vaginal swab specimens from women attending a hospital in Dohuk in Iraq. A total of 425 vaginal swabs were obtained from women complaining of vaginal discharge associated with vaginitis, cervicitis and pelvic inflammatory disease. The results showed that 10 (2.4%) swabs were positive for *T. vaginalis* by wet smear preparation, 15 (3.5%) by haematoxylin–eosin stained smear, 17 (4.0%) by Papanicolaou stain and 23 (5.4%) using Diamond modified culture. The rate varied significantly by age and was highest in young women aged 20–25 years (7.6%) and lowest in the age group 36–40 years (2.2%). The highest rate of infection with *T. vaginalis* was detected by Diamond modified culture.

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Introduction

Trichomonas vaginalis is a sexually transmitted, flagellated protozoan that causes vaginal infections in women, including vaginitis, urethritis and cervicitis [1]. T. vaginalis infections are not self-limiting and produce non-ulcerative inflammation of the genital epithelium that can progress to necrosis and haemorrhage [2,3]. Pregnant women infected with T. vaginalis may be at increased risk of premature labour, low-birth-weight offspring and postabortion or posthysterectomy infection [4–6].

It has been estimated that 10% to 50% of T. vaginalis infections in women are asymptomatic [7], and in men the proportion may even be higher. The most common tool for diagnosis of T. vaginalis infection is still microscopic examination of wet mount preparations, which has a sensitivity of approximately 60% [8]. Microscopic examination of cultures of the parasite in specialized media improves the sensitivity to 85% [9–11]. The most sensitive test for diagnosis is the modified Diamond medium which has a sensitivity of approximately 95% [9–11], although slow. The most sensitive of these media is thought to be modified Diamond medium [9,10]. Direct microscopic examination of vaginal secretions is the most common and rapid method used to diagnose trichomoniasis. Treatment of vaginal and urethral specimens is the most sensitive, although slower, diagnostic technique [11,12].

This study compared 4 different diagnostic methods for the detection of T. vaginalis in vaginal swab specimens obtained from women attending a hospital in Dohuk in Iraq.

Methods

Sample and data collection

The study sample was 425 female patients attending the department of gynaecology of Azadi hospital in Dohok province between October 2006 and June 2007 with complaints of vaginal and cervical infection. Two cotton swab specimens were obtained from the posterior vaginal fornix of all patients. The swabs were inserted into the pooled vaginal secretions touching both fornices and the middle third of the vaginal wall.

Laboratory methods

All swabs from the women were examined using 4 different laboratory methods. The first swab was used to produce a wet mount after mixing with normal saline for direct microscopic examination. Another 2 smears done from the first swab were fixed with 70% ethanol for further staining with Papanicolaou and haematoxylin–eosin stains [13,14]. A second swab specimen was immediately placed in 10 mL of Diamond modified medium (Dickinson Microbiology Systems).

Results

Of 425 women complaining of vaginal secretions, vaginitis, cervicitis and pelvic inflammatory disease, 23 (5.4%) showed the presence of T. vaginalis in the specimens examined by different diagnostic methods. T. vaginalis were detected in 10 (2.4%) of the total by wet smear preparation, 15 (3.5%) by haematoxylin–eosin stained smear, 17 (4%) by Papanicolaou stain and 23 (5.4%) in specimens cultured using modified Diamond culture method (Table 1).

Table 1 shows the frequencies of infection with T. vaginalis in different age groups and using different diagnostic methods. The rate varied significantly

<table>
<thead>
<tr>
<th>Test</th>
<th>No. of infected women</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet smear</td>
<td>10</td>
<td>2.4</td>
</tr>
<tr>
<td>H&amp;E stain</td>
<td>15</td>
<td>3.5</td>
</tr>
<tr>
<td>Pap. stain</td>
<td>17</td>
<td>4.0</td>
</tr>
<tr>
<td>Modified Diamond culture</td>
<td>23</td>
<td>5.4</td>
</tr>
</tbody>
</table>

H&E = haematoxylin–eosin; Pap = Papanicolaou.
by age and was highest in young women aged between 20–25 years (7.6%) and lowest in the age group 36–40 years (2.2%).

### Discussion

*T. vaginalis* infections are regarded as the most prevalent non-viral sexually-transmitted disease (STD) and are similar to other STDs in that the prevalence increases with increased numbers of sexual partners, presence of other STDs (especially gonorrhoea) and failure to use barrier contraceptives [12].

In the current study wet smear preparation detected the fewest number of infections with *T. vaginalis* (2.4%), followed by haematoxylin–eosin stain (3.5%) and Papanicolaou stain (4.0%). The modified Diamond culture detected the highest rate of infection (5.4% of specimens). In most settings the microscopic evaluation of vaginal discharge (wet preparation) has been the standard method used to diagnose *T. vaginalis* infections. The wet preparation is fast and convenient for clinicians and is inexpensive, but in asymptomatic women the sensitivity of the wet preparation in demonstrating motile trichomonads (definitive diagnosis) is only 60% to 80% [12]. Other stains, such as haematoxylin–eosin and Papanicolaou have better sensitivities but are more labour-intensive and take time during processing of the stain and are moderately expensive [11]. Diamond’s modified medium has been shown to be the most sensitive medium for the culture of *T. vaginalis* [9–11], possibly due to the starch content of the medium which gives similar environmental conditions as the vaginal epithelium [13]. However, the method needs as long as 3–7 days for confirmation of the diagnosis and is expensive when compared with previous methods.

Overall 5.4% of women complaining of vaginal and cervical infection were found to be infected with *T. vaginalis*. This rate is consistent with another study in Iraq in Kirkuk (7.5%) [14], but disagrees with similar studies done in Erbil (10%) and in Mosul (14%) [15,16]. The lower rate found in our study might be due to the women using vaginal washing and antiseptics after coitus with their partners or to the existence of health education programmes about STDs arranged by the maternal care office. The rates in this study and others in the Iraq, however, are lower than that reported in some other counties. The rate of infection in a hospital study New York city was reported as 41.3%, and in a community study in South Africa as 41% [17].

The highest incidence of *T. vaginalis* was found in the age group 20–30 years, which is in agreement with Al-Samarrae’s study in Iraq [18], and may be related to the greater sexual activity of this age group.

In conclusion, the highest rate of infection with *T. vaginalis* was detected by Diamond modified culture.

### References


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**Sexually Transmitted Diseases Diagnostics Initiative**

The Sexually Transmitted Diseases Diagnostics Initiative (SDI) was founded in 1990 in response to a widely-perceived need to improve care for patients with sexually transmitted infections (STIs) in resource-limited settings through improved diagnostics. It is estimated that 80%–90% of the global burden of STIs occurs in the developing world where there is limited or no access to diagnostics. SDI aims to promote the development, evaluation and application of diagnostic tests for STIs appropriate for use in primary health care settings in developing countries. Further information about SDI can be found at: http://www.who.int/std_diagnostics/index.htm